

## 15 Health in Environmental Impact Assessment

### Introduction

- 15.1 The amended Environmental Impact Assessment (EIA) Directive (2014/52/EU), transposed into UK regulations by the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017, requires under Part 1, (4), (2)(a) the consideration of the likely significant direct or indirect effects of projects on 'population and human health'.
- 15.2 Health in Impact Assessment (HIA) is a tool for assessing the likely effects of Proposed Projects, both positive and negative, on the health and wellbeing of the population. With no statutory guidance for assessing health impacts, the approach to HIA remains flexible and scalable to meet individual project requirements, which will be determined by the nature of the proposal, timescales involved and resources available.
- 15.3 Due to the nature of the Proposed Project, it is not proposed to undertake a detailed HIA as part of the Environmental Assessment Report and therefore it will not contain a standalone Chapter relating to this topic. Instead the following section of the Scoping Report has been prepared using existing desk-based knowledge and accessible evidence base to signpost where human health will be considered as part of the Environmental Assessment process. To inform this a high-level baseline community profile has been prepared to identify potential receptors.

### Guidance/ Signposting

- 15.4 Whilst there is no prescriptive or statutory method for scoping 'population and human health', whilst preparing the baseline community profile and signposting to where human health will be assessed in the Environmental Assessment guidance has been drawn from the following sources:
- A short guide to Health Impact Assessment: Informing Healthy Decisions (NHS Executive London, 2000);
  - Wales Health Impact Assessment Support Unit (WHIASU) Health Impact Assessment: A Practical Guide (2012); and
  - WHIASU Screening / Scoping Checklist (2012).
- 15.5 The guidance offered by WHIASU has been developed and refined through practice as part of the Policy, Research and Development Division of Public Health Wales, and constitutes good practice and justification for adopting such methods and guidance when undertaking a scope of potential health impacts.

### Policy

- 15.6 Policy relevant to HIA includes:
- Planning Policy Wales: Edition 9 (2016) which states 'consideration of the possible impacts of developments – positive and/or negative – on people's health at an early stage will help to clarify the relevance of health and the extent to which it needs to be taken into account'.
  - The National Policy Statement (NPS) for Electricity Networks Infrastructure (EN-5) which provides specific policy in relation to electromagnetic fields (EMF) and their known and potential effects on health applies to nationally significant infrastructure projects determined by the Planning Inspectorate but is applicable to projects producing EMF. EN-5 states '*All overhead power lines produce EMFs, and these tend to be*

*highest directly under a line, and decrease to the sides at increasing distance. Although putting cables underground eliminates the electric field, they still produce magnetic fields, which are highest directly above the cable. EMFs can have both direct and indirect effects on human health. The direct effects occur in terms of impacts on the central nervous system resulting in its normal functioning being affected. Indirect effects occur through electric charges building up on the surface of the body producing microshock on contact with a grounded object, or vice versa, which, depending on the field strength and other exposure factors can range from barely perceptible to being an annoyance of even painful.*

- Anglesey and Gwynedd Joint Local Development Plan 2011-2026 which sets out the strategy and aims for development and land use in the area covered by the Anglesey and Gwynedd Planning Authorities over the plan period 2011-2026. The plan aims to have significant influence on development within the whole area. One of the key matters within the plan is 'Well-Being', with the plan aiming to address the following:
  - *'Promote opportunities for people to live healthy lives and have reasonable access to healthcare, especially within an ageing population.*
  - *Areas of high levels of various types of deprivation*
  - *Need to maintain or improve residents' sense of safety within and outside their homes*
  - *Access to facilities and community services, leisure facilities and formal and informal entertaining along with access to the countryside.*

Anglesey and Gwynedd Authorities hope the plan period will realise *'a home to vibrant networks of inclusive communities where residents enjoy good health and wellbeing'*.

15.7 Snowdonia National Park Authority Local Development Plan 2007-2022 which has a vision that *'By 2035, Snowdonia will continue to be a protected and evolving landscape, safeguarded and enhanced to provide a rich and varied natural environment; providing social, economic and well-being benefits nationally and internationally'*. Policies relating to health include:

- Strategic Policy A: National Park Purposes and Sustainable Development, this policy seeks to ensure that new development promotes the principles of sustainable development in ways which further National Park purposes and duties whilst conserving and enhancing the National Park's 'Special Qualities'. In particular to health, it states *'iii. safeguarding and improvement of the health, safety, economic and social well being of local communities'*.
- Development Policy 1: General Development Principles (1). This policy aims to preserve and enhance the 'Special Qualities' and purpose of the National Park, and development will only be permitted, if the following applies (in relation to health):

*ix. The traffic implications of the development do not result in volumes or types of traffic which will create highway or safety problems on the local road network, or significantly harm the landscape or amenity of local people.*

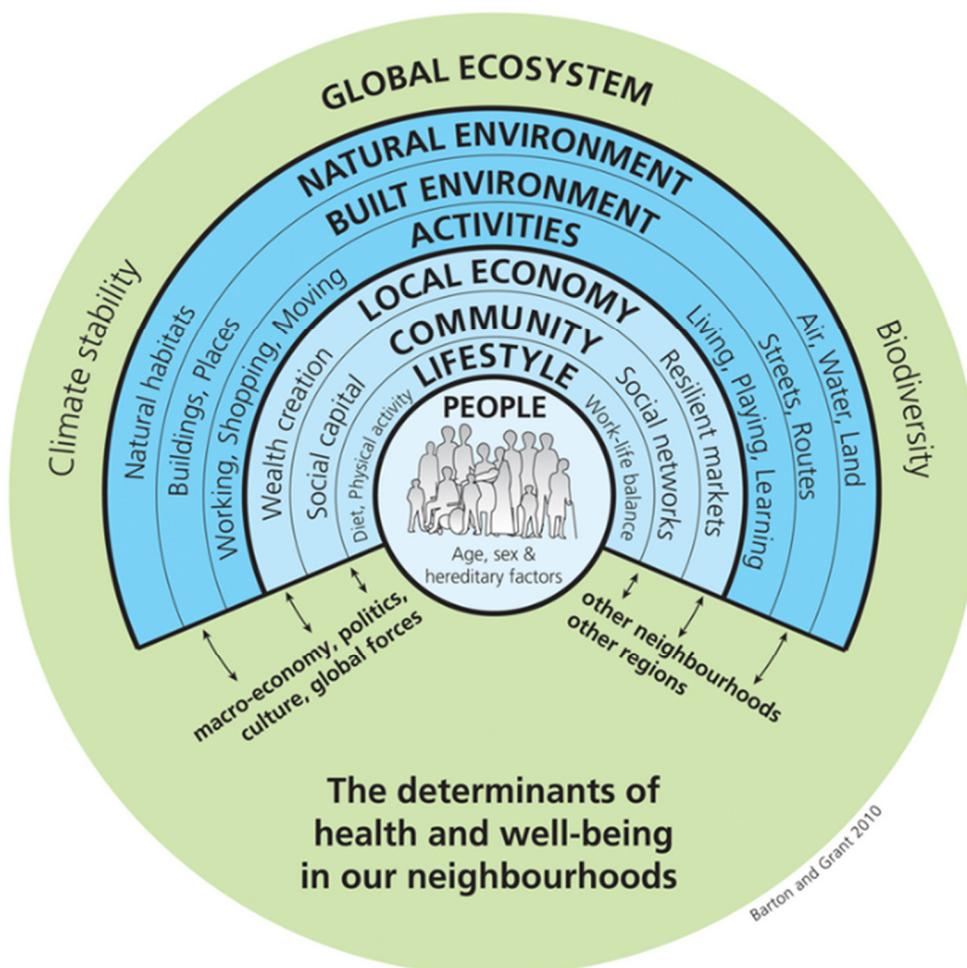
*xi. The development will not have an unacceptable adverse impact, through increased resource use, discharges or emissions, on public health, surface and groundwater (quality, quantity or ecology), air quality, soil and the best and most versatile agricultural land.*

*xii. The development is compatible with, and does not cause significant harm, to the environment, neighbouring residential amenity or the amenity of the Park by way of noise, dust, vibration, odour, light pollution, hazardous materials or waste production.*

## Baseline Environment

- 15.8 With no statutory definition of 'health', a widely accepted definition is offered by the World Health Organisation (WHO) as '*a state of complete physical, social and mental wellbeing, and not merely the absence of disease or infirmity*.'
- 15.9 The determinants of health are well reported and accepted. Health determinants can be described as lifestyle (diet, physical activity, alcohol consumption etc.), social and community influences (social isolation, culture, social support etc.), living/environmental conditions (built environment, housing, noise, air and water quality etc.), economic (unemployment, income, workplace conditions etc.), access and quality of services (medical services, public amenity, education etc.) and macro-economic (government policies, economic development, climate etc.). Whilst this offers a broad view, no one list of health determinants can be totally exhaustive, owing to the cross-cutting nature of human health. Figure 15.1 illustrates a common model which summarises these determinants:

**Figure 15.1 The 'Determinants of Health Model' - A Socio-Economic Model of Health**



## Health/ Community Profile

- 15.10 The baseline data takes account of relevant Lower Super Output Areas (LSOAs)<sup>1</sup>, Middle Layer Super Output Areas<sup>2</sup> (MSOA), regional and national statistics. This provides context for the Scoping Report as they provide the most specific reporting of local area statistics. The areas under consideration are:
- Harlech LSOA (W01000074);
  - Penrhyndeudraeth 1 LSOA (W01000100);
  - Penrhyndeudraeth 2 LSOA (W01000101);
  - Portmadog East LSOA (W01000105);
  - Gwynedd MSOA (W02000022);
  - Gwynedd Unitary Authority; and,
  - Wales.
- 15.11 A total or an average of all LSOA statistics have been reported, unless specified. Where it has not been possible to report information at a LSOA level, information has been gathered in succeeding geographical order (Gwynedd MSOA, Gwynedd Unitary Authority).
- 15.12 The 2011 Census remains the most complete source of information regarding community characteristics. Information has been derived from the 2014 Indices of Multiple Deprivation, Health Map Wales, Public Health Wales Observatory, NOMIS Labour Market Profiles, Gwynedd Well-Being Assessment (2017) and Topic Papers (Joint Local Development Plan Background Papers) to supplement the census data.
- 15.13 All values are quoted from the 2011 Census unless stated otherwise.

## Population

- 15.14 Based on the 2011 Census, the population for the LSOAs was 6348 residents. This equated to approximately 5.2% of the total population of the Gwynedd Unitary Authority. There are an almost equal proportion of males and females within the LSOAs population, with males 49.6% and females 50.4%. This is consistent with Gwynedd MSOA (49.1%, 50.9%) and Wales (49.3%, 50.7%).

## Density

- 15.15 Population density gives a measure of the number of people living within an area. The area is predominantly rural, with no major towns or cities within the vicinity of the Proposed Project, with the exception of Porthmadog. Based on the 2011 Census, the average population density for the LSOAs is 1.7 people per hectare, with the highest density in Porthmadog East (3.8) and the lowest in Harlech and Penrhyndeudraeth 1 (0.3). This is higher than the overall population density for Gwynedd Unitary Authority (0.4).

## Age

- 15.16 The age profile of a community/population can help to indicate future trends, ageing populations and the requirement of the next generation. Based on the 2011 Census, the percentage of people aged 16-64 is 59.9% for the LSOAs with little deviation. This is consistent with Gwynedd MSOA (57.5%), Gwynedd Unitary Authority (62%) and Wales

<sup>1</sup> Lower Super Output Areas are a sub-ward geography generated to be as consistent in population size as possible (minimum 1000 with a mean of 1500 for England and Wales). They are the smallest geography available for the small area statistics.

<sup>2</sup> Middle Super Output Areas are a sub-ward geography generated from contiguous LSOAs (minimum population of 5000 and mean of 7200).

(61.7%). The average percentage of people aged 65+ is 22.8% for the LSOAs, which is consistent with Gwynedd Unitary Authority (21%) and lower than Gwynedd MSOA (28%).

- 15.17 The percentage of the population who are under 16 years of age decreased every year between 2001 and 2011 in Gwynedd Unitary Authority. There has been a significant decrease in the number of individuals within this age category<sup>3</sup>, with 15% less children under 16 in the area than there were 30 years ago<sup>4</sup>.
- 15.18 The number of people aged over 80 has more than doubled in the last 30 years, coupled with a substantial increase in people aged 40-80.
- 15.19 The Gwynedd Well-Being Assessment (2017) states that there will be 60% more people aged over 80 living in Gwynedd in the next twenty years, compared to 2% increase in people aged 16-64.

### **Ethnicity**

- 15.20 Gwynedd Unitary Authority comprises predominantly white people, with 2.4% of people who say they are from a non-white background.

### **Education, Skills and Training**

- 15.21 Education, skills and training are important socio-economic factors with potential to influence a person's lifestyle, self-efficacy, employment, income and quality of housing and health. The percentage of people aged 16+ with no qualifications is higher for the LSOAs (16.4%) than the national average for Wales (9.6%). The percentage of people aged 16+ with a Level 4 qualification or higher is also lower for the LSOAs (24.9%) than the national average for Wales (36.1%).

### **Employment and Income**

- 15.22 The percentage of people in employment (aged 16+) is 72.9% for the LSOAs. This is consistent with Gwynedd Unitary Authority (69.5%) and Wales (72.1%). The number of unemployed people (aged 16+) is 5.2%, which is marginally lower than Gwynedd Unitary Authority (6.5%) and Wales (7.1%).
- 15.23 In 2017, the average weekly earnings for people living in Gwynedd Unitary Authority were £431.40, which is lower than the national average for Wales (£505.90).
- 15.24 The median household income for Gwynedd Unitary Authority in 2013 was £22,111, which was lower than the national average for Wales (£24,713).

### **Indices of Multiple Deprivation**

- 15.25 All values stated are quoted from the Indices of Multiple Deprivation 2014 unless stated otherwise.

#### **Overall Multiple Deprivation**

- 15.26 The Welsh Indices of Multiple Deprivation is the Welsh Governments official measure of relative deprivation for small areas (LSOAs) in Wales, ranked out of an overall total of 1909 LSOAs in Wales (1 being most deprived and 1909 being the least). It is designed to identify small areas where there are the highest concentrations of several different types of deprivation. Deprivation is the lack of access to opportunities and resources which we might expect in our society. The Indices of Deprivation are informed by a weighted sum of eight domains including; health (14%) and geographical access to services (10%). In general

<sup>3</sup> Populations and Housing Topic Paper

<sup>4</sup> Gwynedd Well-Being Assessment (2017)

terms, it is widely accepted that where people live affects their health and wellbeing, therefore, the more deprived an area, the higher the risk of adverse health and wellbeing impacts upon a population. However, the issue isn't linear as certain protective factors such as social networks and connectivity all play a part in an individual's health and wellbeing.

- 15.27 None of the four LSOAs were in the 10% most deprived areas in Wales, with three being in the 50% least deprived (average rank 1228/1909). Porthmadog East is ranked 926/1909, which places it just within the 50% most deprived areas in Wales.

### **Health Deprivation**

- 15.28 The health deprivation domain is one of the eight domains that inform the overall deprivation score and is used to measure lack of good health, using indicators such as; limiting long-term illness, all cause death rate, cancer incidence and low weight single births.
- 15.29 In terms of health, none of the four LSOAs were within the 10% most deprived areas in Wales, with all four being within the 50% least deprived areas for health. The average ranking is 1450/1909.

### **Access to Services Deprivation**

- 15.30 The access to services domain is one of the eight domains that inform the overall deprivation score and is used to capture deprivation as a result of a household's inability to access a range of services considered necessary for day-to-day living, using indicators such as; average of public and private travel times to GP surgeries, pharmacies, leisure centres and for food shops.
- 15.31 The average ranking for the four LSOAs is 498.75 which is within the 50% most deprived areas in Wales in relation to access to services. Two of the four LSOAs (Harlech and Penrhyndeudraeth 1) were only just above the 10% most deprived areas ranking. Porthmadog East ranks high with 1820/190.

### **Life Expectancy**

- 15.32 The average life expectancy for Gwynedd MSOA is 79.5 years for males and 84.9 years for females. This is consistent with that for Gwynedd Unitary Authority (78.8, 83.1) and Wales (78.2, 82.2). The gap in life expectancy at birth between those who are most and least privileged in Gwynedd's communities is significantly less than for the rest of Wales.

### **Summary**

- 15.33 The information indicates a slowly ageing population, sharing an equal proportion of males and females, within the immediate and surrounding areas of Gwynedd.
- 15.34 Whilst the percentage of people with no qualifications was higher than regional and national average for the LSOAs as a whole, the employment and unemployment rates were either consistent or higher than regional and national figures. However, lower rates of qualification may limit an individual's opportunity for higher paid employment. The average weekly earnings and mean household income for Gwynedd Unitary Authority was consistently lower than national average.
- 15.35 With exception to 'access to services' there are relatively low levels of overall deprivation within the surrounding area, suggesting a lower risk to factors with potential to impact on population health and wellbeing. This is reflected in the 'health' domain for deprivation, which sees a high average ranking of 1450 out of 1909 LSOAs. This is also reflected in the life expectancy for both males and females being consistent with regional and national figures.
- 15.36 Notwithstanding the above information, there is an apparent issue with access to vital services. Connectivity can greatly influence one's ability to function on a day to day basis such as access to employment and healthcare. The Gwynedd Well-Being Assessment

(2017) reported that, for the Porthmadog area, 31% of respondents reported lack of public transport/ connections and 52% of respondents reported lack of shops on the high street. This is coupled with the predominantly rural nature of the surrounding area, with a reported average population density of just 1.7 persons per hectare.

- 15.37 Overall, the baseline information does not highlight any one particular vulnerable or 'at risk' group of people within the surrounding community.

## Potential Impacts

- 15.38 In assessing potential health impacts, the effect of a Proposed Project on health determinants has to be considered. This is done by defining health 'pathways'. A health pathway is a means by which a project may exert influence on a known determinant of health, which arises as consequences of planned activities or project 'features'. In relation to the Proposed Project, the following topics were considered as having potential to either negatively or positively affect human health:

- During construction and decommissioning:
  - Noise and Vibration
  - Air Quality
  - Contaminated Land/ Water (including waste)
  - Traffic and Transportation
  - Socio-economic
- During operation:
  - Noise and Vibration
  - Socio-economic
  - Electro Magnetic Fields

## Proposed Assessment Methodology

- 15.39 The Environmental Assessment Report will cover the above topics within individual topic chapters. Their relationship to health is summarised below.

### Noise and Vibration (during Construction and Operation)

- 15.40 Elevated environmental noise has the potential to cause health impacts such as hearing impairment, hypertension, ischemic heart disease, annoyance, and sleep disturbance. A construction and operational noise and vibration assessment will be undertaken for the Proposed Project. The assessment will follow BS 5228 Part 1 (British Standards Institute, 2014) which provides the methodology for assessing noise impacts on human receptors. The noise levels derived in BS5228 have been set taking into account human health parameters. Construction noise mitigation will be by means of the application of best practice, as set out in BS 5228. This will be formalised in the CEMP. This is likely to include agreement of working days and hours, working methods, plant and techniques, and potentially permitted noise levels which construction works should comply with.

### Air Quality (during Construction)

- 15.41 Particulate matter mainly generated from combustion and construction activities, can adversely affect human health in varying degrees depending on its size, composition, origin and the length of exposure.

- 15.42 Dust emissions can irritate the eyes and aggravate pre-existing respiratory problems, such as asthma.
- 15.43 Exposure to nitrogen dioxide (NO<sub>2</sub>) is associated with exacerbation of pre existing respiratory conditions, such as asthma, with long term exposure and reduced lung function.
- 15.44 A Construction Environmental Management Plan (CEMP) will be prepared for the Proposed Project to manage the effects of construction activities on air quality. Best practice mitigation will be used during construction to reduce the effect of dust and emissions including but not limited to the following:
- wheel cleaning facilities will be provided and road sweeping will be undertaken in accordance with the Construction Traffic Management Plan which will be prepared for the planning submission;
  - materials that have a potential to produce dust will be removed from site as soon as possible, unless being re-used on site. Where there is a requirement to temporarily store dusty materials they will be sheeted or prevented in some other way from becoming wind-borne;
  - loaded vehicles that are carrying dust generating materials will be covered, for example with sheets, when leaving site to prevent escape of materials during transport;
  - where activities could create dust clouds, dust suppression techniques will be adopted, for example water sprays and dampening of access roads. Suppression techniques will be used more frequently during periods of dry weather;
  - the site speed limit will be signposted and will not exceed 10mph;
  - there will be no burning of materials on site;
  - all plant and vehicles will be maintained in good order so that they do not emit dark smoke, grit or dust;
  - the use of diesel generators will be minimised and battery powered generators will be used where available;
  - engines will be turned off when vehicles are not in use to avoid 'idling';
  - alternative methods for business travel will be considered by all employees to reduce vehicle use; and
  - all working areas will be kept in a clean and tidy condition.
- 15.45 No emissions will be emitted to air during the operational phase of the Proposed Project with the exception of vehicles used for maintenance purposes.

### **Waste and Contamination (during Construction)**

- 15.46 Improper waste management and illegal waste handling can have negative impacts on both environmental and public health. Negative impacts can be due to inappropriate handling and disposal activities resulting in soil, water or air pollution. Leaks from waste may contaminate soils and water bodies, and produce air pollution through emissions. Other nuisances caused by uncontrolled or mismanaged waste disposal which may affect communities include localised impacts such as landscape deterioration, and littering.
- 15.47 The degree of health impacts experiences by people or communities is often dependant on the siting of waste handling facilities or those in the vicinity of mismanaged waste practices (fly tipping etc.).
- 15.48 A ground conditions assessment will be carried out as part of the Environmental Assessment Report (see Section 8 of the Screening and Scoping Report) and will address the potential

for encountering contaminated land. In addition, a CEMP will be prepared for the Proposed Project to manage the effects of construction activities on the surrounding environment. Best practice waste management and pollution prevention measures will be used to reduce the potential impacts of contamination on the surround environment and human health. The CEMP will also detail measures for encountering unexpected contaminated land during construction activities.

15.49 No waste will be generated during the operational phase of the Proposed Project.

### **Traffic and Transport (during Construction)**

15.50 Transport plays a vital role in promoting health by providing communities with access to a range of services and amenities required to treat ill-health and to manage and promote healthy living. Maintaining links and networks to encourage and maintain relationships and connection with people is important, as a lack of social relationships can heighten susceptibility to illness. It is therefore important to maintain community connectivity, to prevent social isolation and employment commuting routes.

15.51 Transport can have a negative impact on health due to injuries and death through road traffic accidents. Traffic generated noise and air pollution may result in respiratory and cardiovascular problems, nervousness, sleeplessness and irritability.

15.52 A traffic and transport assessment will be carried out following 'Guidelines for the Environmental Assessment of Road Traffic - Institute of Environmental Assessment (IEA), 1993 (now the Institute of Environmental Management and Assessment (IEMA))'. In accordance with these Guidelines the effects which would be assessed (should a threshold impact be identified), are:

- severance;
- driver delay;
- pedestrian and cycle delay;
- pedestrian and cycle amenity;
- fear and intimidation;
- Road safety; and,
- Hazardous loads.

15.53 The above topics identified from the guidelines are the key parameters for potential health effects and are therefore already addressed in the Environmental Assessment Report.

15.54 Minimal traffic movements will be generated during the operational phase of the Proposed Project.

### **Socio-Economic (during Construction and Operation)**

15.55 A socio-economic assessment will be undertaken for the Proposed Project (see Section 13 of the Screening and Scoping Report) and will consider effects on tourism, access, amenity and employment.

15.56 The construction phase of the Proposed Project is likely to give rise to negative (although temporary) amenity effects through increased noise and vibration, traffic and visual effects. Conversely, the construction phase of the Proposed Project will create a source of employment and local revenue through the use of the local workforce, local services and suppliers. Employment and income are regarded as key determinants of health, influencing where an individual lives, the education received, access to healthcare and even lifestyles and behaviour. Unemployment is directly linked with poorer health (and vice versa).

- 15.57 Increased employment opportunities can have a positive influence on health through increase social contact, and by forming social relationships.
- 15.58 During the operational phase of the Proposed Project there is the potential for the Proposed Project to bring about benefits to the amenity of the local area through pylon and OHL removal, which would be experienced by residents and tourist alike.

### **Electric and Magnetic Fields (during Operation)**

- 15.59 Section 11 of this Screening and Scoping Report focuses on Electric and Magnetic Fields, which concludes that no significant effects from EMFs from the Proposed Project are expected, it is, therefore, proposed that the assessment of EMFs is scoped out of the Environmental Assessment Report. National Grid, however, recognises public concern regarding EMFs and therefore wishes, despite scoping EMFs out of the Environmental Assessment Report, to provide all the relevant information on EMFs as part of the planning application submission (to be submitted 2019).

### **Proposed Mitigation Measures**

- 15.60 Please refer to the following sections of this report for any proposed mitigation associated with the key topics for which health forms the basis of the assessment:
- Noise (Section 14 of this report);
  - Air Quality (Section 10 of this report);
  - Contaminated Land/ Water (including waste) (Section 8 of this report);
  - Traffic and Transportation (Section 12 of this report);
  - Socio-economic (Section 13 of this report); and,
  - Electro Magnetic Fields (Section 11 of this report).

### **Issues to be Scoped Out**

- 15.61 Due to the nature of the Proposed Project, it is not proposed to prepare a stand alone Chapter relating to HIA.
- 15.62 Individual topic chapters covering noise and vibration, ground conditions, traffic and transport and socio-economic will be prepared as part of the Environmental Assessment Report which consider human receptors. In addition, a CEMP and a standalone report on EMF will be prepared.

### **Overview of the Likely Significance of Effect**

- 15.63 From the information currently available, it is not anticipated that the Proposed Project will give rise to significant effects.