

## East Meath - North Dublin Grid Upgrade Environmental Impact Assessment Report (EIAR): Volume 2

Chapter 6 – Human Health

EirGrid

March 2024



## Contents

<b>6.</b>	<b>Human Health.....</b>	<b>1</b>
6.1	Introduction.....	1
6.2	Methodology.....	2
6.2.1	Study Area.....	2
6.2.2	Relevant Guidelines, Policy and Legislation.....	2
6.2.3	Data Collection and Collation.....	4
6.2.4	Appraisal Method for the Assessment of Impacts.....	4
6.3	Baseline Environment.....	12
6.3.1	Population and Sociodemographics.....	12
6.3.2	Health Profile.....	13
6.3.3	Open Space, Leisure and Recreation.....	17
6.3.4	Employment and Income.....	17
6.3.5	Transport Modes, Access and Connections.....	18
6.3.6	Air Quality.....	19
6.3.7	Noise and Vibration.....	19
6.3.8	Vulnerable Groups and Sensitive Locations.....	20
6.3.9	Sensitivity of Populations.....	20
6.4	Potential Impacts.....	21
6.4.1	'Do Nothing' Scenario.....	21
6.4.2	Construction Phase.....	21
6.4.3	Operational Phase.....	25
6.5	Mitigation and Monitoring Measures.....	25
6.5.1	Construction Phase.....	25
6.5.2	Operational Phase.....	26
6.6	Residual Impacts.....	27
6.6.1	Construction Phase.....	27
6.6.2	Operational Phase.....	30
6.7	Conclusion.....	30
6.8	References.....	30

## 6. Human Health

### 6.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) has considered the likely potential human health impacts associated with the Construction and Operational Phases of the East Meath - North Dublin Grid Upgrade (hereafter referred to as the Proposed Development). A full description of the Proposed Development is presented in Chapter 4 (Proposed Development Description) in Volume 2 of this EIAR.

This assessment uses the World Health Organization (WHO) definition of health which reflects that health is determined by a complex interaction between individual characteristics, lifestyle and the physical, social and economic environment. These 'wider determinants of health' can have a greater influence than medical healthcare for ensuring a healthy population (WHO 2022). Diagram 6.1 provides a conceptual illustration of the wider determinants of health.

A concept of key importance to public health is the issue of health inequalities which refers to the:

*"avoidable gap in health outcomes between those at the top and bottom ends of the social class or socioeconomic classification scale... People in higher socioeconomic groups are more likely to live longer and enjoy more years of good health than those in lower socioeconomic groups. There are also notable differences in the health experiences of men and women. Health inequalities and social inequalities are closely linked" (Pyper et al. 2021).*

Addressing the wider determinants of health is seen as an important means of tackling social inequalities of health and improving population health as a whole. The aim of this assessment is therefore to identify the wider determinants of health that would likely be affected by the Proposed Development, which population groups would be affected, and whether these impacts could be associated with changes to health outcomes of that population.

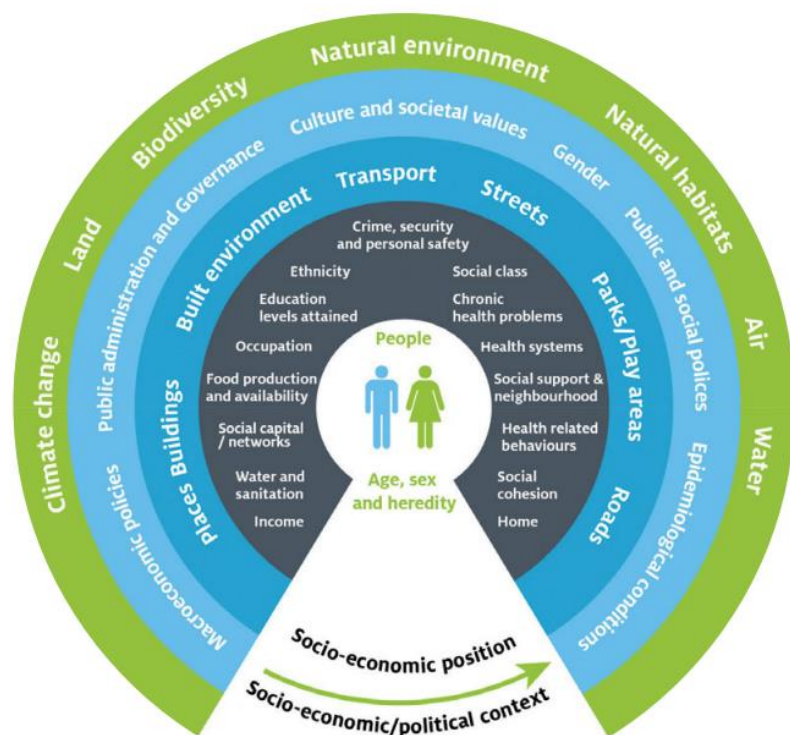


Diagram 6.1: Wider Determinants of Health (From 'Healthy Ireland' (Department of Health 2013), Developed from Barton and Grant (2006) and Dahlgren and Whitehead (1991))

## 6.2 Methodology

### 6.2.1 Study Area

The study area (see Figure 6.1 in Volume 4 of this EIAR) is defined as all small areas (i.e., a Central Statistics Office (CSO) administrative unit generally covering 50 to 200 households and which are generally comprised of complete townlands or neighbourhoods (CSO n.d.) which intersect (i.e., fall within or partially within) the Planning Application Boundary for the Proposed Development. This study area is considered sufficient to capture the exposure pathways of the Proposed Development such as construction noise and air pollution, as well as encompassing any impacts on land use. Beyond this distance there is no likelihood of exposure to significant noise or air pollution impacts from the Proposed Development, and the intervening distance and land use is likely to reduce the physical and psychological influence of the Proposed Development on local communities, and therefore based on professional judgement, no significant impacts on human health are anticipated.

### 6.2.2 Relevant Guidelines, Policy and Legislation

Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (hereafter referred to as the EIA Directive) replaced the factor 'human beings' with 'population and human health' to clarify the requirement to consider human health in Environmental Impact Assessment (EIA). The EIA Directive is transposed into Irish law via S.I. No. 296/2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

In terms of policy, Healthy Ireland – A Framework for Improved Health and Wellbeing 2019 – 2025 (hereafter referred to as the Healthy Ireland Framework) (Department of Health 2019) provides a roadmap for building a healthier Ireland. The policy framework is based around the following four goals:

- To increase the proportion of people who are healthy at all stages of life;
- To reduce health inequalities;
- To protect the public from threats to health and wellbeing; and
- To create an environment where every individual and sector of society can play their part in achieving a healthy Ireland.

The Healthy Ireland Framework recognises the importance of intersectoral collaboration (for example involving the health, transport, education, planning, business sectors) to address the social, environmental and economic determinants of health required for health improvement and protection. This assessment has, therefore, taken account of the policy goals when considering the potential significance of the Proposed Development in terms of health improvement, reducing health inequalities, health protection, and creating an environment that supports a healthy society.

The following guidelines have informed the interpretation of the human health factor in EIA and the overall approach to this assessment:

- Environmental Impact Assessment of Projects. Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission 2017);
- Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA Guidelines) (EPA 2022);
- Human Health: Ensuring a High Level of Protection. A reference paper on addressing Human Health in Environmental Impact Assessment (hereafter referred to as the IAIA and EUPHA Guidance) (International Association for Impact Assessment (IAIA) and European Public Health Association (EUPHA) 2020);
- Institute of Public Health Ireland (IPH) Health Impact Assessment Guidance for Ireland and Northern Ireland (Pyper *et al.* 2021);
- Institute of Environmental Management and Assessment (IEMA) Guide to: Effective Scoping of Human Health in Environmental Impact Assessment (IEMA 2022a);
- IEMA Guide to: Determining Significance for Human Health in Environmental Impact Assessment (IEMA 2022b);
- Environmental Noise Guidelines for the European Region (hereafter referred to as the World Health Organisation (WHO) Noise Guidelines) (WHO 2018); and
- WHO Global Air Quality Guidelines: Particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide (WHO 2021).

The European Commission's Guidance on the Preparation of the Environmental Impact Assessment Report notes that 'human health is a very broad factor' that is 'highly project dependent'. It states that:

*"The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study."* (European Commission 2017)

This assessment recognises that human health is interrelated with several other environmental factors. The assessment has sought to identify the potential changes to emissions, health risks, the built environment and traffic that could be caused by the Proposed Development, and how these changes may in turn be associated with health outcomes.

The EPA Guidelines state that:

*"The evaluation of effects on these pathways is carried out by reference to accepted standards (usually international) of safety in dose, exposure or risk. These standards are in turn based upon medical and scientific investigation of the direct effects on health of the individual substance, effect or risk. This practice of reliance upon limits, doses and thresholds for environmental pathways, such as air, water or soil, provides robust and reliable health protectors [protection criteria] for analysis relating to the environment."* (EPA 2022)

This assessment has therefore taken account of the relevant guidelines on limit values and thresholds which are listed in the following Chapters within Volume 2 of this EIAR:

- Chapter 7 (Air Quality);
- Chapter 9 (Noise and Vibration); and
- Chapter 11 (Soils, Geology and Hydrogeology).

Information about the health status of communities has been obtained from various sources such as the CSO, Lenus (a central source for open access health research in Ireland), the Health Service Executive (HSE) and the IPH. Evidence for associations between health outcomes and certain determinants has been drawn from a wide range of published health literature and is referenced throughout the assessment.

### **6.2.3 Data Collection and Collation**

This assessment has been informed by desk-based data collection only. No survey work has been undertaken. The following sources of data are referenced throughout Section 6.3.

- CSO small area Census 2022 statistics (CSO 2022);
- 2022 Pobal HP deprivation index data for electoral divisions (Pobal 2023);
- County health profiles for Dublin City, Fingal and County Meath (HSE 2016);
- Ordnance Survey Ireland (OSI) mapping (OSI);
- Aerial imagery on Geographic Information System (GIS) platform used for the Proposed Development;
- GeoDirectory Address Data Information (An Post and Tailte Éireann 2023); and
- Additional data sources as identified in Chapter 5 (Population), Chapter 7 (Air Quality), Chapter 9 (Noise and Vibration), Chapter 14 (Traffic and Transport) and Chapter 15 (Agronomy and Equine) in Volume 2 of the EIAR.

### **6.2.4 Appraisal Method for the Assessment of Impacts**

#### **6.2.4.1 General Approach to the Human Health Assessment**

A desk-based study of the available data was undertaken to identify the populations of interest and to characterise them in terms of their population size, socio-economic status, burden of disease and the distribution of those existing factors.

Baseline data from the assessments of other chapters in this EIAR was then reviewed to understand baseline determinants of health. Information on air pollution levels and existing noise was obtained from Chapter 7 (Air Quality) and Chapter 9 (Noise and Vibration) in Volume 2 of this EIAR, respectively. Other relevant information on access to community and health facilities, facilities used for outdoor recreation, land use and local economic conditions were obtained from Chapter 5 (Population) in Volume 2 of this EIAR. Information on walking and cycling facilities and existing traffic patterns were obtained from Chapter 14 (Traffic and Transport) in Volume 2 of this EIAR. These were considered the most relevant aspects of the environment to understand in terms of human health.

Consultation is identified as an important part of the health assessment process as identified within the IPH Guidance (Pyper *et al.* 2021) and Effective Scoping of Human Health in Environmental Impact Assessment (IEMA 2022a). External stakeholder consultation is described within Section 1.6 of Chapter 1 (Introduction and the Environmental Impact Assessment Process) in Volume 2 of this EIAR, and internal stakeholder consultation has been ongoing throughout outline design development. This approach is considered proportionate for the nature of the Proposed Development.

The overall approach to the human health assessment is illustrated in Diagram 6.2.

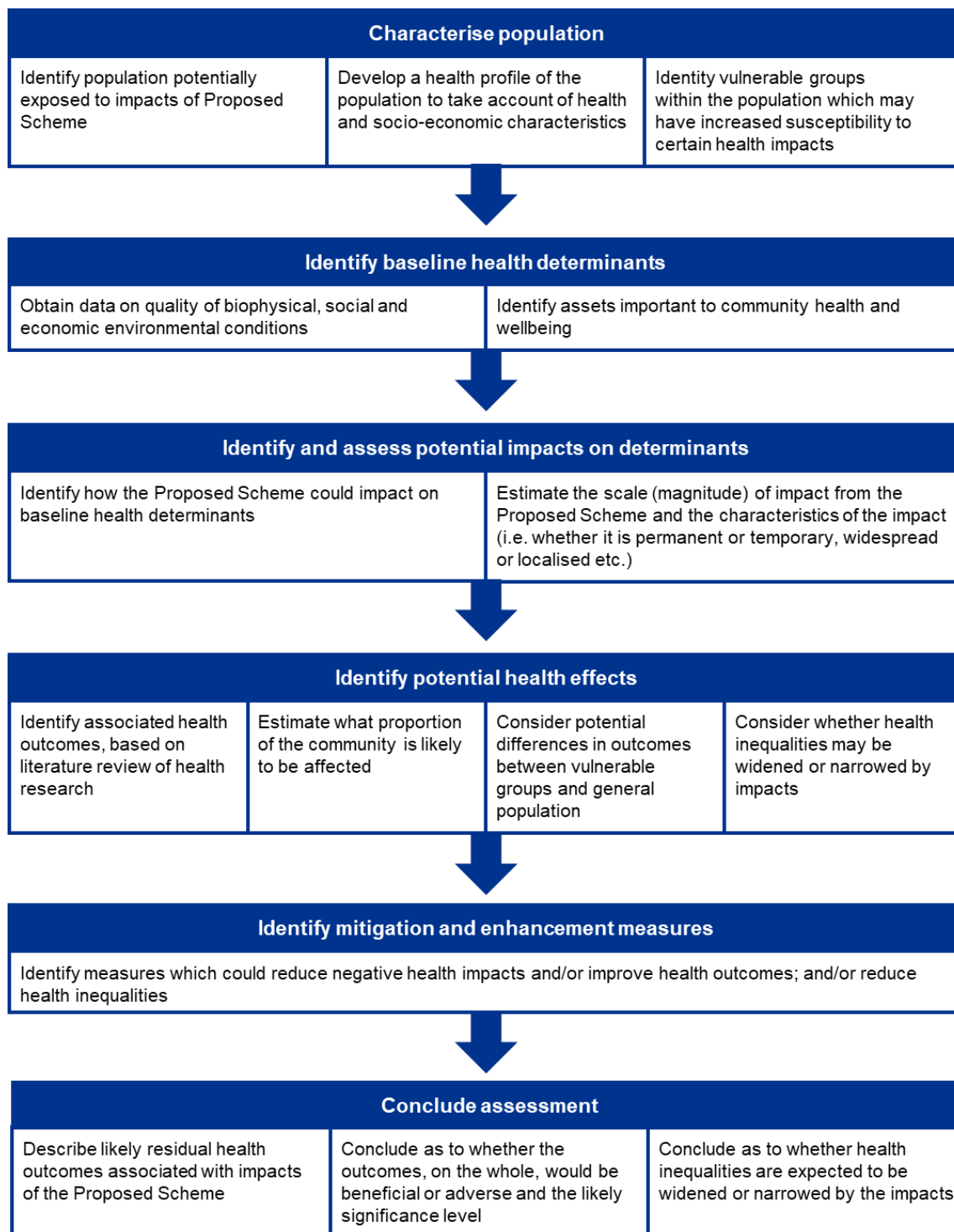


Diagram 6.2: Approach to the Human Health Assessment (Source: Jacobs 2024)

### 6.2.4.2 Scoping of Health Assessment

The scoping assessment provided in Appendix A6.1 in Volume 3 of this EIAR identifies health determinants and confirms which are considered to potentially be affected by the Proposed Development, and are therefore scoped in for further assessment, or which have been scoped out. Table 6.1 lists the determinants that have been scoped into the health assessment.

**Table 6.1: Summary of Health Scope**

Determinant	Scoped into Assessment?	
	Construction Phase	Operational Phase
Open space, leisure and recreation	Yes	Yes
Transport modes, access and connections	Yes	No
Employment and income	Yes	No
Air quality	Yes	No
Noise and vibration	Yes (noise only)	No

Electromagnetic Fields (EMFs) surround any object that is generating, transmitting or using electricity, including appliances, wiring, office equipment, batteries and any other electrical devices. Therefore, EMFs are common in modern life. EMFs are invisible and cannot be felt or heard. In many cases, domestic electrical appliances and tools can generate much higher magnetic and electric fields, if in close proximity to a sensitive receptor, than transmission lines at standard separation distances. EirGrid designs, develops and operates the transmission grid in accordance with stringent safety recommendations which are made by national and international agencies. Several of these recommendations come from the International Council on Non-Ionising Radiation Protection (ICNIRP). This is an independent body, funded by public health authorities around the world. ICNIRP has reviewed the safety of EMFs and recommended limits on exposure that are far below levels where adverse effects might occur. Electricity cables have been placed underground in Ireland since the 1960s. There are currently approximately 320 kilometres (km) of underground transmission cables in Ireland, with multiples of this figure of underground cabling associated with the lower-voltage distribution system. Given that EirGrid design standards require all electricity infrastructure to operate under existing public exposure guidelines from ICNIRP, there would be no direct impact on human health from EMFs. As a result, they are scoped out of further assessment within this Chapter, as no significant impacts on health as a result of exposure to EMF are considered likely.

### 6.2.4.3 Approach to Judgement of Significance

The health determinants from the Healthy Ireland conceptual illustration (see Diagram 6.1) and Annex 2 of the IEMA Guide to Effective Scoping of Human Health in Environmental Impact Assessment (IEMA 2022a) were considered in relation to their potential relevance to the Proposed Development. The key considerations made for each health determinant, and reasons for why they have been scoped in or out of the assessment are documented in Appendix A6.1 in Volume 3 of this EIAR.

Each assessment of health impact includes a narrative to explain the sensitivity of the population groups affected, guided by the criteria outlined in Table 6.2.



**Table 6.2: Human Health Sensitivity Criteria**

Level	Indicative Criteria*
High	<ul style="list-style-type: none"> <li>• High levels of deprivation (including pockets of deprivation);</li> <li>• Reliance on resources shared (between the population and the project);</li> <li>• Existing wide inequalities between the most and least healthy;</li> <li>• A community whose outlook is predominantly anxiety or concern;</li> <li>• People who are prevented from undertaking daily activities;</li> <li>• Dependents;</li> <li>• People with very poor health status; and / or</li> <li>• People with a very low capacity to adapt.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>• Moderate levels of deprivation;</li> <li>• Few alternatives to shared resources;</li> <li>• Existing widening inequalities between the most and least healthy;</li> <li>• A community whose outlook is predominantly uncertainty with some concern;</li> <li>• People who are highly limited from undertaking daily activities; people providing or requiring a lot of care;</li> <li>• People with poor health status; and / or</li> <li>• People with a limited capacity to adapt.</li> </ul>
Low	<ul style="list-style-type: none"> <li>• Low levels of deprivation;</li> <li>• Many alternatives to shared resources;</li> <li>• Existing narrowing inequalities between the most and least healthy;</li> <li>• A community whose outlook is predominantly ambivalence with some concern;</li> <li>• People who are slightly limited from undertaking daily activities;</li> <li>• People providing or requiring some care;</li> <li>• People with fair health status; and / or</li> <li>• People with a high capacity to adapt.</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>• Very low levels of deprivation</li> <li>• No shared resources; existing narrow inequalities between the most and least healthy;</li> <li>• A community whose outlook is predominantly support with some concern;</li> <li>• People who are not limited from undertaking daily activities;</li> <li>• People who are independent (not a carer or dependent);</li> <li>• People with good health status; and / or</li> <li>• People with a very high capacity to adapt.</li> </ul>
Adapted from the IEMA Guide to: Determining Significance for Human Health in Environmental Impact Assessment (IEMA 2022b) with categories of sensitivity aligned to EPA Guidelines (EPA 2022) terminology. * Judgement based on most relevant criteria - some criteria will span categories	

The magnitude criteria presented in Table 6.3 have also been adapted from the IEMA Guide to: Determining Significance for Human Health in Environmental Impact Assessment (IEMA 2022b). Long term (15 years or greater), medium term (7 to 15 years), short term (1 to 7 years) and temporary (less than 1 year) effects are defined as per the EPA Guidelines (EPA 2022).

**Table 6.3: Human Health Magnitude Criteria**

Level	Indicative criteria*
High	<ul style="list-style-type: none"> <li>• High exposure or scale;</li> <li>• Medium to long-term duration;</li> <li>• Continuous frequency;</li> <li>• Severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness / injury outcomes;</li> <li>• Majority of population affected;</li> <li>• Permanent change; and</li> <li>• Substantial service quality implications.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>• Low exposure or medium scale;</li> <li>• Temporary to medium-term duration;</li> <li>• Frequent events;</li> <li>• Severity predominantly related to moderate changes in morbidity or major change in quality-of-life;</li> <li>• Large minority of population affected;</li> <li>• Gradual reversal; and</li> <li>• Small service quality implications.</li> </ul>
Low	<ul style="list-style-type: none"> <li>• Very low exposure or small scale; temporary duration;</li> <li>• Occasional events;</li> <li>• Severity predominantly related to minor change in morbidity or moderate change in quality-of-life;</li> <li>• Small minority of population affected;</li> <li>• Rapid reversal; and</li> <li>• Slight service quality implications.</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>• Negligible exposure or scale;</li> <li>• Momentary or brief duration;</li> <li>• One-off frequency; severity predominantly relates to a minor change in quality-of-life;</li> <li>• Very few people affected;</li> <li>• Immediate reversal once activity complete; and</li> <li>• No service quality implication.</li> </ul>
Adapted from the IEMA Guide to: Determining Significance for Human Health in Environmental Impact Assessment (IEMA 2022b) with categories of sensitivity aligned to EPA Guidelines (EPA 2022) terminology. * Judgement based on most relevant criteria – some criteria will span categories	

The judgement of significance relies on an informed professional judgement about what is important, desirable or acceptable with regards to changes triggered by the Proposed Development. In arriving at a conclusion on significance for decision-making purposes, the assessor has considered the following interrelated questions:

- Is the impact important, desirable or acceptable in terms of public health?; and
- Is the impact important, desirable or acceptable in terms of the affected community's resilience, service provision and wellbeing?

The judgement of significance is guided by Diagram 6.3 and has taken account of evidence in scientific literature, the baseline conditions for the population and communities affected, the health priorities of the study area, community concerns identified through consultation, regulatory standards and Ireland health and sustainable development policy context.

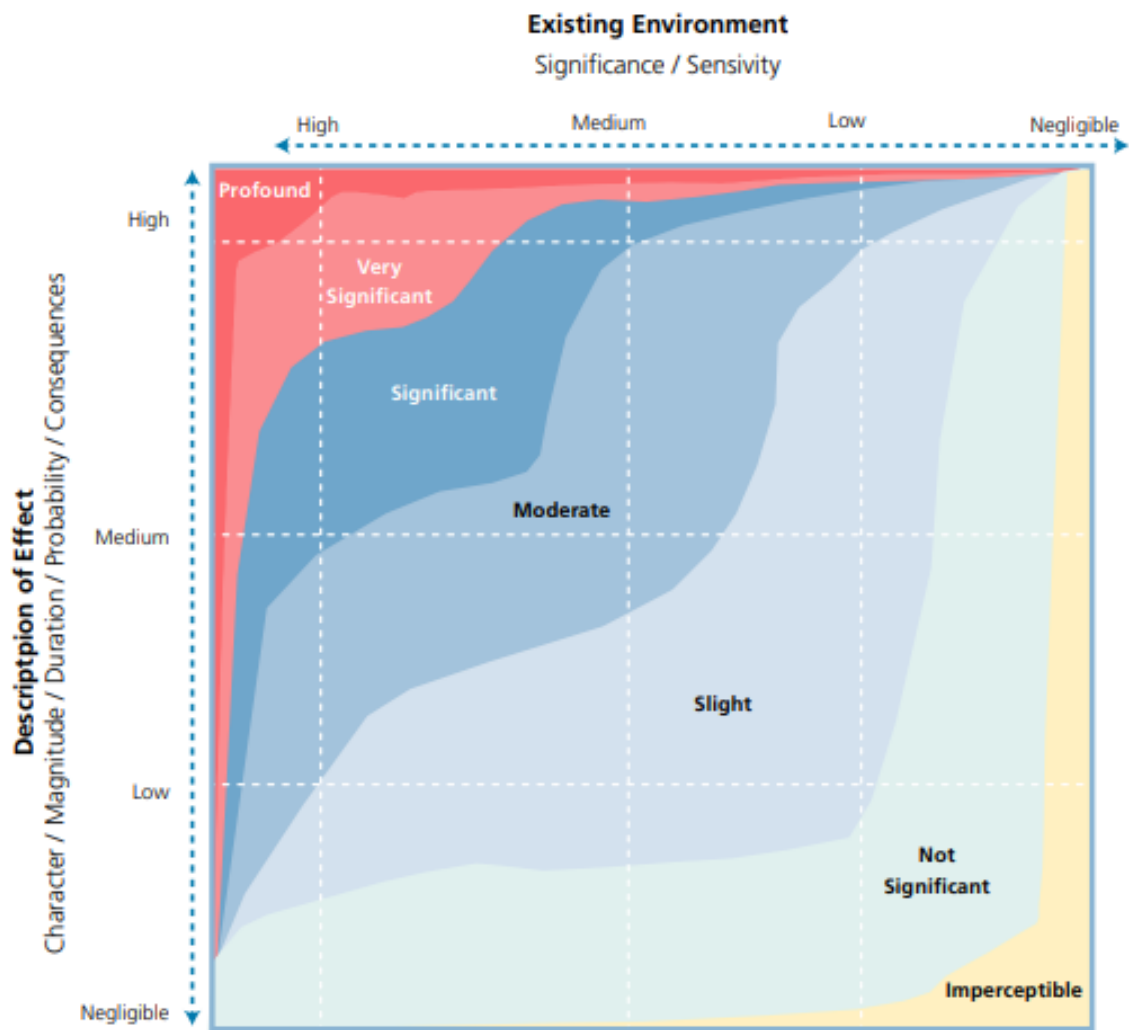


Diagram 6.3: Guide to Significance Classification (EPA 2022)

For each conclusion of significance against impacts relating to the assessed health determinants, a reasoned statement is provided. The reasoned statement on significance is guided by the criteria in Table 6.4. It should be noted that not all criteria are relevant to every conclusion made. For decision-making purposes, a significant impact is one classed as 'Significant' or higher using the EPA significance classification categories. Impacts which are judged to be 'Moderate' or 'Slight' may become 'Significant' where several such impacts combine and interact on a single community. Such impacts will be captured within the assessment.

**Table 6.4: Human Health Significance Criteria**

Level	Indicative Criteria*
Profound	<p>The narrative explains that this is significant for public health and / or community wellbeing because (select as appropriate)</p> <ul style="list-style-type: none"> <li>Changes, due to the project, would compromise 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 impact.</li> <li>Change, due to the project, would result in a regulatory threshold or statutory standard being crossed (if applicable).</li> <li>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.</li> <li>In addition, health priorities for the relevant study area are of specific relevance to the determinant of health or community affected by the project.</li> </ul>
Very Significant	<p>The narrative explains that this is significant for public health and / or community wellbeing because (select as appropriate)</p> <ul style="list-style-type: none"> <li>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 broad consensus on the importance of the impact.</li> <li>Change, due to the project, could result in a regulatory threshold or statutory standard being crossed (if applicable).</li> <li>There is likely to be a sizeable 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.</li> <li>In addition, health priorities for the relevant study area are of specific relevance to the determinant of health or community affected by the project.</li> </ul>
Significant	<p>The narrative explains that this is significant for public health and / or community wellbeing because (select as appropriate)</p> <ul style="list-style-type: none"> <li>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.</li> <li>Change, due to the project, could result in a regulatory threshold or statutory standard being approached (if applicable).</li> <li>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 good evidence of a relationship between changes that would result from the project and changes to health outcomes.</li> <li>In addition, health priorities for the relevant study area are of general relevance to the determinant of health or community affected by the project.</li> </ul>
Moderate	<p>The narrative explains that this is not significant for public health and / or community wellbeing because (select as appropriate)</p> <ul style="list-style-type: none"> <li>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 limited relevant consultation themes emerge among stakeholders.</li> <li>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).</li> <li>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 some evidence of a relationship between changes that would result from the project and changes to health outcomes.</li> <li>In addition, health priorities for the relevant study area are of partial relevance to the determinant of health or population group affected by the project.</li> </ul>
Slight	<p>The narrative explains that this is not significant for public health and / or community wellbeing because (select as appropriate)</p> <ul style="list-style-type: none"> <li>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.</li> </ul>

Level	Indicative Criteria*
	<ul style="list-style-type: none"> <li>• 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).</li> <li>• 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.</li> <li>• 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.</li> </ul>
Not Significant	<p>The narrative explains that this is not significant for public health and / or community wellbeing because (select as appropriate)</p> <ul style="list-style-type: none"> <li>• Changes, due to the project, do not affect 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.</li> <li>• Change, due to the project, would not affect a regulatory threshold, statutory standard or guideline (if applicable).</li> <li>• 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 lack of scientific literature showing any evidence of a relationship between changes that would result from the project and changes to health outcomes.</li> <li>• In addition, health priorities for the relevant study area are not relevant to the determinant of health or population group affected by the project.</li> </ul>
Imperceptible	<p>The narrative explains that this is not significant for public health and / or community wellbeing because (select as appropriate)</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Change, due to the project, would not affect a regulatory threshold, statutory standard or guideline (if applicable).</li> <li>• 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.</li> <li>• In addition, health priorities for the relevant study area are not relevant to the determinant of health or population group affected by the project.</li> </ul>
<p>Adapted from the IEMA Guide to: Determining Significance for Human Health in Environmental Impact Assessment (IEMA 2022b) with categories of sensitivity aligned to EPA Guidelines (EPA 2022) terminology.                      * Judgement based on most relevant criteria - some criteria will span categories</p>	

#### 6.2.4.4 Assumptions and Limitations

Health data used to inform this assessment are at population level rather than clinical level. Since the assessment is reliant on aggregated data at population level, it cannot be used to infer potential impacts on health outcomes at individual (clinical) levels.

Although the assessment refers to research that demonstrates evidence of association between changes in health determinants and effects on health, this should not be interpreted as causation. It is not possible to draw conclusions on cause-and-effect relationships for human health using aggregated population-level data.

There are difficulties in estimating the level of exposure of the population to impacts on certain health determinants. For example, it is difficult to ascertain what proportion of their lives each individual within a given population spends in a place that is exposed to the impact and also whether individuals have been exposed to other factors also associated with a given health outcome. It is also difficult to estimate exposure due to the nature of environmental assessment results yielded by the industry standard guidelines applied for various environmental aspects. Any such uncertainty is set out in the assessment reported in Section 6.4.

The availability of health data in some cases is limited either due to the geographic scale, or the timescale that it covers. The nature of limitations, as relevant to specific baseline data, is explained in Section 6.3.

## 6.3 Baseline Environment

### 6.3.1 Population and Sociodemographics

Table 6.5, Table 6.6 and Table 6.7 set out population demographic data for the study area. It is notable that many of the small areas within the study area in Fingal, and to a lesser extent Dublin City, have a high proportion of children (aged under 16) relative to the national average. There are also two small areas within Fingal (267099015/01 and 267066001) which have a notably higher proportion of older adult residents than the national average. In contrast, small areas within County Meath generally have a higher proportion of older adults than the national average, with only one small area (167054005) having a high proportion of under 16-year-olds.

Figure 6.1 in Volume 4 of this EIAR shows the 2022 Pobal HP deprivation index data (Pobal 2023) for the study area presented at electoral division level. The Pobal HP index measures an area's level of relative affluence or disadvantage based on 10 measures including educational attainment and employment status. The electoral divisions which coincide with the study area within Dublin City are classified as 'Disadvantaged' and 'Very disadvantaged', whereas the remainder of the study area is classified as 'Marginally above average' (with the exception of Kilsallaghan electoral division in Fingal which is classified as 'Marginally below average').

**Table 6.5: Population Demographics for Dublin City**

Indicator	Small Areas – Dublin City				Republic of Ireland (ROI)
	268121002	268121001	268122003	268122007	
Males (%)	48	47	48	49	49
Females (%)	52	53	52	51	51
Age under 16 (%)	<b>26</b>	19	<b>26</b>	20	20
Age 65 and over (%)	6	14	11	11	15

Note: Data obtained from CSO (CSO 2023). Bolded values are considered notably higher than the ROI average.

**Table 6.6: Population Demographics for Fingal**

Indicator	Small Areas - Fingal													ROI
	267098001/01	267001009/03	267158009/02	267158024	267158022	267005001/02	267099015/01	267099021	267066001	267158025	267158001	267132011	267132001/03	
Males (%)	50	53	55	47	52	47	59	51	50	51	48	50	47	49
Females (%)	50	47	45	53	48	53	41	49	50	49	52	50	53	51
Age under 16 (%)	12	<b>32</b>	13	<b>27</b>	<b>23</b>	<b>45</b>	<b>25</b>	<b>26</b>	12	<b>37</b>	23	24	<b>33</b>	20
Age 65 and over (%)	13	7	18	6	2	10	<b>26</b>	11	<b>37</b>	2	7	5	2	15

Note: Data obtained from CSO (CSO 2023). Bolded values are considered notably higher than the ROI average.

**Table 6.7: Population Demographics for County Meath**

Indicator	Small Areas – County Meath													ROI
	167024002/01	167024003	167025001/03	167029019	167029021	167029003	167029018	167030019	167030021	167029015	167029001	167029004	167054005	
Males (%)	49	51	51	50	48	52	47	48	50	50	47	51	49	49
Females (%)	51	49	49	50	52	48	53	52	50	50	53	49	51	51
Age 16 and under (%)	23	22	17	24	18	22	21	22	18	19	17	16	<b>26</b>	20
Age 65 and over (%)	<b>20</b>	<b>22</b>	19	4	13	9	3	22	27	27	22	<b>20</b>	18	15

Note: Data obtained from CSO (CSO 2023). Bolded values are considered notably higher than the ROI average.

### 6.3.2 Health Profile

Table 6.8, Table 6.9 and Table 6.10 show health indicator data for the study area. Health indicator data is presented at small area level where publicly available, and at the smallest publicly available geographical unit in all other cases.

Within Dublin City, two of the small areas within the study area have several indicators that suggest the population may be vulnerable to changes in health status, including a relatively high proportion of people who are long term unemployed or unable to work due to illness compared to the national average, a relatively high proportion of people with some level of disability and a relatively low level of people with either good or very good self-reported health (see Table 6.8). At county level, the proportion of people with 'good' or 'very good' health is notably lower than the national average and the Standardised Mortality Ratio (SMR) (the SMR is a measure which adjusts for differences in age structure between populations, so that the death rates of those populations can be compared without age being a factor in the differences seen) for cancer deaths in Dublin City is above the Ireland average, but the SMRs for deaths from heart disease and stroke and for deaths from respiratory disease are below or similar to the national average.

Health indicator data for small areas within Fingal (see Table 6.9) suggest generally resilient populations, with lower than average levels of people who are unemployed or unable to work due to illness or disability or with some level of disability. There are however a few small areas (e.g. 267001009/03, 267158009/02, 267005001/02 and 267066001) with notably lower than average proportions of people with good or very good self-reported health, although proportions of people with bad or very bad health in these small areas are not correspondingly higher.

Small area 67099015/01 (a rural area immediately north-east of Dublin Airport) is a notable exception within Fingal as it has substantially higher than average levels of people who are unemployed or unable to work due to illness or with some level of disability. The SMR for deaths from cancer, heart disease and stroke and deaths from respiratory diseases for Fingal as a whole are in line with or below the national average.

Health indicator data for County Meath (see Table 6.10) also suggests resilient populations, with the proportion of people unemployed or unable to work due to illness or disability, with some level of disability or with bad or very bad self-reported health below the national average and the proportion of people with good or very good self-reported health higher than the national average for all small areas. The SMR for deaths from cancer, deaths from heart disease and deaths from respiratory diseases for County Meath are all below the national average.

**Table 6.8: Health Indicator Data for Dublin City**

Indicator	Small Areas –Dublin City				Dublin City	ROI
	268121002	268121001	268122003	268122007		
Long term unemployed or unable to work due to illness or disability (%)*	19	10	19	11	7	7
Disability (to some and/or great extent) (%)*	30	18	27	19	22	22
Health 'bad' or 'very bad' (%)*	3	2	4	3	2	2
Health 'good or 'very good' (%)*	71	88	61	57	76	83
Deaths cancer – all ages (5 year age standard deaths 2008 – 2012) (Age standardised mortality rate (SMR))**	Data not available				183.5	175.6
Deaths heart disease and stroke – all ages (5 year age standard deaths 2008 – 2012) (SMR)**	Data not available				169.1	182.6
Deaths respiratory disease – all ages (5 year age standard deaths 2008 – 2012) (SMR) **	Data not available				65.1	64.9
* Data obtained from CSO (CSO 2023)						
** Data obtained from HSE (HSE 2015a)						
Note: Values in bold are considered notably different than the ROI average.						



**Table 6.9: Health Indicator Data for Fingal**

Indicator	Small Areas -Fingal													Fingal	ROI
	267098001/01	267001009/03	267158009/02	267158024	267158022	267005001/02	267099015/01	267099021	267066001	267158025	267158001	267132011	267132001/03		
Long term unemployed or unable to work due to illness or disability (%)*	7	2	7	4	3	6	21	5	5	4	1	5	1	6	7
Disability (to some and/or great extent) (%)*	16	10	17	11	14	16	33	23	16	13	7	12	9	19	22
Health 'bad' or 'very bad' (%)*	1	1	0	0	0	2	4	1	2	1	0	1	0	1	2
Health 'good or 'very good' (%)*	82	53	71	91	91	47	36	85	68	89	90	79	93	84	83
Deaths cancer – all ages (5 year age standard deaths 2008 – 2012) (Age standardised mortality rate (SMR))**	Data not available													175.6	175.6
Deaths heart disease and stroke – all ages (5 year age standard deaths 2008 – 2012) (SMR)**	Data not available													169.1	182.6
Deaths respiratory disease – all ages (5 year age standard deaths 2008 – 2012) (SMR) **	Data not available													65.1	64.9
* Data obtained from CSO (CSO 2023)															
** Data obtained from HSE (HSE 2015b)															
Note: Values in bold are considered notably different than the ROI average.															

**Table 6.10: Health Indicator Data for County Meath**

Indicator	Small Areas – County Meath													County Meath	ROI
	167024002/01	167024003	167025001/03	167029019	167029021	167029003	167029018	167030019	167030021	167029015	167029001	167029004	167054005		
Long term unemployed or unable to work due to illness or disability (%)*	3	6	5	3	2	2	2	2	5	3	3	4	3	6	7
Disability (to some and/or great extent) (%)*	14	24	18	9	15	17	14	14	23	20	21	23	18	22	22
Health 'bad' or 'very bad' (%)*	1	3	3	1	1	1	0	1	2	1	2	2	1	1	2
Health 'good or 'very good' (%)*	91	84	87	88	92	92	93	90	85	87	90	89	89	84	83
Deaths cancer – all ages (5 year age standard deaths 2008 – 2012) (Age standardised mortality rate (SMR))**	Data not available													159.4	175.6
Deaths heart disease and stroke – all ages (5 year age standard deaths 2008 – 2012) (SMR) **	Data not available													162.6	182.6
Deaths respiratory disease – all ages (5 year age standard deaths 2008 – 2012) (SMR)**	Data not available													60.5	64.9
* Data obtained from CSO (CSO 2023)															
** Data obtained from HSE (HSE 2015c)															
Note: Values in bold are considered notably different than the ROI average.															

### 6.3.3 Open Space, Leisure and Recreation

A review on access to greenspace by Public Health England identified pathways through which greenspace can promote positive health and wellbeing outcomes such as encouraging greater physical activity, recreational activities, connection with nature, and community and social cohesion (Public Health England 2020). The health benefits of regular physical activity are well researched and widely accepted. For most people, the easiest forms of physical activity are those that can be built into daily life, for example, by walking or cycling as an alternative to motorised transport for everyday journeys such as commuting to work or school. Active forms of travel, such as walking and cycling, are associated with a range of health benefits. These include improved mental health, reduced risk of premature death and prevention of chronic diseases such as coronary heart disease, stroke, type 2 diabetes, osteoporosis, depression, dementia and cancer (British Medical Association 2012). Research also suggests that countries with the highest levels of active travel (walking and cycling) generally have amongst the lowest obesity rates (Bassett *et al.* 2008). There has been growing concern over increasing levels of obesity in Ireland, with the percentage of people in Ireland who are overweight or obese rising from 31% in 1998 (Kavanagh *et al.* 2005) to 62% in 2017 (CSO 2019). Physical inactivity is a key risk factor for obesity and switching from active modes of travel (walking and cycling) to car use has helped to fuel physical inactivity.

Section 5.3 of Chapter 5 (Population) in Volume 2 of this EIAR identifies leisure and recreational facilities, including areas of open space, which are located within the study area. Those within or adjacent to the Planning Application Boundary are:

- Athletic Union League (AUL) Sports Complex (Clonshaugh, Fingal);
- Craobh Chiaráin Gaelic Athletic Association (GAA) pitches (Belcamp, Fingal);
- Forest Little Golf Club (Swords, Fingal);
- National Show Centre (Swords, Fingal);
- St Margaret's GAA Club (Skephubble, Fingal);
- Dunboyne Association Football Club (AFC) Grounds (Dunboyne, County Meath); and
- Karlswood Equestrian Centre (Batterstown, County Meath).

The locations of these facilities are shown on Figure 5.1 in Volume 4 of this EIAR. There are 10 further leisure and recreational facilities within the study area, as shown on Figure 5.1 of Volume 4 of this EIAR, including two further golf clubs, four football clubs, a karate dojo, Pilates centre, equestrian centre and sports complex.

### 6.3.4 Employment and Income

Employment and income are an important determinant of health and wellbeing, with a healthy standard of living such as adequate income and housing associated with many positive health outcomes. The long term unemployed often have a lower life expectancy and worse health than those who are employed (Bartley *et al.* 2005), and evidence from the United Kingdom (UK) shows that children growing up in non-working families are almost twice as likely to fail at education at any stage than children growing up in working families (Department for Work and Pensions 2017). As described in Section 6.3.2 there are relatively high levels of people who are long term unemployed or unable to work due to disability within two of the small areas in Dublin City and one of the small areas within Fingal (refer to Figure 6.1 in Volume 4 of this EIAR).

Section 5.3 of Chapter 5 (Population) in Volume 2 of this EIAR details the economic conditions within the study area, including employment within the construction sector. Section 5.3 of Chapter 5 (Population) describes land uses within the study area that may provide employment opportunities locally. These include two commercial or business parks (Barstown Commercial Park, Dunboyne and Dunboyne Business Park, Dunboyne), five commercial premises relating to the automotive industry, as well as 28 other commercial premises. Figure 5.1 in Volume 4 of this EIAR shows the locations of business, commercial and industrial premises within the study area. In addition, there are 40 agricultural landholdings located within the Planning Application Boundary for the Proposed Development (see Section 15.3 of Chapter 15 (Agronomy and

Equine) in Volume 2 of this EIAR which will also provide employment opportunities within the study area (see Figure 15.1 in Volume 4 of this EIAR).

### **6.3.5 Transport Modes, Access and Connections**

Transport is required for access to a variety of resources important to health and social inclusion, including traveling to work or school, visiting family and friends, accessing health services, and shopping and leisure. Poor access to transport results in barriers to these important health resources and can contribute to health inequalities and social exclusion. In addition, walking, cycling and horse riding for recreational purposes or to access places of employment or study provide opportunities for daily physical activity that are important for maintaining good mental and physical health as described under Section 6.3.3.

Section 14.3 of Chapter 14 (Traffic and Transport) in Volume 2 of this EIAR describes roads, walking and cycling facilities and public transport (bus and rail) facilities within the study area. Routes likely to be affected by the Proposed Development are summarised in the following sections.

#### **6.3.5.1 Private Vehicles**

Census 2022 data (CSO 2023) shows that 65% of residents of Dublin City have access to a car, which is aligned with national average of 63%. The proportion of residents with access to a car in Fingal and County Meath is 90% and 93%, respectively, reflecting a tendency for greater car dependency in more rural areas.

The Proposed Development will cross three motorways (M1, M2 and M3), and a further 13 regional and local roads are expected to be affected by Temporary Traffic Management (TTM) measures. No disruption to access is anticipated for the M1, M2 and M3 Motorways as trenchless techniques will be used to avoid direct impacts on these routes. The regional and local roads which may be affected include the R156, R157 and R147 Regional Roads, L5026 Pace, L1010 Nuttstown Road/Priestown Road, L1007 Kilbride Road, the R121 and R122 Regional Roads, Kilreesk Road, R108 Regional Road, Naul Road and Stockhole Lane. Figure 14.1 in Volume 4 of this EIAR shows the location of regional and local roads likely to be affected by TTM sections.

#### **6.3.5.2 Public Transport (Rail and Bus)**

The Proposed Development will cross one railway line, the M3 Parkway Service rail line, just north of the M3 Parkway Service station. As for the M1, M2 and M3 Motorways, trenchless techniques will be used to cross this railway line, and no direct impacts are anticipated. For this reason, these routes are scoped out of further assessment.

There are 34 local and regional bus routes which use roads likely to be affected by TTM measures (see Chapter 14 (Traffic and Transport) in Volume 2 of this EIAR) which provide access between Dublin and Swords, Skerries, Balbriggan, Kilsallaghan, Rolestown, Ashbourne, Drogheda, Ratoath, Kells, Trim, Athboy and Clonmellon, between Navan and Dunboyne, and between Drogheda and Blanchardstown or Maynooth, and Maynooth and Kells, Cavan or Carrickmacross.

#### **6.3.5.3 Walking, Cycling and Horse-Riding Facilities**

Regional and local roads within the vicinity of the Proposed Development are generally rural in nature and do not have footways. Nevertheless, they are likely still used for active travel and recreational walking and cycling, with some of the more rural routes also likely used for horse riding. Figure 14.6 in Volume 4 shows the existing cycling network within the vicinity of the Proposed Development. In addition to the existing routes shown on Figure 14.6 in Volume 4 of the EIAR, a comprehensive network of new routes is proposed within the Greater Dublin Draft Cycle Network Plan (National Transport Authority (NTA) 2021) and the draft Ireland's Cycle Network plan (NTA 2023).

#### 6.3.5.4 Key Routes for Vulnerable Users

Key routes which may be used by walkers and cyclists and which are also identified as being potentially used by more vulnerable groups (children, older people and people with disabilities) (see Figure 6.1 in Volume 4 of the EIAR) include:

- L1007 Kilbride Road, Kilbride: This may be used by children to access Scoil Bhríde, Kilbride and intersects the Planning Application Boundary;
- R122 Regional Road at Ballystrahan, Swords, Fingal: The proposed cable route will be routed along this road, and Little Moo Moos Playschool is located directly on this road directly adjacent to the Planning Application Boundary;
- R121 Regional Road at New Park, The Ward, Fingal: The proposed cable route will be routed along this road, and New Park Care Centre is located directly on this road directly adjacent to the Planning Application Boundary;
- R156 Regional Road at Harlockstown, Dunboyne, County Meath: The proposed cable route will be routed along this road, and Dunboyne Nursing Home is located on this road directly adjacent to the Planning Application Boundary; and
- Stockhole Lane, Cloghran: Anovocare Nursing Home, Cloghran, Fingal is located adjacent to the Planning Application Boundary at this location.

#### 6.3.6 Air Quality

The WHO Global Air Quality Guidelines: Particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide (WHO 2021) serve as a global target for national, regional and city governments to work towards improving people's health by improving air quality through reducing pollution. Air pollution is a complex mixture of solid particles, liquid droplets and gases. Air pollution is the greatest environmental threat to human health and is the leading cause of non-communicable diseases (NCDs) such as heart attacks and stroke. Air pollutants measured include particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO) and sulphur dioxide (SO<sub>2</sub>) (WHO 2021).

Chapter 7 (Air Quality) in Volume 2 of this EIAR provides a detailed air quality baseline for the Proposed Development, which is summarised briefly as follows. The eastern half of the Proposed Development will be located within the Dublin Conurbation air quality zone (Zone A) and the western half of the Proposed Development will be located in the Rural Ireland air quality zone (Zone D). There is one air quality monitoring station within the study area, located to the east of Dublin Airport, and monitoring data for 2022 (EPA 2023) showed annual mean concentration values for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> were all within the relevant Limit Values, but annual mean PM<sub>2.5</sub> and NO<sub>2</sub> values exceed the WHO Global Air Quality Guidelines: Particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide values indicating a likelihood of some air pollution related health outcomes within the population, but that the overall level of health protection is considered acceptable against the current Limit Values.

#### 6.3.7 Noise and Vibration

Noise from road traffic alone is the second most harmful environmental stressor in Europe, behind only air pollution (WHO 2018). The harmful effects of noise arise mainly from the stress reaction it causes in the human body, which can also occur during sleep. There is good evidence that increased long-term exposure to traffic noise is associated with significant increases in the prevalence and the incidence of ischaemic heart disease (IHD) (van Kempen *et al.* 2018). It should be noted that while research shows this association, the level of risk attributed to noise exposure is much smaller than for other risk factors such as diet, exercise, and smoking. Noise is also associated with sleep disturbance and annoyance.

Chapter 9 (Noise and Vibration) in Volume 2 of this EIAR provides a noise baseline for the Proposed Development, which is summarised briefly as follows. Baseline noise levels are likely to vary across the study area, with the main noise sources likely to be road traffic and airport noise. Highest noise levels are likely to

occur in urban areas towards the east of the study area, and generally lower noise levels in the western extent of the study area, except in close proximity to road or rail infrastructure. Woodland Substation is noted particularly as being within a rural area.

Baseline noise mapping has not been undertaken (see Section 9.2 of Chapter 9 (Noise and Vibration) in Volume 2 of this EIAR). However strategic noise mapping (EPA n.d.) indicates that WHO Noise Guidelines (WHO 2018) values for road traffic noise are exceeded adjacent to major roads within the study area including the M3, M2 and M1 Motorways, R108, R121, R122, R132, and R135 Regional Roads during both the day and the night and that noise levels exceed the WHO Noise Guidelines values for aircraft traffic noise across much of the study area. The WHO notes that the WHO Noise Guidelines values are aspirational and unlikely to be achieved in many urban contexts.

### 6.3.8 Vulnerable Groups and Sensitive Locations

Certain groups are more vulnerable to changes in the health determinants scoped into the assessment for the Proposed Development (see Table 6.1). These include:

- People who are more likely to have limited mobility (older people and people with disabilities) who would find it more difficult to adapt to changes in access to transport and community facilities, and any increases in road traffic volumes and speeds on diversion routes;
- People who are more likely to have poor health (including older people and people with disabilities) who are more likely to need to access healthcare facilities;
- People who are more sensitive to changes in availability of opportunities for physical activity and access to open space (people with poor health, children);
- People who are more vulnerable to air pollution (children, older people, people in poor health);
- People who are more vulnerable to noise pollution (children and shift workers); and
- The farming community, as this population sub-group is likely to be most affected by temporary and permanent land take as a result of the Proposed Development.

Figure 6.1 in Volume 4 in this EIAR shows locations of facilities of importance to children, elderly and people with poor health and/or disabilities, (e.g. schools, pre-schools and nurseries, nursing homes and care homes) as well as identifying small areas which have relatively high proportions of older people, children, people with disabilities, and people with bad or very bad health. Figure 6.1 in Volume 4 in this EIAR also identifies areas in Dublin City that the 2022 Pobal HP Index (Pobal 2023) assesses as being 'disadvantaged' or 'very disadvantaged'.

### 6.3.9 Sensitivity of Populations

Three small areas have been identified as having high sensitivity as the sociodemographic and health baseline data presented in Section 6.3.1 and Section 6.3.2 show that these three populations have high proportions of more vulnerable residents (children aged under 16 and / or people aged over 65), as well as other indicators that suggest residents may be more vulnerable to adverse health outcomes (high levels of deprivation and / or high proportions of residents who are unable to work due to disability or are long-term unemployed, and high proportion of residents with a disability). The locations of these high sensitivity populations are shown on Figure 6.1 in Volume 4 in this EIAR, and are as follows:

- Dublin City - 268121002;
- Dublin City - 268122003; and
- Fingal - 267099015/01.

The populations of all other small areas within the study area are considered to have low sensitivity as although all either have relatively high proportions of children or older adults (aged over 65) than the national average, other health indicators are generally better than the national average and levels of deprivation are below the national average.

The population sub-groups of children (aged under 16), older people (aged over 65), and people with disabilities are considered to have high sensitivity as these groups would include a high proportion of dependants, people with very low capacity to adapt and some people prevented from undertaking daily activities.

The farming community is judged to be of medium sensitivity. This reflects a community whose outlook is predominantly uncertainty with some concern. There is significant concern around mental health in the farming community as farmers can face a combination of factors such as increased regulations and costs, unpredictable weather, isolation and long working hours (Rose *et al.* 2023). One recent national level survey on farmer's wellbeing found that 23.4% of the 256 farmers who responded to the survey were considered at risk of suicide (Stapleton *et al.* 2022).

## 6.4 Potential Impacts

### 6.4.1 'Do Nothing' Scenario

Under a Do Nothing scenario the health status of populations scoped into the assessment (described in Section 6.3), would be expected to change with time, in accordance with current trends across Ireland, as set out in Health In Ireland: Key Trends (Department of Health 2022) including:

- Increases in the proportion of the population aged over 65;
- Reductions in mortality rates from respiratory diseases and circulatory system diseases; and
- Reductions in suicide rates.

### 6.4.2 Construction Phase

#### 6.4.2.1 Open Space, Leisure and Recreation

As identified in Section 5.4 of Chapter 5 (Population) in Volume 2 of this EIAR, no land take from residential, commercial receptors or community / recreational facilities is anticipated during the Construction Phase. Construction activities will generate noise and dust (see Chapter 7 (Air Quality) and Chapter 9 (Noise and Vibration) in Volume 2 of this EIAR), which are most likely to affect the following facilities which are located within or adjacent to the Planning Application Boundary:

- AUL Sports Complex (Clonsaugh, Fingal) (small area 267005001/02);
- Craobh Chiaráin GAA pitches (Belcamp, Fingal) (small area 267005001/02);
- Forest Little Golf Club (Swords, Fingal) (small area 267001009/03);
- National Show Centre (Swords, Fingal) (small area 267099015/01);
- St Margaret's GAA Club (Skephubble, Fingal) (small area 267098001/01);
- Dunboyne AFC Grounds (Dunboyne, County Meath) (small area 167029004); and
- Karlswood Equestrian Centre (Batterstown, County Meath) (small area 167024003).

As stated in Section 5.4 of Chapter 5 (Population), and with full details in Chapter 4 (Proposed Development Description) in Volume 2 of this EIAR, the rolling nature of the construction programme means that the duration of impacts on these facilities will be very short-term in duration, and as such, they are not considered likely to be sufficient to dissuade the use of these facilities for recreational physical activity. The National Show Centre is likely to draw visitors on a regional or national level, rather than serve the local community, with the majority of people who visit the National Show Centre expected to be attending a specific event rather than depending on it on a frequent basis for their health and wellbeing. The magnitude of impact is assessed as negligible given the very localised and short-term nature of the impacts which would affect very few people, and where the health impact is considered likely to relate to a minor change in quality of life to those people who use the facilities. The majority of affected small areas are assessed as having low sensitivity, with the exception of small area 26700015/01. However, the only affected asset in small area 26700015/01

is the National Show Centre which as previously explained is not considered to be an important resource for recreation and wellbeing for the local community. Therefore, the significance of impact is assessed as Negative, Imperceptible and Temporary to public health for all small areas.

### 6.4.2.2 Employment and Income

Section 5.4 of Chapter 5 (Population) assesses the potential impact of the Construction Phase of the Proposed Development on local employment opportunities and economy. This assessment concludes that due to the low total numbers of construction workers required for the Proposed Development of this scale, and the fact that the nature of the Proposed Development (i.e. high voltage underground cable and upgrade works to the existing Woodland Substations and the construction of a new Gas Insulated Switchgear (GIS) Hall and associated equipment at the extension to the Belcamp Substation) means specialist contractors will likely be required for health and safety reasons, job opportunities for local communities during the Construction Phase are likely to be very limited. For this reason, the magnitude of impact on the general population of all small areas scoped into assessment is considered to be negligible and the significance of the health impact is assessed as Neutral, Imperceptible and Short-Term.

Whilst the majority of the Proposed Development (approximately 70%) will be located within the existing road network, the remaining 30% will be located within land currently used for agricultural purposes. As set out in Table 15.6 in Chapter 15 (Agronomy and Equine) in Volume 2 of this EIAR, in the absence of mitigation it is anticipated that construction impacts on seven of the 40 agricultural land holdings would be sufficient to change the way in which the farm is operated (i.e., a significance of impact assessed as moderate adverse or above as per the assessment methodology in Chapter 15 (Agronomy and Equine)). The farms are located in Fingal on the northern outskirts of Dublin City, within small areas 267099021 and 267005001/02 (see Figure 15.1 in Volume 4 of this EIAR). None of the affected land holdings are considered likely to experience impacts which would threaten or prevent the continued viability of operations. However, in the absence of mitigation, there is the potential for mental health impacts associated with concerns over financial insecurity in the short term. Since mental health concerns in the farming community are considered to be relatively widespread, the magnitude of impact on this sub-population in the study area is considered to be medium and the significance of the impact is assessed as Negative, Moderate and Short-Term.

### 6.4.2.3 Transport Modes, Access and Connections

Temporary measures will be implemented to ensure that direct access points to community facilities, including places of education or employment, medical facilities, shops and banks, recreational facilities and access points to other transport modes (e.g., bus stops and the M3 Parkway rail station) will be maintained throughout construction (see Section 5.4 of Chapter 5 (Population) in Volume 2 of this EIAR for further detail).

Temporary lane and road closures will be required to facilitate construction activities (see Chapter 14 (Traffic and Transport) in Volume 2 of this EIAR for further details). However, diversion routes will be provided and there will be no loss of access to community facilities. The maximum increase in journey time resulting from road closures is assessed as approximately 20 minutes based on precautionary assumptions, and in most cases, less than 10 minutes.

Section 14.4 in Chapter 14 (Traffic and Transport) presents data showing the anticipated changes in total traffic flows (Annual Average Daily Traffic (AADT) flows) and Heavy Good Vehicles (HGV) flows on the highway network during peak construction. In general, the increase in AADT flows during peak construction will be very low (<11%), with the exception of one route (Ballymacarney Road, west of Chapel Drive) and a motorway onslip / offslip on the M3 Motorway Northbound. However, quite substantial percentage increases in HGV volumes (>30%) will be seen at 22 locations (see Chapter 14 (Traffic and Transport)). Whilst the percentage increase in HGV flows is large on these routes, it mainly reflects the very low numbers of HGVs using these routes under baseline conditions, and in the majority of cases the duration over which the



percentage magnitude reported in Chapter 14 (Traffic and Transport) would be seen is less than a week of the total construction period (approximately 42 months).

Of those 22 locations where a large percentage increase in HGV flows is anticipated, four locations are considered particularly sensitive due to the presence of facilities of importance to older people or children nearby who walk or cycle these routes on a regular basis (see Section 6.3.5.4):

- L1007 Kilbride Road (Kilbride (Scoil Bhríde)) (small area 167025001/03 in County Meath);
- R121 Regional Road at New Park, The Ward, Fingal (New Park Care Centre) (small area 267066001 in Fingal);
- R156 Regional Road to the north-west of Dunboyne (Dunboyne Nursing Home) (small area 167024003 in County Meath); and
- Stockhole Lane, Cloghran (Anovocare Nursing Home) (on the boundary between small areas 267005001/02 and 267099021 in Fingal).

Stockhole Lane, Cloghran and the R121 Regional Road at New Park have footways on one or both sides of the carriageway in proximity to the Anovocare Nursing Home, and the L1007 Kilbride Road has footways in close proximity to Scoil Bhríde but not along the full extent of the affected route which links residential areas to the south of Scoil Bhríde. There are no footways or crossing facilities on the R156 Regional Road in close proximity to Dunboyne Nursing Home.

All dedicated walking and cycling routes will remain open. However, temporary increases in traffic volumes are anticipated to affect a number of routes due to the implementation of TTM measures on the road network (see Chapter 14 (Traffic and Transport)). Journey times on 34 bus routes are anticipated to increase as a result of temporary or full road closures. However, all routes will remain operational (with only the 40B Parnell Street – Toberburr and UM03 Dundalk – Maynooth University requiring diversions), and as stated above, no impacts on access points to public transport are anticipated.

There will be no loss of access to community facilities (including public transport access points) or walking and cycling routes. In addition, temporary increases in total traffic (AADT) and HGV volumes will generally be relatively low and will not be sufficient enough to dissuade most people from undertaking active travel journeys (recreational walking and cycling), or travelling to meet friends and family or to partake in social activities. Therefore, the magnitude of impact on the transport modes, access and connections health determinant is considered to be low for most populations. However, in the absence of mitigation, it is considered that the increased volume of HGVs could potentially be sufficient to dissuade the use of these routes by vulnerable road users (children and older people) and present an increased risk of road traffic collisions. However, the duration over which increased HGV volumes are expected will be in the order of weeks rather than months (see Table 14.19 in Chapter 14 (Traffic and Transport)), and so, changes in physical activity levels and social isolation will only be likely to have a minor effect on quality of life. For this reason, the magnitude of impact is also assessed as low for older people and children within three small areas where substantial percentage increases in HGV flows are anticipated in close proximity to locations of importance to older people and children (small areas 167025001/03 and 167025001/03 in County Meath, small areas 267005001/02 and 267099021 in Fingal). However, specific mitigation measures are proposed to minimise risks to these groups (see Section 6.5). The significance of impact, in the absence of mitigation, will be Negative, Slight and Short-Term for older people and children residing in the four small areas within the study area as listed below:

- Fingal - 267005001/02 and 267099021; and
- County Meath - 167025001/03 and 167025001/03.

The significance of impact, in the absence of mitigation, will be Negative, Not Significant and Short-Term for all other small areas in the study area.

#### 6.4.2.4 Air Quality

As identified in Chapter 7 (Air Quality) in Volume 2 of this EIAR, construction activities with the potential to generate dust emissions include excavation of the proposed cable trench (including the creation of temporary lay down areas, Passing Bays and Joint Bays), the laying of the proposed cable circuit, formation of Temporary Construction Compounds (TCCs) / Horizontal Directional Drilling (HDD) Compounds, and upgrades to Belcamp Substation and Woodland Substation. The majority of the Proposed Development will be located within rural areas where there are relatively few nearby residents or users of community facilities. However, the Proposed Development will pass through some settlements and more populated areas including:

- Baskin / Glebe, on the northern outskirts of Dublin City, immediately east of the M1 Motorway Junction 2 (Fingal);
- Northern outskirts of Hollystown, Fingal;
- Southern outskirts of Kilbride, County Meath; and
- Northern outskirts of Dunboyne, County Meath.

The construction dust assessment presented in Chapter 7 (Air Quality) assesses construction dust impacts associated with cable laying for a relatively populated area of the proposed cable route in Hollystown, and concludes that there will be a negligible or low risk of human health impacts associated with construction activities in the absence of mitigation. Risks to human health associated with TCC3 (which was chosen due to its more sensitive location near Hollystown) were also assessed as having negligible to low risk of human health impacts, and those associated with construction works at Belcamp Substation and Woodland Substation were also assessed as having low or negligible risk. Construction dust emissions may present an annoyance in more heavily populated areas as previously described, but this would be of temporary duration and immediately reversible following cessation of construction activities, and so, the magnitude of impact is assessed as low and the significance of impact is assessed as Negative, Slight and Short-Term for small areas 268121002 and 268122003 (Dublin City) and 267099015/01 (Fingal) and Negative, Not Significant and Temporary for all other small areas.

#### 6.4.2.5 Noise

A total of 43 residential dwellings and three nursing homes (Dunboyne Nursing Home (Harlockstown, Dunboyne, Meath), Anovocare Nursing Home (Cloghran, Fingal) and New Park Care Centre (Fingal)) are expected to experience increases in noise levels of 65 decibels (dB) (LAeq (the continuous equivalent sound level)) or greater during construction, with 27 of those expected to experience noise increases of that level during both Phase 1 (installation of Joint Bays and Passing Bay structures) and Phase 3 (installation and jointing of cables) (see Section 4.5 of Chapter 4 (Proposed Development Description) in Volume 2 of this EIAR) of the construction works and Section 9.4 of Chapter 9 (Noise and Vibration) in Volume 2 of this EIAR). The nature of the construction works is such that there will be a rolling programme, for example, cable duct laying is anticipated to progress at a rate of 40m to 50m per day. This will minimise the duration of exposure for residents of nearby houses and users of community facilities to relatively short periods of time in the majority of cases. Therefore, with the exception of eight residential dwellings which will experience noise levels of 65dB LAeq during construction at the HDD1a and 1b and HDD2a and 2b Compounds at the proposed M3 and M2 Motorway crossings for a period of around 54 days, the duration over which effects will be experienced would be less than 10 days in total for each phase of works. Night working is not proposed on a routine basis, although some elements of construction (HDD crossings for example) have the potential to occur outside of normal working hours (i.e., Monday to Friday 07:00hrs to 19:00hrs and 08:00hrs to 14:00hrs on Saturdays).

Traffic diversion routes implemented during construction will also result in increases in noise exposure for residents. Table 9.13 of Chapter 9 (Noise and Vibration) shows that significant noise impacts are anticipated during one or more phases of construction for nine of the proposed diversion routes. However, these impact will be temporary in nature (maximum duration of 134 days or less than four months for proposed Diversion

Route 1.2, and less than 56 days or two months for all other diversion routes). The locations of the proposed diversion routes are shown in Figure 14.2 in Volume 4 of this EIAR.

No changes in myocardial infarction (heart attack) morbidity are anticipated given the temporary nature of construction related and traffic diversion noise exposure anticipated and impacts on sleep disturbance are also anticipated to be minimal given that night working is not routinely required. Construction related noise, including that associated with traffic diversions, is likely to give rise to annoyance and adversely affect quality of life for nearby residents and users of nearby community facilities and places of employment, but given the temporary duration of exposure, reversibility of the impact, and the fact that the majority of affected residential locations (including nursing homes) are located along or in close proximity to Dublin Airport or to motorways and regional roads within the study area, the magnitude of impact is considered to be low. The significance of impact is therefore assessed as either Negative, Slight and Short-Term (small areas 268121002 and 268122003 (Dublin City), 267099015/01 and 267066001 (Fingal)), or Negative, Not Significant and Temporary for all other small areas).

### **6.4.3 Operational Phase**

#### **6.4.3.1 Open Space, Leisure and Recreation**

No permanent land take will be required from areas of open space or facilities used for leisure and recreational purposes, and there will be no potential impacts on this determinant during the Operational Phase. Therefore, there will be no impact on health associated with this determinant.

## **6.5 Mitigation and Monitoring Measures**

All mitigation measures set out in Section 6.5.1 and Section 6.5.2 are included in the Construction Environmental Management Plan (CEMP), which is included as a standalone document in the planning application pack.

### **6.5.1 Construction Phase**

A potential Negative, Moderate and Short-Term health impact on the farming community has been identified as a result of the Construction Phase. The following mitigation measures set out in Section 15.5 of Chapter 15 (Agronomy and Equine) in Volume 2 of this EIAR will be implemented in full to provide support to the farming community likely to be affected by the Proposed Development:

- The appointed contractor will be required to maintain close liaison with local community representatives and landowners and farmers to provide them with adequate progress information and advance notice of works. This will ensure that construction activities are planned around the reasonable access needs of the landowner, so that access is maintained when required by the landowner for farming activities, such as for example, forage and crop harvesting, fertiliser spreading, slurry spreading, and herding of livestock etc. Scheduling of works will be agreed with each landowner to facilitate the operation of the farm and minimise disturbance. Where it is necessary to move livestock along public roads or across the working area, this will be facilitated by the appointed contractor; and
- Where the working area severs land access or access to farmyards, the appointed contractor will ensure that there is adequate access provided to facilitate the farmer to effectively farm severed land.

These mitigation measures will provide farmers with information and support and give them the opportunity to be included in the planning of activities. This will help to reduce uncertainty and allow them to plan their operations more effectively throughout the Construction Phase.

No significant health impacts were identified for the population in the study area as a whole. The following mitigation measures will be implemented to help further reduce the impacts on human health:

- The CEMP, which is included as a standalone document in the planning application pack will be implemented;
- The following mitigation measures set out in Section 14.5 of Chapter 14 (Traffic and Transport) in Volume 2 of this EIAR, will be implemented:
  - An adopted, regulated and approved Construction Traffic Management Plan (CTMP) (refer to Appendix B of the CEMP which is included as a standalone document in this planning application pack) will be implemented;
  - Signed diversion routes will be provided to mitigate journey disruption and to minimise potential driver delay. These are outlined in Chapter 14 (Traffic and Transport) but will be subject to final agreement with the Roads Authorities. Where practically achievable, diversion routes will not apply outside of the working area hours of operation; and
  - Construction activity generated vehicles will travel on predefined construction access routes to and from the relevant working areas to reduce the effects on local traffic.
- Mitigation measures set out in Section 7.5 of Chapter 7 (Air Quality) in Volume 2 of this EIAR, including:
  - 'Highly recommended' measures for 'medium risk' dust soiling impacts, as identified in the Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (Version 2.1) (IAQM 2023), will be implemented.
- Mitigation measures set out in Section 9.5 of Chapter 9 (Noise and Vibration), including:
  - Noise barriers will be installed around the HDD1 and HDD2 Compounds and acoustic enclosures will be placed around HDD plant; and
  - British Standard (BS) 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Noise (BSI 2014) will be complied with.

In addition, the following specific mitigation measures have been identified for human health and will be implemented during the Construction Phase:

- All proposed traffic diversion routes will remain suitable for walkers, cyclists and horse riders as well as motorised vehicles if these user types are known or anticipated to make use of the closed route;
- A Community Liaison Officer will be engaged who will act as a single point of contact for members of the community who may have concerns about construction related activities, collate data regarding issues raised by members of the community to enable them to be addressed, and who will act to resolve concerns in a timely manner;
- The Community Liaison Officer will be contacted either via telephone or by a suitable online feedback mechanism; and
- There will be specific liaison between the appointed contractor's Community Liaison Officer and the following facilities to develop targeted mitigation measures which will help to minimise adverse effects associated with increased traffic flows on nearby roads:
  - Scoil Bhríde, Kilbride Road, Kilbride;
  - Dunboyne Nursing Home, Harlockstown, Dunboyne; and
  - Anovocare Nursing Home, Stockhole Lane, Cloghran.

## 6.5.2 Operational Phase

No health impacts are anticipated during the Operational Phase, and therefore no mitigation or monitoring measures are required.

## **6.6 Residual Impacts**

### **6.6.1 Construction Phase**

Table 6.11 presents the predicted residual impacts on human health during the Construction Phase, following the implementation of the mitigation measures outlined in Section 6.5.1.

**Table 6.11: Predicted Residual Impacts on Human Health**

Determinant (Construction Phase)	Potential Impact		Mitigation that will be implemented	Predicted Residual Impact	
	Magnitude	Significance of Impact		Magnitude of Impact	Significance of Impact
Open space, leisure and recreation	Negligible (all populations)	Negative, Imperceptible and Temporary (all populations).	<ul style="list-style-type: none"> <li>Mitigation measures set out in Section 7.5 of Chapter 7 (Air Quality), including those listed under Air Quality mitigation in Section 6.5.1 of this Chapter; and</li> <li>Mitigation measures set out in Section 9.5 of Chapter 9 (Noise and Vibration), including those listed under Noise and Vibration mitigation in Section 6.5.1 of this Chapter.</li> </ul>	Negligible (all populations)	Negative, Imperceptible and Temporary (all populations)
Employment and income	Negligible (general population in all small areas) Medium (farming population in all small areas)	Neutral, Imperceptible and Short-Term (general population in all small areas). Negative, Moderate and Short-Term (farming population in all small areas).	Mitigation measures set out in Section 15.5 of Chapter 15 (Agronomy and Equine), including those listed under Agronomy mitigation in Section 6.5.1 of this Chapter.	Negligible (general population in all small areas) Low (farming population in all small areas) (note: number of farm holdings experiencing moderate adverse effects reduced to two following implementation of mitigation, see Section 15.6 of Chapter 15 (Agronomy and Equine) for further detail).	Neutral, Imperceptible and Short-Term (general population in all small areas) Negative, Slight and Short-Term (farming population in all small areas)
Transport modes, access and connections	Low	Negative, Slight and Short-Term for children and older people resident in small areas: Fingal - 267005001/02 and 267099021 County Meath - 167025001/03 and 167025001/03. Negative, Not Significant, Short-Term (all other small areas)	<ul style="list-style-type: none"> <li>Mitigation measures set out in Section 14.5 of Chapter 14 (Traffic and Transport), including those listed under Traffic and Transport mitigation in Section 6.5.1 of this Chapter; and</li> <li>Mitigation measures as set out for human health in Section 6.5.1 of this Chapter, including the provision of Community Liaison Officer.</li> </ul>	Low	Negative, Not Significant and Short-Term (all populations)
Air quality	Low (all populations)	Negative, Slight and Short-Term (small areas 268121002 and 268122003 (Dublin City) and 267099015/01 (Fingal)) Negative, Not Significant and Temporary (all other small areas)	Mitigation measures set out in Section 7.5 of Chapter 7 (Air Quality), including those listed under Air Quality mitigation in Section 6.5.1 of this Chapter.	Low (all populations)	Negative, Not Significant and Temporary (all populations)

Determinant (Construction Phase)	Potential Impact		Mitigation that will be implemented	Predicted Residual Impact	
	Magnitude	Significance of Impact		Magnitude of Impact	Significance of Impact
Noise and vibration	Low (all populations)	Negative, Slight and Short-Term (small areas 268121002 and 268122003 (Dublin City), 267099015/01 and 267066001 (Fingal)) Negative, Not Significant and Temporary (all other small areas)	Mitigation measures set out in Section 9.5 of Chapter 9 (Noise and Vibration), including those listed under Noise and Vibration mitigation in Section 6.5.1 of this Chapter.	Low (all populations)	Negative, Slight and Temporary (all populations)

## 6.6.2 Operational Phase

No residual impacts on the open space, leisure and recreation health determinant are anticipated during the Operational Phase for the reasons described in Section 6.4.3.1.

## 6.7 Conclusion

The Proposed Development will not generate any Significant (Significant, Very Significant or Profound) impacts on human health during the Construction and Operational Phases. Construction works will affect two agricultural land holdings (land parcels no. 33 and 40 as outlined in Chapter 15 (Agronomy) in Volume 2 of this EIAR) to the extent that will require moderate changes to the management and operation of their businesses in the long-term. However, this is not considered likely to change the availability of employment or income levels locally to the extent that a population level health effect is likely. Regular communication and support for individuals directly affected by construction (mainly members of the farming community) will help them to better understand the proposals and plan ahead with regard to their farming activities, which is an important factor in helping to protect mental wellbeing. There will be some disruption along routes used to access community facilities by motorised vehicle, or changes in amenity of routes used by walkers and cyclists, due to carriageway or road closures required to facilitate construction works. This will result in changes in traffic patterns on the local road network. However, these will be short-term in nature, and with mitigation in place, they will not affect access to leisure and recreational facilities, places of study, employment or healthcare facilities or reduce physical activity levels, such that changes in morbidity or quality of life are anticipated. Similarly, whilst construction activities will result in noise and dust emissions, due to the rural nature of the majority of the proposed cable route and rolling construction programme, such impacts are at worst likely to result in annoyance and psychosocial distress at on a temporary to short-term, reversible basis.

## 6.8 References

- Bartley M, Ferrie J, Montgomery SM. (2005). Chapter 5: Health and labour market disadvantage: unemployment, non-employment and job insecurity. *Social Determinants of Health 2nd Edition*. Oxford University Press: Oxford.
- Barton, H. and Grant, M. (2006). A health map for the local human habitat. *The Journal for the Royal Society for the Promotion of Health*, 126 (6).
- Bassett D, Pucher J, Buehler R, Thompson D and Crouter S. (2008). Walking, cycling, and obesity rates in Europe, North America and Australia. *Journal of Physical Activity and Health*. Vol. 5, pp795-814.
- British Medical Association. (2012). Healthy transport = Healthy lives. [Online] Available from <https://www.bma.org.uk/collective-voice/policy-and-research/public-and-population-health/transport>. [Accessed 14 February 2024].
- BSI (2014). BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Noise Central Statistics Office (2019). *The Wellbeing of the Nation (2017)*. [Online] Available from <https://www.cso.ie/en/releasesandpublications/ep/p-wbn/thewellbeingofthenation2017/hlt/>. [Accessed 14 February 2024].
- CSO (n.d.) Census 2022 Small Area Population Statistics (SAPS). [Online]. Available from <https://www.cso.ie/en/census/census2022/census2022smallareapopulationstatistics/> [Accessed 14 February 2024].
- CSO (2023). *Census Interactive Mapping* [Online]. Available from <https://visual.cso.ie/?body=entity/ima/cop/2022> [Accessed 14 February 2024].



Dahlgren, G. and Whitehead, M. (1991). What Can Be Done About Inequalities in Health? *Lancet*, 338(8774): 1059-1063.

Department of Health (2013). *Healthy Ireland- a framework for health and wellbeing 2013-2025*. Dublin: Department of Health.

Department of Health (2022). *Health in Ireland: Key Trends*. Available from [gov.ie](http://gov.ie) - [www.gov.ie](http://www.gov.ie) - [Health in Ireland Key Trends 2022 \(www.gov.ie\)](http://www.gov.ie). Accessed 14 February 2024.

Department for Work and Pensions (2017). *Improving Lives, Helping Workless Families*.

Environmental Protection Agency (n.d.). *EPA Maps* [Online]. Available from: <https://gis.epa.ie/EPAMaps/> [Accessed 14 February 2024].

EPA (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports* [Online]. Available from [Guidelines on the information to be contained in Environmental Impact Assessment Reports \(EIAR\) \(epa.ie\)](http://www.epa.ie). [Accessed 14 February 2024].

EPA (2023). *Air Quality.ie*. [Online] Available from <https://airquality.ie> [Accessed October 2023].

European Commission (2017). *Guidance on the preparation of the environmental impact assessment report (Directive 2011/92/EU as amended by 2014/52/EU)* [Online]. Available from <https://op.europa.eu/en/publication-detail/-/publication/2b399830-cb4b-11e7-a5d5-01aa75ed71a1>. [Accessed 14 February 2024].

Foldspang A, Birt CA, Otok R. (2018) *ASPHER's European List of Core Competences for the Public Health Professional*. 5th Edition (preliminary). Brussels, Belgium: Association of Schools of Public Health in the European Region (ASPHER) [Online]. Available from [https://www.aspher.org/download/199/04-06-2018\\_aspher\\_s\\_european\\_list\\_of\\_core\\_competences\\_for\\_the\\_public\\_health\\_professional.pdf](https://www.aspher.org/download/199/04-06-2018_aspher_s_european_list_of_core_competences_for_the_public_health_professional.pdf). [Accessed December 2023].

Health and Safety Executive (HSE) (2015a). *Health Profile 2015 Dublin City* [Online] Available from [Dublin+City.pdf;jsessionid=02831D7AD21503CEF11AA7A338E8BF99 \(lenus.ie\)](http://www.lenus.ie). Accessed 14 February 2024.

HSE (2015b). *Health Profile 2015 Dublin Fingal* [Online] Available from [Dublin+Fingal.pdf \(lenus.ie\)](http://www.lenus.ie). Accessed 14 February 2024.

HSE (2015c) *Health Profile 2015 Meath*. [Online] Available from [Meath.pdf \(lenus.ie\)](http://www.lenus.ie). Accessed 14 February 2024.

Institute of Air Quality Management (IAQM) (2023). *Guidance on the Assessment of Dust from Demolition and Construction (Version 2.1)*.

Institute of Environmental Management and Assessment (2022a). *IEMA Guide to: Effective Scoping of Human Health In Environmental Impact Assessment* [Online] Available from [IEMA - Launch of the EIA guidance for considering impacts on human health - November 2022](http://www.ienema.ie). Accessed 14 February 2024.

Institute of Environmental Management and Assessment (2022b). *IEMA Guide to: Determining Significance For Human Health In Environmental Impact Assessment* [Online] Available from [IEMA - Launch of the EIA guidance for considering impacts on human health - November 2022](http://www.ienema.ie). Accessed 14 February 2024.

International Association for Impact Assessment (IAIA) and European Public Health Association (EUPHA) (2020). *Human health: ensuring a high level of protection. A reference paper on addressing Human Health in Environmental Impact Assessment*. As per EU Directive 2011/92/EU amended by 2014/52/EU [Online] Available from [Human Health Ensuring Protection Main and Appendices.pdf \(eupha.org\)](http://www.eupha.org) Accessed 14 February 2024.

Kavanagh, P., Doyle, C., Metcalfe, O. (2005). Health Impacts of Transport: A Review. Institute of Public Health in Ireland.

Pobal (2023). Pobal HP Deprivation Index Scores – 2022 [Online] Available from: [Pobal HP - Deprivation Index Scores - 2022 - Dataset - data.gov.ie](#). Accessed 14 February 2024.

Public Health England (2020). Improving access to greenspace. A new review for 2020. p. 112.

Pyper, R., Cave, B., Purdy, J. and McAvoy, H. (2021). Health Impact Assessment Guidance: A Manual. Standalone Health Impact Assessment and health in environmental assessment. Institute of Public Health. Dublin and Belfast.

National Transport Authority (NTA) (2022). Greater Dublin Area Cycle Network [Online] Available from [2022-GDA-Cycle-Network.pdf \(nationaltransport.ie\)](#). Accessed 14 February 2024.

NTA (2022). Draft Ireland's Cycle Network [Online] Available from [CycleConnects | National Transport Authority Consultation Portal](#). Accessed 14 February 2024.

Rose, DC., Bradley, F., O'Connor, D., Hall, J., Morrison, R., Mulkerrins, M., Nye C., and Russell, T. (2023) The mental wellbeing of young farmers in Ireland and the UK: driving factors, help-seeking, and support, *Scottish Geographical Journal*, DOI: 10.1080/14702541.2023.2274004

Stapleton, A; Russell, T; Markey, A; McHugh, L (2022). Dying to Farm: National-Level Survey Finds Farmers' Top Stressor is Government Policies Designed to Reduce Climate Change. figshare. Poster. <https://doi.org/10.6084/m9.figshare.21681377.v1>

World Health Organisation (WHO) (2018). Environmental noise guidelines for the European Region [Online] Available from [Environmental noise guidelines for the European Region \(who.int\)](#). Accessed 14 February 2024.

WHO (2018). Environmental noise guidelines for the European region: a systematic review on environmental noise and cardiovascular and metabolic effects: a summary [Online] Available from: [IJERPH | Free Full-Text | WHO Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Cardiovascular and Metabolic Effects: A Summary \(mdpi.com\)](#). Accessed 14 February 2024.

WHO (2021). WHO global air quality guidelines: particulate matter (PM10 and PM2.5), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide [Online] Available from [WHO global air quality guidelines: particulate matter \(PM2.5 and PM10\), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide](#). Accessed 14 February 2024.

WHO (2022). Social Determinants of Health [Online] Available from <https://www.who.int/health-topics/social-determinants-of-health>

### Directives and Legislation

Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014, amending Directive 2011/92/EU of the European Parliament and the Council of 13 December 2011 on the assessment of the impacts of certain public and private projects on the environment (EIA Directive).

S.I. No. 296/2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018