

15 HEALTH

15.1 Introduction

- 15.1.1 This Chapter, prepared by Arup, reports the likely significant effects of the Proposed Development in terms of Health in the context of the Site and surrounding area. In particular, it assesses the beneficial and adverse health and wellbeing effects associated with changes to health determinants resulting from the Proposed Development.
- 15.1.2 This Chapter (and its associated appendices) is not intended to be read as a standalone assessment and reference should be made to the front end of this ES (Chapters 1 – 6), as well as the final chapters, ‘Summary of Residual and Cumulative Effects’ and ‘Conclusions’ (Chapters 21 - 22).

15.2 Legislation, Policy and Guidance

- 15.2.1 The relevant legislation, policy and guidance are listed below.

Legislative Framework

- 15.2.2 The applicable legislative framework is summarised as follows:

Public Health (Wales) Act 2017

- 15.2.3 This legislation aims to address specific health concerns, and to create conditions which are conducive to good health and avoid harm. The legislation places a requirement to ensure that public bodies carry out health impact assessments in times when policies, plans or programmes have outcomes of national or major significance, or which have a significant effect at the local level on public health.

Active Travel (Wales) Act 2013

- 15.2.4 The act aims to make active travel the most attractive option for most shorter journeys. Journeys are considered short when cars can be left behind and they can be undertaken via active travel. It wants to ensure more people undertake active travel so that physical activity levels and health benefits are accrued. The act requires:

- *Local authorities to produce active travel maps and deliver year on year improvements in active travel routes and facilities.*
- *Highway authorities to make enhancements to routes and facilities for pedestrians and cyclists in all new road schemes and to have regard to the needs of walkers and cyclists in a range of other highway authority functions.*

- *Welsh ministers and local authorities to promote active travel journeys*

The Well-being of Future Generation (Wales) Act 2015

15.2.5 This legislation sets a requirement for public bodies to consider improving social, economic, environmental and cultural well-being of Wales. The legislation aims to create a society which maximises people's physical and mental wellbeing and includes goals to create:

- a compassionate nation;
- an active nation;
- place making and designing-in community health and wellbeing that supports health communities; and
- seamless, preventative organisations and services that benefit health.

Planning Policy

15.2.6 The applicable planning policy is summarised as follows:

Future Wales: The National Plan 2040 (February 2021)

15.2.7 Future Wales – The National Plan 2040 sets out the direction for development in Wales to 2040. It is a development plan with a strategy for addressing key national priorities through the planning system, including improving the health and wellbeing of Welsh communities.

Planning Policy Wales (Edition 11, February 2021)

15.2.8 The Planning Policy for Wales aims to deliver the vision set out in the Wellbeing of Future Generations Act. A key planning principle as part of this document is to facilitate accessible and healthy environments, which includes creating high quality and inclusive environments in which people can live, work, travel and play.

Cardiff Local Development Plan 2006 – 2026 (Adopted January 2016)

15.2.9 Policy KP14 Healthy Living: supports the creation of a healthier place to live in, reducing health inequalities by encouraging healthy lifestyles, addressing the social determinants of health and providing accessible health care facilities. The policy supports developments which provide active travel and accessible green spaces.

15.2.10 Policy C6 Health: supports reducing health inequalities and encouraging healthy lifestyles. It ensures the physical and built environment supports active travel choices, promotes healthy lifestyles, supports interconnectivity and enhances road safety. The

Community section of the Plan also includes a number of other relevant policies relating to the provision and protection of open space, the creation of safe environments and the provision of recreation, sport and play opportunities.

Cardiff Council Supplementary Planning Guidance ‘Planning for Health and Well-being’ (2017)

15.2.11 The supplementary planning guidance provides information on how decisions made in planning can impact on the health and wellbeing of the population. It includes information on addressing inequalities, well-being goals, and appropriate location for health care facilities.

Cardiff and Vale University Health Board ‘Shaping Our Future Wellbeing Strategy 2015 – 2025’

15.2.12 This strategy sets out the Cardiff and Vale University Health Board’s approach to healthcare in the region. It seeks to deliver healthy lifestyles for people across the region and sets a number of objectives including reducing health inequalities; improving health and wellbeing; reducing harm and waste sustainably and supporting people in choosing healthy behaviours.

Cardiff Public Services Board ‘Cardiff Well-being Plan 2018 – 2023’ (2017)

15.2.13 The Cardiff Wellbeing Plan sets out the priorities for action for the period between 2018 and 2023 for Cardiff. The five wellbeing objectives include:

- a capital city that works for Wales;
- Cardiff grows in a resilient way;
- safe, confident, and empowered communities;
- Cardiff is a great place to grow up; and
- supporting people out of poverty.

Cardiff’s Transport White Paper: Transport Vision to 2030 (January 2020)

15.2.14 The transport vision to 2030 includes the vision for the city in terms of transport and how it will be delivered. This includes:

- expanding on metro plans for new tram-train routes and stations;
- implementing Bus Rapid Transit services and Park & Ride sites, and making bus travel far cheaper; and
- re-prioritising streets to give more space to people walking and cycling.

Guidance

15.2.15 The applicable guidance is summarised as follows:

Rapid Health Impact Assessment Tool, National Health Service (NHS) London Healthy Urban Development (Unit) (HUDU) (2019)

15.2.16 HUDU work with local and national organisations across the UK on behalf of the NHS to enable health and planning sectors to work together. The HUDU tool is designed to assess the likely health impacts of development plans and proposals and identifies those determinants of health which are likely to be influenced by a specific development proposal.

IMPACT Urban Health Impact Assessment methodology, Liverpool University (2015)

15.2.17 The IMPACT methodology sets out a process for assessing health effects and improving health outcomes and provides information and guidance for completing every step of the HIA.

Wales Health Impact Assessment Support Unit (WHIASU) Health Impact Assessment – A practical guide (2011)

15.2.18 The WHIASU Guidance describes the process and methods used to undertake a health assessment and provides resources to support the assessment. It includes checklists for identifying the health determinants and vulnerable groups relevant to the health assessment being undertaken.

Wales Health Impact Assessment Support Unit ‘Complete Quality Assurance Review Framework for Health Impact Assessment (HIA)’ (2017)

15.2.19 An appraisal tool used to review the quality of HIAs. It aims to strengthen the practice and use of HIA in Wales to maximise the benefits and minimise the risks to health and wellbeing of policies, programmes, services, and developments.

Health in Environmental Impact Assessment: A Primer for a Proportional Approach (Institute of Environmental Management and Assessment, 2017)

15.2.20 An overview providing guidance and recommendations for public health teams, EIA practitioners, planning officers, consultees, consenting authorities and other

concerned with population and human health during screening, scoping, consultation, assessment, reporting and monitoring of health in EIA.

15.3 Assessment Methodology and Significance Criteria

Scope of the Assessment

15.3.1 Health determinants are factors that can influence health outcomes and include social, environmental, and economic factors. The health determinants most considered within health assessments, and recommended by the various guidance available, include the following:

- housing design and affordability
- access to health and social care services and other social infrastructure
- access to open space and nature
- air quality, noise, and neighbourhood amenity
- accessibility and active travel
- crime reduction and community safety
- access to healthy food
- access to work and training
- social cohesion and inclusive design
- climate change

15.3.2 The assessment considers groups of people who will potentially be affected by the Proposed Development including:

- construction workers
- residents living in close proximity to the Site
- residents of the new housing provision
- people working in close proximity to the Site (e.g. Pierhead Street)
- people working in the new leisure, retail, food and beverage, and entertainment spaces
- vulnerable people i.e. older people, children, young people, people with ill health, people with disabilities etc.

Effects Not Considered within the Scope

15.3.3 Cardiff Bay is a popular area for visitors; however, they are not considered within the assessment as it is not possible to determine the health profile of this group. As they

are only likely to visit the area for short periods of time, exposure to any health impacts is not considered likely to be significant and they are not considered within the scope.

- 15.3.4 Most potential health effects cannot be reliably quantified because: there are currently no robust or scientifically widely agreed upon methods for quantifying them; or because the assessment of health effects has been scoped out.

Extent of the Study Area

- 15.3.5 The study area for the health assessment has been defined by the geographic area over which impacts on health determinants are likely to occur. This varies between the health determinants – for example construction noise impacts will be local to the construction site, whereas impact on employment opportunities will be assessed at a wider level.
- 15.3.6 The baseline profile includes data at the ward level (Butetown) (see Figure 15.2) and at the Lower Super Output Area (LSOA) level. The Lower Super Output Area (LSOA) level represents smaller populations and is therefore more representative of the population close to the Proposed Development. Data for LSOAs was collected for LSOAs surrounding/adjacent to the LSOA for which the Proposed Development is located within (Cardiff 048B). Note that as the Proposed Development falls mainly within Cardiff 048B therefore, this was the LSOA used for setting adjacent LSOAs to include within the LSOA study area. Figure 15.2 illustrates a schematic of the LSOAs included within the study area.
- 15.3.7 Regional (Cardiff) and National (Wales) data is also included in some instances for comparison to the local (LSOA) and wider (ward) profiles. This allows for comparison of baseline characteristics at different spatial scales.

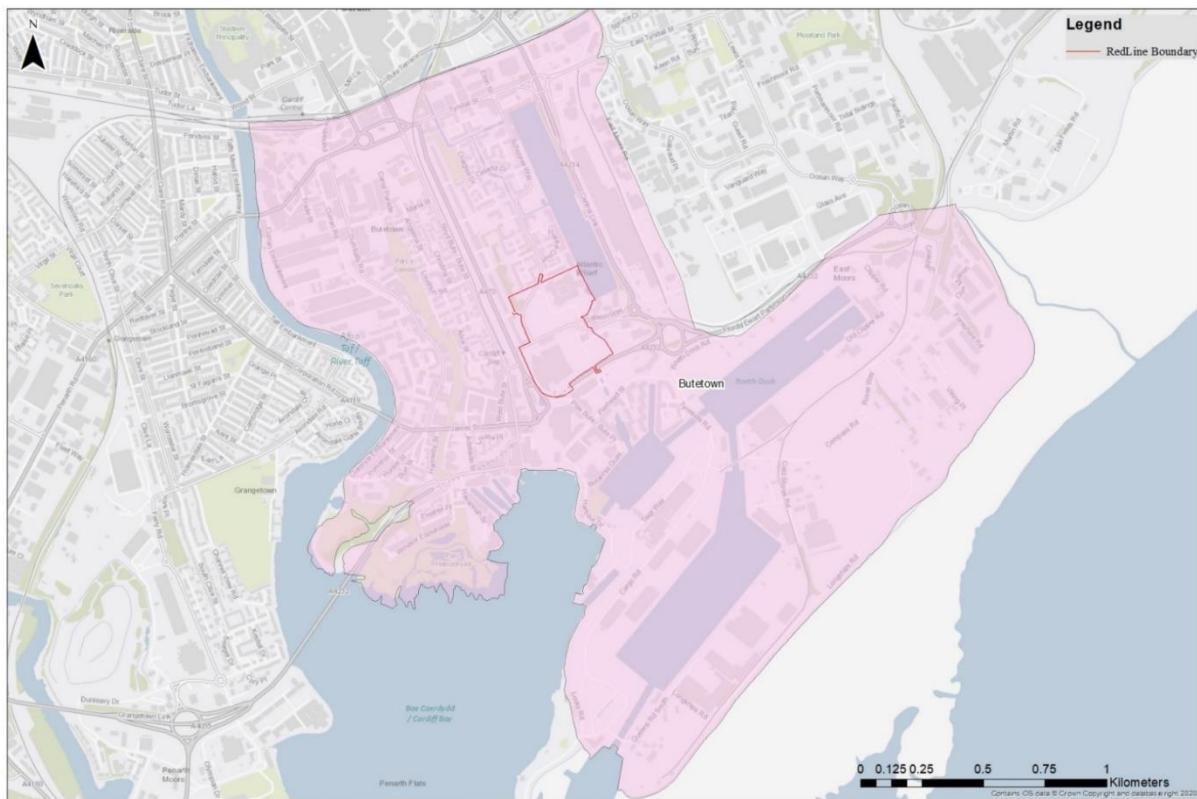


Figure 15.1 Ward Study Area

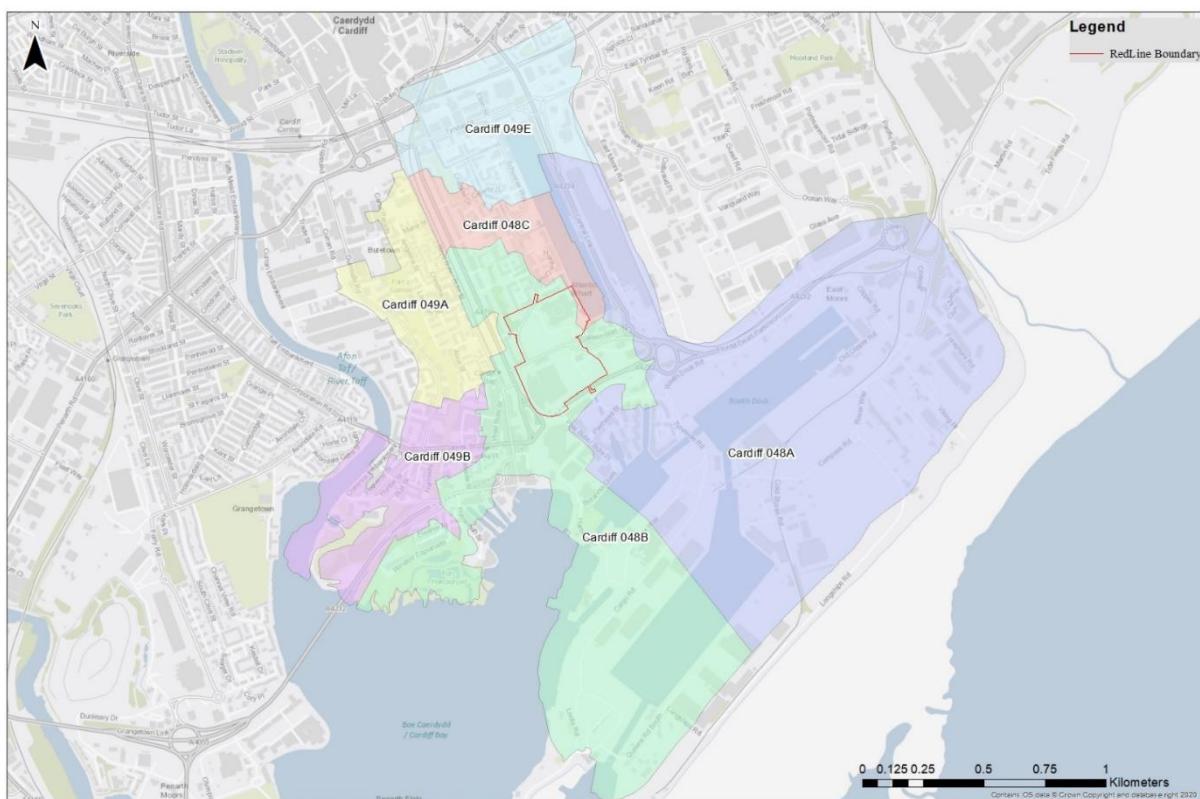


Figure 15.2 LSOA Study Area

Consultation Undertaken to Date

15.3.8 An EIA Scoping Report was prepared and submitted to Cardiff Council on 17th June 2021. The EIA Scoping Report sets out the proposed scope for the assessment of health. No further consultation comments were received during the preparation of the health assessment.

Baseline Methodology

15.3.9 The baseline consists of a community profile of the area surrounding the Site. This is set out in Appendix 15.1 and summarised in Section 15.4.

15.3.10 Using publicly available data, the community profile presents a summary of the demographic, social and health characteristics of the population. Sources include Office of National Statistics (ONS) census and mid-year data, Public Health Welsh Index of Multiple Deprivation 2019, InfoBase Cymru, Health Map Wales, Ordnance Survey, StatsWales, and NHS Wales Informatic Services. Public Health Observatory was not available for collation of data at the time of writing as the website was under construction.

15.3.11 No primary data gathering has been undertaken for the assessment.

15.3.12 The community profile provides an overview of the population's resilience to health effects, and the prevalence and distribution of vulnerable sub-groups who may be more sensitive to changes in health determinants (e.g. deprived communities, people with existing health problems or disabilities, older people and children).

Evidence Review

15.3.13 To make informed assessments about how changes in health determinants resulting from the Proposed Development are likely to influence health outcomes of the study population, it is important to understand what the scientific consensus is in relation to health determinants. An evidence review has therefore been carried out based on

available primary¹, secondary² and grey³ literature. The evidence presented underpins the qualitative judgements on health outcomes made in the assessment. Appendix 15.2 sets out the full methodology followed for conducting the evidence review.

Assessment Methodology

15.3.14 The method of baseline data collection and assessment is in accordance with current guidance and industry best practice.

15.3.15 The health and wellbeing assessment is based on the identification of ‘health determinants’, i.e. the social, economic and environmental factors that can influence the health and wellbeing of a population. A qualitative assessment of the likely significant health effects has been carried out, based on the level of exposure of the population to changes in health determinants. The assessment identifies potential impacts related to the different stages of development (i.e. construction and operation) and identifies whether these would result in changes to health determinants that would be beneficial or adverse, direct or indirect and long-term or temporary. It also takes into account any mitigation measures embedded into the design of the Proposed Development. The approach for defining significance considers:

- the magnitude of the impact on a health determinant (exposure)
- the sensitivity of the population exposed to the impact.

15.3.16 The level of population exposure is defined by the size of the population exposed to an impact which is judged on a scale of high, medium, and low, dependent on geographical area and number of people exposed. The vulnerability of the population is also judged on a scale of high, medium and low. Decisions on vulnerability are based on the baseline data collated for the study area and depends on the health determinant under consideration. More vulnerable populations include those with higher levels of social deprivation or relatively poor health status (Table 15.1).

¹A primary source is also called an original source and is any source of information that was created at the time under study. Secondary sources are typically based on primary sources.

²A secondary source is a source that documents an event, period, or issue in history that was produced after the event, period or issue has happened. These include textbooks and literature reviews.

³Grey literature comprises information produced on all levels of government, academia, business and industry in electronic and print formats not controlled by commercial publishing. Examples of grey literature include government reports, policy statements and issues papers.

Table 15.1 Guidelines for the assessment of population exposure and vulnerability		
Rating	Guidelines	
	Population exposure	Population vulnerability
High	A high level of exposure would occur over a wide geographical area and/or be likely to affect a large number of people (e.g. over 500).	Affected population includes a higher than national average proportion of vulnerable or disadvantaged groups (such as children or older people) who are more likely to experience adverse health effects as a result of the impact in question.
Medium	A medium level of exposure would occur over a relatively localised area and/or be likely to affect a moderate-large number of people (e.g. 100-500).	Affected population includes an average or close to average proportion of vulnerable or disadvantaged groups who are more likely to experience adverse health effects as a result of the impact in question.
Low	A low level of exposure would over a small, local area and/or affect a small number of people (e.g. fewer than 100).	Affected population includes a below average proportion of vulnerable or disadvantaged groups who are more likely to experience adverse health effects as a result of the impact in question.

15.3.17 The overall sensitivity of the study population to changes in health determinants depends on the level of exposure and the vulnerability of the population to those changes.

15.3.18 Population exposure and population vulnerability are combined to give an overall judgement on population sensitivity, on a scale of high, medium, or low, as show in Table 15.2.

Table 15.2 Population sensitivity matrix			
		Population vulnerability	
Population exposure	High	Medium	Low
High	High	High	Medium
Medium	High	Medium	Low
Low	Medium	Low	Low
Negligible	Low	Low	Low

15.3.19 The assessment identifies the beneficial and adverse effects of the Proposed Development on human health and describes measures to avoid or reduce any adverse impacts.

Significance Criteria

15.3.20 To determine overall significance of impact, the assessment matrix provided in Table 15.3 was used. This classifies significance of health impacts as major, moderate, or minor. Where no magnitude of impact is observed, a negligible health effect is observed. For the purpose of the EIA, a significant impact is defined as any health impacts identified as moderate and above.

Table 15.3 Significance of impact

Magnitude of impact	Population sensitivity		
	High	Medium	Low
High	Major	Major	Moderate
Medium	Major	Moderate	Minor
Low	Moderate	Minor	Minor

15.4 Baseline Conditions

15.4.1 A review of publicly available data has been undertaken to provide a baseline of the demographic, health, and wellbeing status of the population around the Proposed Development. The baseline consists of a community profile of the area surrounding the Site. This is set out in Appendix 15.1 and summarised in Section 15.4.2. Refer to Section 15.3.3 – 15.3.6 for an explanation of the geographic areas that were used to compile the baseline.

Sensitive Receptors

15.4.2 People living within the study area represent the sensitive receptors in terms of health determinants and any changes to these determinants. However, when considering different groups within the population, the groups listed in the Table 15.4 are considered to be particularly sensitive to changes. Based on the health profile set out in Appendix 15.1 a view on the extent to which these sensitive receptors are likely to be within the study area is given.

Table 15.4 Sensitive groups within the study area

Sensitive groups	Study area baseline	Population vulnerability
Age related groups <ul style="list-style-type: none"> • Older people • Children and young people 	<p>The majority of the study population falls within working ages of 16-64 with a lower than average number of older (65+) people. The study area as a whole has similar proportions of children as the Cardiff average; however, Butetown, the ward in which the Proposed Development sits has significantly fewer children.</p>	Low
Income related groups <ul style="list-style-type: none"> • Low income • Economically inactive • Unemployed/workless • People unable to work due to ill health 	<p>In relation to income levels the study area varies between being in the 50% least deprived to 10% most deprived areas. This is mirrored in regard to educational attainment and employment.</p> <p>Health within the study population shows similar variation with the majority of the LSOAs being within the 50% least health deprived Cardiff 049A being in the 10% most health deprived decile.</p>	Medium
Groups who potentially experience discrimination or other social disadvantage <ul style="list-style-type: none"> • Disabled • Refugees/asylum seekers • Travellers • Single parent families • LGBTQ+ • Black Minority ethnic groups • Religious groups 	<p>Levels of disability within the study area appear to be lower than the average for Cardiff (13% day to day activities limited a lot or a little compared to 18% for Cardiff).</p> <p>The study area is ethnically diverse with 69% of residents identifying as White compared to 85% and 96% in Cardiff and Wales respectively. Black/African/Caribbean/Black British residents make up the largest minority ethnic group at 9.3% followed by Asian/Asian British at 8.9%⁴. Data from the 2011 Census identifies the study area to include a higher than average percentage (25%) of Muslims than the Cardiff percentage (6.8%). There are also two Islamic centres in the study area (South Wales Islamic Centre and Imam Ali Centre).</p> <p>There is no data available on numbers of refugees/asylum seekers, single parent families, LGBTQ+.</p>	<p>Religion = High</p> <p>Ethnic diversity = High</p> <p>Disabled = Low</p> <p>Other groups = unknown</p>

⁴ Nomis (ONS) Census 2011: Ethnic group (KS201EW)

Limitations and assumptions

- 15.4.3 The assessment draws on the assessment outputs from other disciplines within the ES (Socio-economics (Chapter 14), Air Quality (Chapter 11), Noise and Vibration (Chapter 12), Traffic and Transport (Chapter 7), Townscape and Visual Amenity (Chapter 16), Climate Change (Chapter 17)) that are relevant to the health determinants scoped in to the health assessment.
- 15.4.4 The assessment considers the residual impacts identified by the above disciplines, that is, after mitigation measures, such as landscape planting, have been taken into account. It also assumes that any mitigation outlined by these topics would be effective. The findings from these assessments inform the judgements made within the assessment.
- 15.4.5 Literature and baseline data used in the health assessment is limited to readily available public and published sources.
- 15.4.6 The community profile uses data from the 2011 Census, which despite being ten years old at the time of this assessment, provides the most full and reliable dataset. The 2021 Census data was not available at the time of writing.
- 15.4.7 The assessment of health effects is qualitative, based on professional judgement and drawing on available qualitative and quantitative information.
- 15.4.8 The health assessment identifies the impacts on the determinants of health, but there is less certainty regarding the resulting health effects of that impact as it is often dependent on a range of other factors. For example, the proposed development may improve opportunities for active travel, but the uptake of those opportunities by the population is less certain due to the individual choices people make.

15.5 Assessment of Effects

Housing design and affordability

- 15.5.1 There has been a range of evidence presented for the effects of housing quality and design on health. A systematic review of housing interventions concluded that high quality, well designed housing and improvements to the quality and design of housing can lead to health benefits (refer to Appendix 15.2 for evidence).

Construction

- 15.5.2 During the construction phases, there will be no impact on housing design and affordability and therefore no change in health outcomes is predicted in relation to this health determinant.

Operation

- 15.5.3 The Proposed Development will provide 1,000 – 1,100 mixed size and tenure residential dwellings, across three quarters. All residential units will be apartments, 20% of which will have 1 – bedroom, 70% will have 2 – bedrooms and 10% will have 3 bedrooms. Additionally, there will be a housing tenure mix of 80% market and 20% affordable housing apartments ensuring accessibility to housing for all residents.
- 15.5.4 The baseline profile identified that the local area is variably deprived in terms of housing, with majority of LSOAs falling within the 50% least deprived of LSOAs within Wales but some LSOAs (Cardiff 049A and Cardiff 049B) falling within the top 10% most deprived LSOAs in Wales. The provision of new high-quality housing will be particularly attractive for residents who are most deprived in the housing domain however, housing conditions and access to housing may also be improved for other residents in the local and wider area.
- 15.5.5 The impact on housing will result in a low magnitude impact as the introduction of new market rate and affordable housing will improve the housing quality and affordability of the local and wider community. The population sensitivity is assessed as high based on:
- High population exposure: due to large number of residents who will access the new housing infrastructure across the community
 - Medium population vulnerability: due to the variable levels of housing deprivation across the area
- 15.5.6 Therefore, this is likely to result in a **moderate beneficial** health effect, which is **significant**.

Access to health and social care services and other social infrastructure

- 15.5.7 Evidence shows that access to public services and social infrastructure such as health, education and community facilities has a direct positive effect on human health (refer to Appendix 15.2 for evidence).

Construction

- 15.5.8 The Proposed Development does not currently include any healthcare services or social infrastructure which will be affected during construction over the five proposed phases of development. The local community surrounding the Site will also not have their access to existing services and infrastructure affected during the construction period. Therefore, no health effects are predicted in relation to this health determinant.

Operation

- 15.5.9 The Proposed Development is in Cardiff Bay which has access to health and social care services that are available to all residents of Cardiff. Cardiff Bay provides access to pharmacies, groceries, butchers, cafes, barbers and supermarkets including a Tesco and Sainsburys. For new residents within the proposed apartment blocks, these existing services will be available and within easy access. Additionally, the Proposed Development will introduce 14,500sqm of leisure floorspace, 2,750sqm of retail space and 9,800sqm of food and drink space. The details on the exact uses are not known at this stage however, it is likely to include a range of shops, cafes, restaurants, and venues. The introduction of this social infrastructure will ensure that the basic needs of residents coming into the Bay area are met. This will also improve the access to social infrastructure for existing residents and provide a space for residents in the local community to interact and access basic needs.

- 15.5.10 Butetown Medical Practice is located within Butetown Health Centre and serves residents within the study area, closest to the Proposed Development. The practice website currently states that they are not taking on new registrations for the next six months. However, this is likely to change by 2032 when the Proposed Development is expected to be completed. Further, there seems to be sufficient GP capacity in the wider study area, as identified in the Socioeconomic Assessment (Chapter 14). Analysis of GP surgeries within a one-mile radius of the Proposed Development identified eight GP surgeries, all of which are accepting patients. A total of 60,150 patients are registered across these surgeries, which collectively provide 37 GPs and

a GP-patient ratio of 1:1,626. Considering the provision standard of 1,800 patients per GP, 174 patients per GP on average, will be able to register in the future in the wider study area. Therefore, no effect on health is considered in terms of access to healthcare services.

15.5.11 There are a number of educational facilities that serve the local area. This includes a private nursery, primary schools, and tertiary colleges. The community within the study area will maintain access to these services and new residents are likely to have full access to them. The Socio-economic Assessment (Chapter 14) identified a surplus of 546 places compared to capacity in primary and nursery schools within a two-mile radius and a surplus of 753 places compared to capacity in secondary schools within a three-mile radius from the Proposed Development suggesting sufficient capacity within the wider area. Therefore, no effect on health is considered in terms of access to educational facilities.

15.5.12 The impact on access to services will result in a low magnitude health impact as the introduction of new leisure, retail, food and beverage spaces will improve access to social infrastructure as these services will be more widely available in the immediate community. The population sensitivity is assessed as high based on

- High population exposure: due to large number of residents who will access the new infrastructure across the community
- Medium population vulnerability: due to the variable levels of accessibility across the population

15.5.13 Therefore, this is likely to result in a **moderate beneficial** health effect, which is **significant**.

Access to open space and nature

15.5.14 Evidence shows that the provision of greenspace can promote and protect good health, aid in the recovery of illness and help manage poor health (outcomes (refer to Appendix 15.2 for evidence). This is important for the consideration of both physical and mental health and wellbeing.

Construction

15.5.15 The construction of the Proposed Development will require the loss of the southern part of Silurian Park. It is assumed that the northern part of Silurian Park will remain accessible to the local and wider community. The nearest alternative public open

spaces include the Bute East Dock, Canal Park, Britannia Park, and Waterfront Park which are located approximately 5 – 13-minute walk away (see Appendix 15.1 for further information on baseline). However, people with reduced mobility will be less able to access the alternative parks and open spaces and will be most affected by the loss of the southern part of Silurian Park.

15.5.16 The magnitude of the impact is evaluated as low the northern part of Silurian Park will remain accessible during the construction period. The sensitivity of the population is assessed as high based on:

- Medium population exposure: relatively localised area and/or be likely to affect a moderate-large number of people
- High population vulnerability: due to high levels of deprivation according to the physical environment domain of the WIMD

15.5.17 Therefore, this is likely to result in a **moderate adverse** health effect, which is **significant**.

Operation

An Event Square ('Atlantic Square') (minimum 80m x 80xm) is proposed within the Atlantic Wharf, Butetown Masterplan, south of the Arena. This will offer a new destination for people within the study area, linking to the wider bay pedestrian areas. It will form part of the landscaping and public realm for the masterplan and allow for outdoor spill from surrounding food and beverage outlets. This publicly accessible space will host events such as seasonal markets and Winter Wonderland and will provide a space for gentle physical activity such as walking and playing on non-event days.

15.5.18 The proposed masterplan will be interspersed with public open space and public realm within all quarters. The landscaping plans include for areas of trees and green planting which will soften the landscape by providing a natural element. The proposed open spaces and public realm include the Arena Plaza, The Vista, Footbridge Walk, Eastern Gateway, Western Gateway, Hemingway Road, The Urban Arboretum, Waterside Residential and WMC Creative Space. These will aim to improve access to open space for individuals within the local and wider community and will aim to prioritise pedestrians and cyclists.

15.5.19 The wards within the study area predominantly sit within the 10% most deprived areas in terms of the physical environment domain (measure of the Welsh Index of Multiple Deprivation (WIMD)), which includes consideration of access to natural green space. Therefore, the introduction of the event square and improvement to public realm will be beneficial in improving access to green space. The facilitation of these publicly accessible open spaces within the Proposed Development will offer physical and mental health benefits to residents as they will have access to open space and an area for social interaction and gentle physical activity.

15.5.20 The magnitude of the impact is evaluated as medium as the Proposed Development will introduce a range of open space and public realm which will be accessible to the local and wider study area. The sensitivity of the population is assessed as high based on:

- Medium population exposure: relatively localised area and/or be likely to affect a moderate-large number of people
- High population vulnerability: due to high levels of deprivation according to the physical environment domain of the WIMD

15.5.21 Therefore, this is likely to result in a **major beneficial** health effect, which is **significant**.

Air quality, noise, and neighbourhood amenity

15.5.22 Evidence shows that good air quality, low noise levels and high-quality environments (i.e. neighbourhood amenity) positively affects health and wellbeing (refer to Appendix 15.2 for evidence).

Construction

Air Quality

15.5.23 The comprehensive air quality assessment of PM_{2.5}, PM₁₀ and NO₂ (see Chapter 11 of ES) concluded that there is likely to be medium risk impact to human health from demolition activities on site and low risk air quality impact to human health from earthworks, construction and trackout activities on site. Site-specific mitigation will be implemented to ensure dust effects from these activities will be not significant. This will include measures such as wheel washing system and water assisted dust sweepers. As such, the overall effect of the Proposed Development is considered to be not significant, and no health effects are considered to occur.

Noise

15.5.24 The comprehensive noise assessment (see Chapter 12 of ES) concluded that with the implementation of best working practice and restriction on working hours, the noise and vibration impacts of earthworks and construction phases will be generally negligible, with periods of adverse effects of slight to moderate significant in the short term and local level. The sensitivity of the sensitive receptors is moderate and with mitigation in place, the magnitude of change is none. Therefore, there is likely to be a direct, permanent, long-term residual effect on existing sensitive receptors of no significance. As such, the overall effect of the Proposed Development is considered to be not significant, and no health effects are considered to occur.

Neighbourhood amenity

15.5.25 The presence of a construction site can impact visual amenity. The comprehensive neighbourhood amenity assessment (see Chapter 16 of ES) concluded that significant adverse effects upon views are confined to receptors within short (typically immediate distance) of the Site. During construction of the Arena, Hotel, and Arena Plaza and subsequent construction of the Proposed Development across the remainder of the Site, significant adverse effects will be experienced by public rights of way users, residents bordering the Site, visitors and recreational users of the surrounding areas and road users passing the Site.

15.5.26 The impact on neighbourhood amenity will result in a medium magnitude impact due to the presence of a construction site however, this is downgraded to low as the visual impact of the construction site will be mitigated by the use of hoarding and by general good housekeeping measures set out in the CEMP. The population sensitivity is assessed as medium based on:

- Medium population exposure: relatively localised area and/or be likely to affect a moderate-large number of people
- Medium population vulnerability: due to high levels of physical environment deprivation but low levels of housing deprivation

15.5.27 Therefore, this is likely to result in a **minor adverse** health effect, which is **not significant**.

Operation

Air Quality

15.5.28 The comprehensive air quality assessment of PM_{2.5}, PM₁₀ and NO₂ (see Chapter 11 of ES) concluded that there is likely to be negligible effect on the existing sensitive human receptors. As such, the overall effect of the Proposed Development is considered to be not significant, and no health effects are considered to occur.

Noise

15.5.29 The comprehensive noise and vibration assessment (see Chapter 12 of ES) concluded that with the appropriate mitigation measures in place, the noise and vibration impact of the Proposed Development will be none in both the long and short term. As such, the overall effect of the Proposed Development is considered to be not significant, and no health effects are considered to occur.

Neighbourhood amenity

15.5.30 The comprehensive townscape and visual amenity assessment (see Chapter 16 of ES) concluded that the delivery of the Proposed Development will result in a beneficial impact in terms of improvements to the character of the townscape and visual amenity. This includes improvements to the legibility of the Site, public realm, natural focal points, and vistas through the development. The Site will also have improved visual and physical permeability and new landscaping will provide links between areas of public realm within and beyond the Site. As a result, beneficial effects will be observed for public rights of way users and visitors to the harbour and surrounding development. This is considered to improve neighbourhood amenity however, these impacts are not considered significant and therefore, no effect on health is considered to arise.

15.5.31 There will also be adverse effects arising from the greater density and larger heights of the Proposed Development buildings. This will alter the relationship between the Site and its surrounding urban setting, change the nature and composition skylines within the Site and from surrounding townscape, increase the presence of built environment which is currently not experienced within and in close proximity to the Site. Significant adverse effects will be observed for residents bordering / overlooking

the Site along Lloyd George Avenue and around Bute East Dock, including the DYZYN apartment blocks and visitors and recreational users around Bute East Dock.

15.5.32 This is considered to deteriorate neighbourhood amenity for these individuals, however, is considered to be of low magnitude. The population sensitivity is assessed as medium based on:

- Medium population exposure: relatively localised area and/or be likely to affect a moderate-large number of people
- Medium population vulnerability: due to high levels of physical environment deprivation and low levels of housing deprivation

15.5.33 Therefore, this is likely to result in a **minor adverse** health effect, which is **not significant**.

Accessibility and active travel

15.5.34 Evidence shows that being physically active as a result of engaging in active travel (walking and cycling) protects and improves health and wellbeing outcomes (refer to Appendix 15.2 for evidence). Living in accessible areas is also beneficial to health and wellbeing because it becomes easier for people to access public services, community facilities and be more socially connected.

Construction

15.5.35 The traffic and transport assessment (see Chapter 7 of the ES) identified that pedestrian and cyclist delay and amenity, public transport and driver delay and severance created by the construction process is negligible and the effect is not significant and therefore, no health effects are considered to arise.

Operation

15.5.36 The Proposed Development includes the provision of infrastructure to promote and support active travel choices for both local residents and those visiting the area. The masterplan will be a highly permeable scheme which enables pedestrian access along its boundaries. The orientation of public realm corridors and development plots attempts to make the most of the connection back to the waterfront, to offer views from the development and provide a strong pedestrian connection to reinforce the intention that the Atlantic Wharf site becomes an extension of the Inner Harbour area. A new pedestrian footbridge is also proposed over the A4232 at the southern extent of the Mixed-Use Quarter and will provide access to the Site from Pierhead Street and

the future transport hub. These measures are expected to create an attractive and secure environment which is conducive to active travel for pedestrians. This is consistent with the findings of the traffic and transport assessment (see Chapter 7 of ES) which found a moderate beneficial effect on pedestrians for perceptions of amenity, fear and intimidation (due to increase in traffic volumes and its proximity or lack of protection) during operation.

15.5.37 Crossing facilities will be provided at regular intervals along Schooner Way and will facilitate pedestrian movement at that location. Cycling will be encouraged through a proposed extension to the existing cycle superhighway plans along Lloyd George Avenue. Cycle parking (300 spaces) will be provided close to the Arena and hire bikes (nextbike) introduced into the area to add to the existing provision in Cardiff Bay. These measures are expected to create an attractive and secure environment which is conducive to active travel for cyclists. This is consistent with the findings of the traffic and transport assessment (see Chapter 7 of ES) which found a moderate beneficial effect on cyclists for perceptions of amenity, fear and intimidation (due to increase in traffic volumes and its proximity or lack of protection) during operation.

15.5.38 Vehicular access to the Arena will be restricted to only a VIP drop off, servicing and emergency access and otherwise the Arena will be car free. Spectators will be encouraged to access the Site via public transport and active travel, with spectators expected to utilise existing city centre car parks or Park and Ride Facilities with the last miles of journeys either involving public transport or active travel. The proposed MSCP in the Car Parking Quarter will however be constructed and operational prior to the opening of the Arena enabling some spectators to park in here on event days and access the Arena from within the masterplan. The removal of through access (for cars) from the southern end of Schooner Way will also protect the residential areas from traffic coming to the area; in particular from those travelling to visit the Arena. The Proposed Development will not impact directly on the provision of public transport. However, it will support the business case for future investment and expansion of the public transport network that serves the Cardiff Bay area and therefore this may have an indirect effect on accessibility.

15.5.39 Overall, it is considered that the Proposed Development will significantly improve accessibility and active travel options for the local and wider areas of Cardiff and is considered to be of medium magnitude. Further, the likely indirect effect on the provision of public transport services is considered to improve accessibility both into

and from the study area and is considered to be of medium magnitude. The population sensitivity is assessed as medium based on:

- Medium population exposure
- Medium population vulnerability due to the variable levels of accessibility across the population

15.5.40 Therefore, overall, there is likely to be a **moderate beneficial** indirect and direct health effect on the local population, which is **significant**.

Crime reduction and community safety

15.5.41 Evidence shows that community safety is crucial in determining direct and indirect health and wellbeing outcomes (refer to Appendix 15.2 for evidence). For example, reducing the fear of crime can have positive effects on mental health and wellbeing and encourages greater use of the public realm and open spaces by more vulnerable groups such as women, older people and people with disabilities.

Construction

15.5.42 A Construction Environmental Management Plan (CEMP) will be implemented to manage impacts on crime reduction and community safety during construction. It will include details of public access during construction and managing safety during times when only part of the Site is occupied. A CEMP for the enabling works, prior to the construction of the Arena and Hotel will be submitted with the application. This will include implementation of measures such as CCTV cameras, security personnel, enhanced lighting, and hoarding. Other CEMPs are anticipated beyond the enabling works as the project progresses which will include details of how the Site will be secured during construction to prevent unauthorised access and potential theft or criminal damage.

15.5.43 Overall, due to the mitigation measures in place to prevent crime and maintain community safety, it is unlikely that there will be any health and wellbeing effects during construction.

Operation

15.5.44 During operation, the Proposed Development could attract anti-social behaviour due to the presence of the Arena which will have a capacity of 15,000 people and an estimated 140 events a year. The effect on crime will depend on the nature of the

events hosted (i.e. sporting, music etc.) and the timing of events (i.e. daytime, night-time). This could affect levels of safety and perceptions of safety for local residents.

15.5.45 The baseline profile revealed that Cardiff is the most dangerous city in South Glamorgan and the most common crimes include antisocial behaviour, violence, and sexual offences. At a local level, the study area is highly deprived for community safety, with the exception of Cardiff 048B and Cardiff 048C LSOAs which are not considered deprived.

15.5.46 Taking this into account, the Proposed Development has been designed to ensure safe and accessibility routes during daytime and evening use and will be served with appropriate infrastructure to accommodate the diversity of land uses proposed within the wider masterplan. This includes the presence of security during events, including CCTV coverage, external barriers to prevent ramming or close proximity (parked or encroachment attack) and bins are also discouraged within crowded areas surrounding the Arena. Landscaping has been designed in collaboration with the Counter Terrorism Security Advisor to ensure that threats related to terrorist attacks can be mitigated. Mix of native trees and native understory planting and anti-terrorism street furniture will also be provided to secure the areas of the Proposed Development. The landscaping proposals have also been designed to balance the security requirements for the Arena by reducing opportunities for hiding/entrapment spaces, obscure signage, lighting, or CCTV, or provide a potential climbing aid into properties.

15.5.47 Overall, due to the mitigation measures in place to prevent crime and maintain community safety, it is unlikely that there will be any health and wellbeing effect during operation.

Access to healthy food

15.5.48 Evidence shows that the availability of healthy eating food outlets which sell high quality, nutritious food at affordable prices is an important factor influencing food choices. Access to healthy food and a nutritious diet can prevent health effects and chronic diseases related to obesity. Poor diet and nutrition, together with smoking and alcohol contribute to coronary heart disease and cancer deaths (refer to Appendix 15.2 for evidence).

Construction

15.5.49 There will be no direct impact on food retail or loss of access to local shopping areas.

Further, the Site is located in central Cardiff with easy access to food around the Site including a Tesco Express and Sainsburys Local in Cardiff Bay which is considered to absorb the extra demand due to the increased presence of construction workers. Therefore, this determinant is not considered to give rise to health effects during construction.

Operation

15.5.50 The proposal will provide up to 12,550sqm of GIA for retail, food and beverage use which is likely to impact access to healthy food however, detailed information on the types of uses and provision of healthy food options are unknown at the moment and therefore, the impact on determinant and health effect is unknown.

Access to work and training

15.5.51 Evidence shows that there is a strong positive correlation between good employment, income levels, and social and psychological wellbeing. Employment and training accrue a range of health benefits, improving life expectancy, and enabling healthier lifestyle choices (refer to Appendix 15.2 for evidence).

Construction

15.5.52 The construction of the Proposed Development is anticipated to generate 1,200 construction jobs. These employment opportunities may provide a range of employment for local and wider area residents however, they will be temporary.

15.5.53 The baseline profile indicates mainly low levels of deprivation in terms of employment and income in the local area however, pockets of high deprivation are observed, particularly in Cardiff 049A and Cardiff 049B. Further, variable levels of education deprivation are also observed across the study area. For example, Cardiff 038A is 10-20% most deprived while Cardiff 048C is 50% least deprived. This suggests that the skill profile of the residents in the local area will broadly match the skill profile of the temporary employment opportunities generated by the Proposed Development.

15.5.54 The Socio-economic Assessment (Chapter 14) also identified higher levels of unemployment in the ward (Butetown – 7.3%) than in Cardiff (3.8%) and Wales (3.7%) based on 2020 data and data from the 2011 Census. This suggests that employment opportunities arising from the Proposed Development will be attractive to

unemployed individuals within the wider area and may contribute to increased economic activity during construction.

15.5.55 The Proposed Development is also likely to support a wider supply chain and service industries in the local vicinity of the Proposed Development, including food outlets and convenience stores. Any new employment or increase in profit generated by the construction works is likely to bring positive effects to the local economy and be beneficial to the wellbeing of the local communities within these supply chain and service industries.

15.5.56 This could benefit the populations health and wellbeing due to the health benefits associated with increased income and employment. Considered across the local and wider study area, the magnitude of the health effect is evaluated as low. The population sensitivity is assessed as high based on:

- High population exposure: due to high number of jobs
- Medium population vulnerability: due to presence of some areas of education, employment and income deprivation locally

15.5.57 This is likely to result in a **moderate beneficial** health effect on the local population, which is **significant**.

Operation

15.5.58 The operation of the Proposed Development is anticipated to generate approximately 1,373 full time equivalent jobs within the Arena, Hotel and wider masterplan elements (see Chapter 14 Socio-economic Assessment). Due to the nature of the Proposed Development and activities held, it is assumed that the job opportunities will range from high – skilled to low skilled. The baseline profile indicates low levels of deprivation in terms of employment and income in the local area with pockets of high deprivation, particularly in Cardiff 049A and Cardiff 049B. Further, the baseline profile domain indicates low to high levels of education deprivation across the local study area. This suggests that the skill profile of the residents in the local area will broadly match the skill profile of the employment opportunities generated by the Proposed Development.

15.5.59 The Socio-economic Assessment (Chapter 14) also identified higher levels of unemployment in the ward (Butetown – 7.3%) than in Cardiff (3.8%) and Wales (3.7%) based on 2020 data and data from the 2011 Census. This suggests that employment

opportunities arising from the Proposed Development will be attractive to unemployed individuals within the wider area and may contribute to increased economic activity.

15.5.60 This could benefit the populations health and wellbeing due to the health benefits associated with increased income and employment. Considered across the local and wider area, the magnitude of the health effect is evaluated as medium. The population sensitivity is assessed as high based on:

- High population exposure: due to high number of jobs and range of different job types
- Medium population vulnerability: due to presence of some areas of education, employment and income deprivation locally

15.5.61 This is likely to result in a **major beneficial** health effect on the local population, which is **significant**.

Social cohesion and inclusive design

15.5.62 Social cohesion is defined as the quality of social relationships and existence of trust, mutual obligations and respect in communities or wider society, and is linked to levels of inequality or exclusion within a given community. Evidence shows that the physical environment can directly influence social cohesion (refer to Appendix 15.2 for evidence).

Construction

15.5.63 The new Red Dragon Centre will be constructed before the demolition of the existing Red Dragon Centre is started; therefore, it is assumed that there will be continuity of community events during this period. As a result, this determinant is not considered to give rise to health effects during construction.

Operation

15.5.64 The overall masterplan includes a mix of residential, commercial, retail, food, beverage, and culture space which will all enable social connection and enhance cohesive communities.

15.5.65 The Arena will be publicly accessible and will host a wide range of entertainment-based content including music, comedy, family shows and occasional international sporting events. These will be accessible and will improve engagement and

socialisation between and within members of the local and wider area. This will encourage community cohesion benefiting health and wellbeing of these communities.

15.5.66 Overall, these measures will impact social cohesion and inclusive design and affect the health and wellbeing of the local and wider community. The magnitude of the impact has been evaluated as low. The population sensitivity is assessed as medium based on:

- Medium population exposure
- Medium population vulnerability due to the presence of ethnically diverse groups and religious groups within the area

15.5.67 Overall, there is likely to be a **minor beneficial** health effect on the local population, which is **not significant**.

Climate change

Construction

15.5.68 The Proposed Development will result in the emission of GHGs which is a long-term effect contributing to global warming and climate change however, if mitigation measures are implemented in the form of energy efficient building standards and renewable energy sources, then the magnitude of the effect is minimised. Whilst this will be a significant effect from a climate change perspective, this change in emissions will not be perceptible by residents and therefore, there will be no effects from a health and wellbeing perspective.

Operation

15.5.69 There are a variety of sustainability and energy objectives associated with the creation of a new multi-use development. For example, the Proposed Development will utilise renewable energy production to reduce carbon emissions and energy demand. There is also a commitment to potentially connect to the heat network while implementing recycling and waste reduction strategies for operational use. These measures will contribute to the sustainability of the Proposed Development and positively impact climate change.

15.5.70 The Proposed Development will contribute to a modal shift by placing a greater emphasis on walking, cycling and public transport and thereby improving climate

change. It also includes sustainable drainage systems (SuDS) to mitigate surface drainage and remain climate resilient.

15.5.71 Overall, the Proposed Development is considered to perform well in terms of climate change and sustainability. The change in emissions is unlikely to be perceptible to the local population and therefore, the population sensitivity is evaluated as low due to low exposure and low vulnerabilities. Therefore, no health effects are anticipated within the study area of the Proposed Development.

15.6 Mitigation

15.6.1 The health assessment takes into account mitigation measures incorporated by Traffic and Transport (Chapter 7), Air Quality (Chapter 11), Noise and Vibration (Chapter 12), Socio-economics (Chapter 14), Townscape and Visual Amenity (Chapter 16), and Climate Change (Chapter 17) to reduce the adverse effects of the Proposed Development on people and the environment.

15.7 Residual Effects

The residual effects predicted as part of the assessment are consistent with those reported above and summarised in Table 15.5.

Table 15-5 Assessment Summary Matrix of Effects

Potential Effect	Receptor(s)	Sensitivity of Receptor	Magnitude (prior to mitigation)	Significance (prior to mitigation)	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments
Construction								
Deterioration of neighbourhood amenity due to the presence of a construction site	Local residents	Medium	Medium	Significant (moderate adverse)	Hoarding and general good practice housekeeping measures set out in the CMLP	Low	Not significant (minor adverse)	None
Loss of access to open space and nature	Local and wider residents	High	Low	Significant (moderate adverse)	None	Low	Significant (moderate adverse)	A significant moderate adverse effect is anticipated due to the loss of the southern part of Silurian Park during construction of the Proposed Development which is considered to worsen access to open space and nature.
Increased access to employment opportunities during construction	Job seekers, particularly those in the construction industry	High	Low	N/A	N/A	N/A	Significant (moderate beneficial)	A significant moderate beneficial effect is anticipated due a medium number of jobs

								directly generated by the construction of the Proposed Development which will improve income and employment provision.
Operation								
Loss of neighbourhood amenity due to greater density and larger heights of the Proposed Development buildings	Local residents	Medium	Low	Not significant (minor adverse)	N/A	Low	Not significant (minor adverse)	None
Improved housing quality and design due to provision of affordable and market rate housing	Local and wider residents	High	Low	N/A	N/A	N/A	Significant (moderate beneficial)	A significant moderate beneficial effect is anticipated due to the provision of housing in the area. This is considered to improve the quality and design of housing in the local and wider study area.
Improved access to social infrastructure due to the provision of	Local and wider residents	High	Low	N/A	N/A	N/A	Significant (moderate beneficial)	A significant moderate beneficial effect is anticipated due to the provision of social

leisure, retail, food and beverage areas								infrastructure in the area. This is considered to increase access to basic needs and leisure facilities in the study area.
Improved access to open space and nature	Local and wider residents	High	Medium	N/A	N/A	N/A	Significant (major beneficial)	A significant major beneficial effect is anticipated due to the provision of open space and public realm which is considered to increase access to open space and nature.
Improved accessibility and active travel due to the provision of public realm conducive to pedestrians and cyclists and indirect provision of public transport services	Local and wider residents	Medium	Medium	N/A	N/A	N/A	Significant (moderate beneficial)	A significant moderate beneficial effect is anticipated due to direct generation of environment conducive to pedestrians and cyclists and indirect effect on the provision of public transport services. This is considered to improve accessibility

								and active travel both into and from the study area.
Improved social cohesion due to generation of opportunities for socialisation and community events	Local residents	Medium	Low	Not significant (minor beneficial)	N/A	N/A	Not significant (minor beneficial)	None
Increased access to employment opportunities	Job seekers, local and wider residents	Medium	High	Significant (major beneficial)	N/A	N/A	Significant (major beneficial)	A significant major beneficial effect is anticipated due to high number of jobs directly generated by the operation of the Proposed Development. This will result in health benefits associated with improved income and employment provision.

15.8 Assessment of Cumulative Effects

- 15.8.1 Committed developments in the study area plus any outside this area that are picked up by relevant topics in the ES, including Traffic and Transport (Chapter 7), Air Quality (Chapter 11), Noise and Vibration (Chapter 12), Socio-economics (Chapter 14), Townscape and Visual Amenity (Chapter 16) and Climate Change (Chapter 17) were considered for the cumulative effects relating to the Proposed Development.
- 15.8.1 No cumulative health effects were identified based on the review of cumulative impacts reported by other chapters relating to health. There is a potential for cumulative impact of construction of committed developments on access to social infrastructure however, more detail is needed to fully assess this impact which is not available at this stage (see Chapter 14 of the ES (Socio-economic assessment) for more detail).

Conclusion

Construction

- 15.8.2 During construction, the loss of the southern part of Silurian Park is considered to decrease access to open space and nature which is considered to arise in a moderate adverse significant health effect. The provision of construction jobs will contribute to increased income and employment and will result in a moderate beneficial significant health effect.

Operation

- 15.8.3 During operation, the provision of housing is considered to improve the quality and design of housing in the study area and result in a moderate beneficial significant health effect. The provision of new leisure, retail, food, and beverage spaces will improve access to social infrastructure and result in a moderate beneficial significant health effect. The provision of a range of new open spaces and public realm will improve access to open space and nature and result in a major beneficial significant health effect. The creation of jobs will contribute to increased income and employment and will result in a major beneficial significant health effect.