

5 POPULATION AND HUMAN HEALTH

5.1 Introduction

This chapter examines the potential impact of the construction and operation of the proposed residential development on those residing and working in the vicinity of the subject site.

Issues associated with human beings are varied and cover a broad spectrum of topics associated with the existence, activities and wellbeing of people as groups or 'populations'. Whilst most developments will affect people in some way or form, this chapter focuses on those topics that are manifested in the environment, such as demographic change, impacts on community facilities, and on the economy. In respect of Human Health, this chapter ultimately draws from potential health issues and environmental hazards arising from a number of elements of the environment. These impacts are dealt with throughout the EIAR, and in particular, the following chapters:

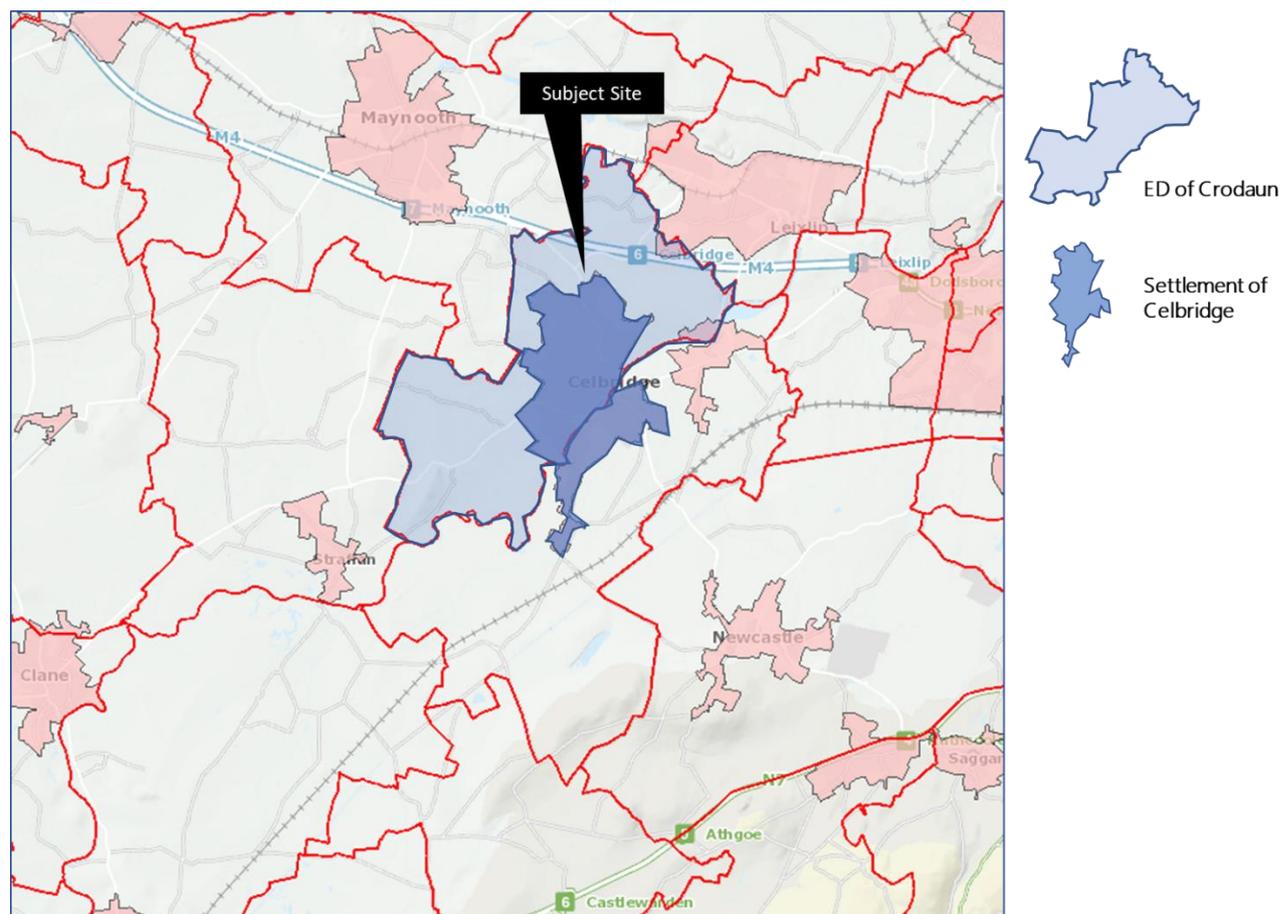
- Chapter. 7 Land, Soil and Geology
- Chapter. 8 Water: Hydrology and Hydrogeology
- Chapter. 9 Air, Dust and Climatic Factors
- Chapter. 10 Noise and Vibration
- Chapter. 11 Material Assets: Traffic & Transport
- Chapter. 12 Material Assets: Water Supply, Drainage and Utilities
- Chapter. 14 Landscape & Visual Assessment

This chapter initially sets out the appraisal methods used in the assessment process (Section 5.2) and then proceeds to describe the existing environment (Section 5.3), the characteristics of the proposed development (Section 5.4); assesses the predicted impacts of the proposed subject development on population (Section 5.5); assesses the predicted impacts of the proposed subject development on human health (Section 5.6); outline mitigation measures to be incorporated into the proposed development in order to reduce and/or eliminate any significant adverse impacts (Section 5.7); difficulties encountered in gathering the information for this section of the EIAR (Section 5.8); details any residual impacts arising from the proposed subject development (5.9); and lastly, impact interrelationships that will arise as a result of the proposed scheme are detailed (Section 5.10).

5.2 Appraisal Methodology

5.2.1 Study Area

Two study areas were chosen for the baseline assessment of the subject site at Crodaun - the first being the Settlement of Celbridge, as defined in the 2016 CSO Small Area Population Map (SAPMAP) and the Celbridge Electoral Division (Ref. 06034), as defined in the CSO Census of Population 2016. The extent of these study areas is mapped in Figure 5.1 below.

Figure 5.1 Map showing Celbridge ED and Celbridge Settlement Area

Source: CSO

5.2.2 Characteristics of the Population

An examination of the key demographic and socio-economic characteristics of the study areas was undertaken, which included an examination of age profile, population trends and employment status. Recent demographic trends at State, county and local level were also examined. The assessment involved desktop research and analysis of existing documentation to develop a comprehensive understanding of the communities that would be impacted by the proposed development. The main sources of information for this desktop review comprised:

- Central Statistics Office (CSO) Census of Population, including information published in respect of Census 2016;
- Ordnance Survey Ireland (OSI) aerial photography; and the
- Celbridge LAP, 2017-2023.

5.2.2.1 Communities

The principal types of communities identified within the study area were:

- Resident Community (residents living in the surrounding vicinity of the subject lands)
- Working Community (those to live and work in Celbridge and those who live elsewhere and travel to Celbridge for work)

- Visitor Community (those visiting the area for recreational purposes)

The level of community facilities and services was examined through desk-top survey work and on the ground reviews.

5.2.3 Human Health

The Institute of Public Health (IPH) in Ireland issued '*Health Impact Assessment Guidance*' in October 2009. This guidance document draws from international best practise and the recommendations of the World Health Organisation (WHO). Section 4.2 'HIA Process' of the IPH guidance provides an overview of the HIA process, which has six stages comprising;

- Screening
- Scoping
- Appraisal
- Recommendations
- Implementation of Recommendations
- Monitoring and Evaluation

The IPH guidance includes a screening tool. As recommended in the guidance, screening of the proposed scheme was informed by the quantitative assessments undertaken by competent professionals as part of this EIA process. In this way, the assessments undertaken in chapters all chapters 6, 7, 8, 9, 10, 11, and 12 of this EIAR have been utilised as part of the screening stage. The table below is a reiteration of 'Appendix 2: Screening Tool' of the IPH guidance. Section Two 'Potential Impacts on Health Determinants' gives instructions on how to complete the table.

Where a proposal is likely to have an impact on health the code used is L; where a proposal is unlikely to have an impact on health the code used is U; and, where there is insufficient information to assess the impact of a proposal, the code is NK. It is of note that the IPH screening methodology does not make any allowances for positive impacts on health arising from a proposal. Therefore, the screening methodology employed for the purposes of this EIA seeks to identify whether the proposal is likely to have negative impacts, is unlikely to have negative impacts, and to identify incidents where there is insufficient information.

Table 5.1 Content of 'Appendix 2: Screening Tool' of the 'Health Impact Assessment Guidance' 2009, Institute of Public Health (IPH) in Ireland

Section one: Background and context
Question
Title of proposal being screened
Date screening conducted
Person(s) involved in the screening process (name, organisation represented and job title if applicable)

What stage of development is the proposal at?		
Briefly outline the importance of the proposal from: An economic/ business perspective A political perspective A community perspective		
What resources are available to conduct a HIA? (Consider both human and financial)		
Are decision makers likely to be open to recommendations to amend the proposal?		
Section Two: Potential Impacts on Health Determinants		
Social and Economic Conditions that Influence Health	Structural Issues that Influence Health	Individual and Family Issues that Influence Health
Likelihood that the proposal will impact on this health determinant:	Likelihood that the proposal will impact on this health determinant:	Likelihood that the proposal will impact on this health determinant:
Housing	Housing	Diet
Public buildings	Public buildings	Physical Activity
Commercial buildings	Commercial buildings	Substance use (legal and illegal)
Green space (including parks)	Green space (including parks)	Sexual activity
Other public spaces	Other public spaces	Household income
Road safety and transport infrastructure	Road safety and transport infrastructure	Family cohesion
Communications infrastructure (internet/telephone)	Communications infrastructure (internet/telephone)	Other individual and family issues (list)
Energy sources	Energy sources	
Waste management infrastructure	Waste management infrastructure	
Water quality	Water quality	
Air quality (indoor and outdoor)	Air quality (indoor and outdoor)	

Soil quality	Soil quality	
Noise	Noise	
Light	Light	
Other structural issues (list)	Other structural issues (list)	

In each instance, list the groups likely to be affected by the proposal. Examples of difference population groups are listed below:

- | | |
|--|---|
| <ul style="list-style-type: none"> • Infants and toddlers • Children and young people • Working age people • Older people • Rural population • Urban population • Males/ females • Single/ married people • Gay/ lesbian people • People with dependants | <ul style="list-style-type: none"> • Racial and ethnic groups (particularly minority groups) • People with particular religious beliefs • People with particular political opinions • People with disabilities • Chronically ill people • Homeless people • Unemployed people • Economically disadvantaged people • Others |
|--|---|

Section Three: Screening Outcome

Question	Conclusion
Overall, health impacts are unlikely or relatively minor and easy to address.	Where appropriate, make recommendations to decision makers on how such impacts may be addressed. Do not proceed with HIA.
Overall, health impacts are likely or unknown.	Taking into account issues raised in section one, proceed with HIA.

If the overall health impacts are unlikely, relatively minor and easy to address then HIA is not required.

In addition to the screening process described above, a preliminary assessment of direct impacts on health that could potentially arise due to the construction and use of the proposed development has been evaluated using the simple Source-Pathway-Receptor model. This approach involves the identification of contaminant sources, environmental pathways and receptors, and the identification of any potential pollutant linkages.

5.2.4 Assessment Criteria

The assessment of the impacts of the proposed development on the population and human health has been carried out with regard to the guidance used for the other impacts, e.g. on environmental effects,

economy, accessibility and integration. Guidance on these themes is provided in the following documents Guidelines on Information to be contained in Environmental Impact Statements EPA (2002), Advice Notes on Current Practice in the Preparation of Environmental Impact Statements, EPA (2003) and the Draft 'Guidelines on The Information to be Contained In Environmental Impact Assessment Reports' EPA (2017).

Table 5.2 Summary of Table 3.3 of The EPA's 'Guidelines on the Information To Be Contained In Environmental Impact Assessment Reports' Draft From August 2017

Type	Description
<p>Describing the Probability of Effects</p> <p>Descriptions of effects should establish how likely it is that the predicted effects will occur – so that the CA can take a view of the balance of risk over advantage when making a decision.</p>	<ul style="list-style-type: none"> • Likely Effects: The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented. • Unlikely Effects: The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
<p>Quality of Effects</p> <p>It is important to inform the non-specialist reader whether an effect is positive, negative or neutral</p>	<ul style="list-style-type: none"> • Positive Effects: A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities). • Neutral Effects: No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error. • Negative/adverse Effects: A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
<p>Describing the Significance of Effects</p> <p>'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful</p>	<ul style="list-style-type: none"> • Imperceptible: An effect capable of measurement but without significant consequences. • Not significant: An effect which causes noticeable changes in the character of the environment but without significant consequences. • Slight Effects: An effect which causes noticeable changes in the character of the environment without affecting its sensitivities. • Moderate Effects: An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.

Type	Description
	<ul style="list-style-type: none"> • Significant Effects: An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment. • Very Significant: An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment. • Profound Effects: An effect which obliterates sensitive characteristics
<p>Describing the Duration and Frequency of Effects</p> <p>'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.</p>	<ul style="list-style-type: none"> • Momentary Effects: Effects lasting from seconds to minutes • Brief Effects: Effects lasting less than a day • Temporary Effects: Effects lasting less than a year • Short-term Effects: Effects lasting one to seven years. • Medium-term Effects: Effects lasting seven to fifteen years. • Long-term Effects: Effects lasting fifteen to sixty years. • Permanent Effects: Effects lasting over sixty years • Reversible Effects: Effects that can be undone, for example through remediation or restoration • Frequency of Effects: Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
<p>Describing the Types of Effects</p>	<ul style="list-style-type: none"> • Indirect Effects (a.k.a. Secondary Effects): Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway. • Cumulative Effects: The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects. • 'Do-Nothing Effects': The environment as it would be in the future should the subject project not be carried out. • 'Worst case' Effects: The effects arising from a project in the case where mitigation measures substantially fail.

Type	Description
	<ul style="list-style-type: none"> • Indeterminable Effects: When the full consequences of a change in the environment cannot be described. • Irreversible Effects: When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost. • Residual Effects: The degree of environmental change that will occur after the proposed mitigation measures have taken effect. • Synergistic Effects: Where the resultant effect is of greater significance than the sum of its constituents, (e.g. combination of SO_x and NO_x to produce smog).

5.3 Description of the Existing Environment

5.3.1 Site Description

The site comprises an irregular shaped plot of land that extends to approximately 9.55 ha. The site fronts the eastern side of the Maynooth Road (R405) and lies to the south of its junction with the R449 which continues onwards to connect at Junction 6 with the M4 motorway, a short distance to the north-east of the subject lands.

The site benefits from generous road frontage onto the R405 to the west and R449 to the north. The lands back onto open fields to the north-east and the rear gardens of houses within the established residential development of Crodaun Forest Park.

The subject site comprises of a number of large fields currently in use as grazing land and a small triangular field, falling gently from north to south. The intervening field boundaries comprise of mature hedgerows with a hard surfaced laneway in the south-western part off the R405.

At present, there are no dwellings within the subject site and therefore the area does not accommodate a resident population.

5.3.2 Socio-Economic Role of Celbridge

The Kildare County Development Plan recognises and acknowledge the supporting economic role of Celbridge to Primary Economic Growth Centres. To this end Policy Objective ECD 5 seeks to:

'(i) Promote and facilitate regional scale employment development as a priority in the Primary Economic Growth Centres of Maynooth and Leixlip/Collinstown supported by Celbridge and Kilcock in the Metropolitan area; and Naas/Newbridge in the Hinterland area supported by Kilcullen and the Secondary Economic Growth Towns of Athy and Kildare.

'(ii) Recognise the supporting role of economic clusters (Celbridge and Kilcock to Maynooth and Leixlip, and Kilcullen to Naas and Newbridge) in the delivery of critical mass to deliver employment opportunities on a regional scale.'

5.3.3 Population Trends

The Census Population Data 2016 identified that the population of the Celbridge ED increased from 15,323 to 15,653 persons between 2011 and 2016, resulting in a population growth of 2.15% over this period, which lags significantly behind the corresponding County Wide population growth of 5.80% and to a lesser extent that of Celbridge town at 3.84% over the same period.

Table 5.3 Population Change from 2011-2016

Area	2011	2016	Percentage change 2011-2016
State	4,588,252	4,761,865	3.78%
Kildare	210,312	222,504	5.80%
Celbridge ED	15,323	15,653	2.15%
Celbridge Town / Settlement	19,537	20,288	3.84%

Source: CSO (2016)

5.3.4 Age Profile

According to CSO data the average age of the population of the State in 2016 was 37.4, up from 36.1 in 2011, a rise of 1.3 years. The average age for Kildare County has increased to 34.9 from 33.5 years, as recorded in the 2011 census.

Table 5.4 Population of State and Celbridge Town by Age Category in 2016

Age Cohort (% of total Population)	State Population	% Population per Age Group	Celbridge Town - Population	% Population per Age Group
Persons aged 0-4 years	331,515	6.96 %	1,635	8.06%
Persons aged 5-12 years	548,693	11.5 %	2,762	13.61%
Persons aged 13-18 years	371,588	7.8 %	1,789	8.82%
Persons aged 19-24 years	331,208	6.96 %	1,375	6.78%
Persons aged 25-34 years	659,410	13.9 %	2,653	13.08%
Persons aged 35-44 years	746,881	15.7 %	3,722	18.35%
Persons aged 45-54 years	626,045	13.2 %	2,894	14.26%
Persons aged 55-64 years	508,958	10.7 %	2,145	10.57%
Persons aged 65-74 years	373,508	7.8 %	914	4.51%

Age Cohort (% of total Population)	State Population	% Population per Age Group	Celbridge Town - Population	% Population per Age Group
Persons aged 75 years and over	264,059	5.6 %	399	1.97%

Source: CSO 2016

The table above provides a breakdown of the population of the State and Celbridge Town by age group. In this regard it is note that the age profile of Celbridge suggests a younger resident population, comprising of young families, particularly in respect of:

- A larger proportion of children 0-18 years at 30.5% compared to 26.3% state-wide;
- A larger parental age cohort (35-44 years) than that of the state; and
- A significant lower proportion of older persons (age 65+) at 6.5% compared to that of the state at 13.4%.

5.3.5 Employment

The employment statistics provides an understanding of the economic profile of the subject area and its surrounding area. CSO data from 2016 states that in Celbridge town there were 15,231 persons aged over 15, of which 9,415 persons (or 61.8% of the working population) were 'at work'⁵.

A total of 1,948 persons, or 12.8% were students or pupils and 1,100 persons (or 7.2%) are looking after home/family. The unemployment rate in 2016 in Celbridge was approximately 5.3% (i.e. persons either seeking their first job or having lost/left their previous jobs). In comparison, at the national level 7.9% of persons over 15 years of aged were unemployed in 2016.

5.3.6 Economic Activity

The 2016 census identified that the most common occupations of those living in Celbridge Town were 'Professional Occupations' (21.2%), followed by 'Associate Professional / Technical Occupations' (14.7% and 'Administrative Occupations' (13%).

In this regard it is noted that the Celbridge LAP, 2017-2023 states that:

'Celbridge has relatively high numbers of people employed in managerial, technical, professional and non-manual services when compared to both the county and the State, which is reflective of the overall socio-economic profile of North Kildare....relatively high participation in the "knowledge economy" workers tend to be drawn to the major employment clusters in Leixlip, Dublin and elsewhere in the region.

Commuting data from Census 2011 confirms that Celbridge is a commuter town serving Dublin and the wider region. The census indicates that 12% of the working population were employed in Celbridge, 60% worked outside of Celbridge and 15% worked elsewhere in Kildare.'

⁵ 'At Work' comprising both 'Employees' and 'Employer or Own Account Workers'.

5.3.7 Housing

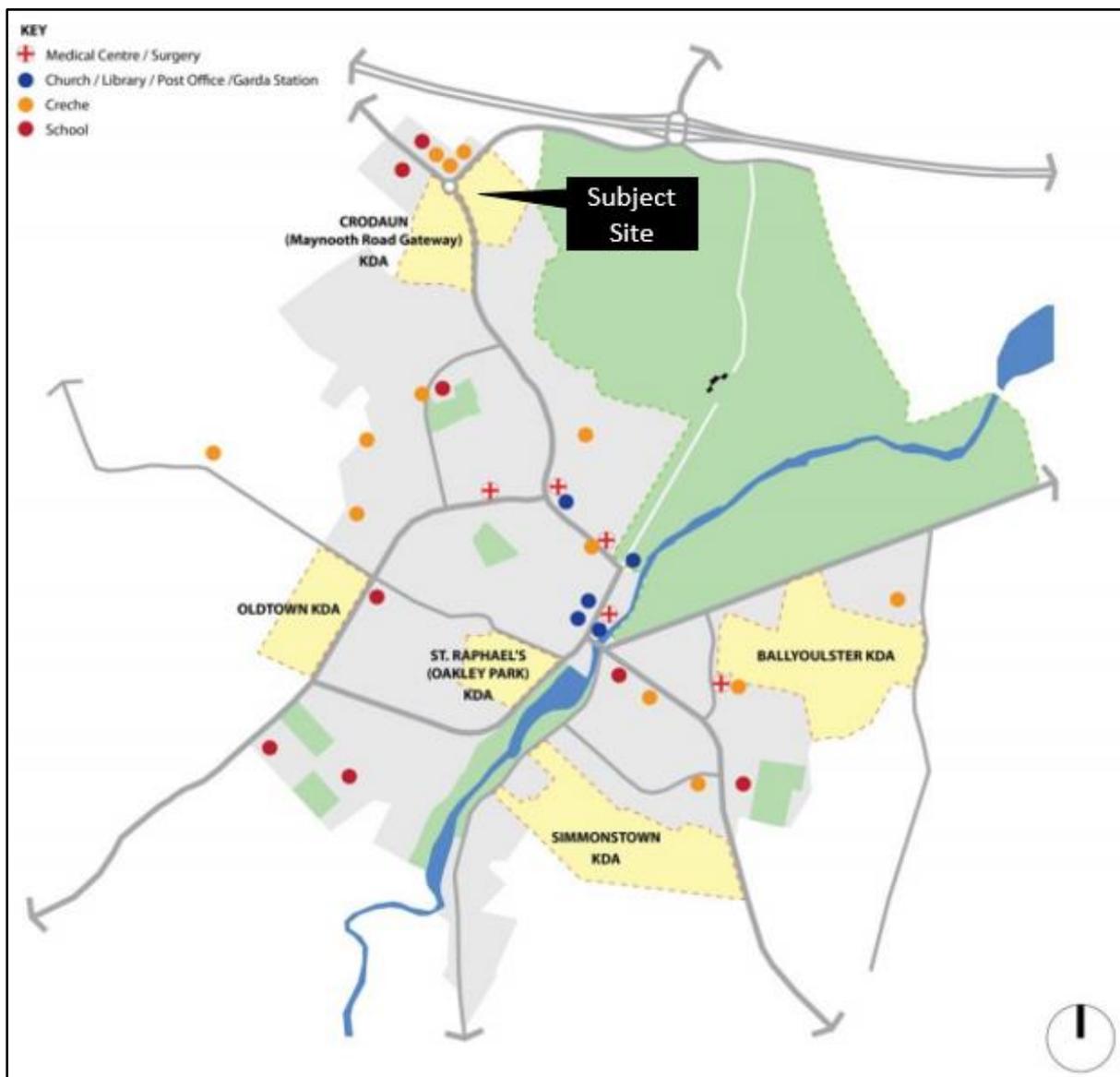
Residential development in the vicinity of subject lands comprises mainly of low-density forms of housing of a traditional two-storey domestic scale in the adjoining neighbourhood to the south that is known as Crodaun Forest Park.

Currently a scheme of 495 no. dwellings (228 no. houses, 42 no. duplexes, 225 no. apartments) with a childcare facility and associated site works is being pursued by Crodaun Development Company on the western side of the R405 (directly opposite the subject site). This proposal is pursued under ABP Ref. PL09. 304246 as a Strategic Housing Development.

5.3.8 Community Facilities and Amenities

According to the Celbridge LAP, 2017-2023 the town is well served by community facilities, amenities, services and active community groups. Figure 5.2 shows the location of community facilities in Celbridge.

Figure 5.2 Community Facilities Distribution in Celbridge



Source: Fig 6.4, Celbridge LAP, 2017-2023

Set out below is summary of the various community facilities by

- Education: 3 no. Second Level Schools and 8 no. Primary Schools;
- Childcare: 13 no. full day care facilities, sessional, after-school, Montessori, Pre-School (Crèche) and Day Care facilities;
- Playgrounds: 2 no. (Celbridge Abbey and Willowbrook) Parks Castletown Demesne
- Healthcare: 5 no. Medical Centres (Private) and North Kildare Doctors on Call;
- Religious Facility: Christ Church St Patrick's Church Celbridge Christian Church Garda Station Maynooth Road;
- Library with exhibition spaces;
- Sport facilities: Celbridge GAA, Ballyoulster AFC, Celbridge Town AFC, Celbridge Tennis Clubs, Elm Hall Golf Club, MU Barnhall Rugby Club.
- Other Community Facilities and Organisations: Derrybeg Community Supported Farm; The Mill Community Centre; Slip Hall and 'The ACRE'.

5.3.9 Human Health

The subject site does not contain any dwellings and therefore does not accommodate a resident population. The subject site is in private ownership and is not open to the public and is therefore not used as a public amenity resource.

5.4 Characteristics of the Proposed Development

5.4.1 Characteristics of the Construction Phase

The main characteristics of the construction process and the nature and quantity of materials to be used is summarised below.

The construction phase will involve the clearance of topsoil and sub-soil together with treeline and hedgerow boundary features. Any inert construction and demolition waste will be removed by a licenced contractor and disposed of in accordance with the Waste Management Act. Other construction activities will include the following:

- Erection of structures and buildings;
- Construction of roads and site works,
- Construction of buildings and houses and fit out of same; and
- Landscaping works.

Materials that will be required during the construction phase will include:

- Construction materials;
- Elevational finishes and materials;
- Internal fit outs and finishes;
- Paving /surfacing;

- Piped Infrastructure;
- Telecommunications connections;
- Landscaping and street furniture; and
- Surface for car access.

There are no point air emissions from the site while some dust and noise can be expected during the construction phase.

A bill of quantities for the proposed development has not been prepared to date and as such it is not possible at this time to estimate the quantity of material required.

5.4.2 Main Characteristics of the Operational Phase

The impacts of the operational phase of the proposed development are addressed as appropriate in the relevant chapters of the EIAR, which includes an estimation of the type and quantity of residues and emissions arising during the operational phase of the proposed development.

Potable water will be supplied from a mains supply which originates from reservoirs at Ballymore Eustace, along the River Liffey.

Wastewater from the development will pass to the Osberstown wastewater treatment plant (also known as the Upper Liffey Valley Regional Sewerage Scheme). This plant discharges treated wastewater to the River Liffey under licence from the Environmental Protection Agency (EPA).

Surface water will be attenuated on site through the use of underground storage tanks and an oil/grit interceptor. This will discharge to an existing surface water sewer via attenuation storage tanks and a flow control device and will ultimately discharge to the River Liffey. The use of permeable paving will reduce the volumes of rainwater entering the system. In this way surface water run-off will be maintained at a 'greenfield' rate.

The site is not located within or directly adjacent to any Natura 2000 area (SAC or SPA). This part of Kildare is characterised by urban land uses, being close to the town of Celbridge, although there are also areas of agricultural and other open space. The site itself lies directly adjacent to a residential estate (to the south) and public roads (to the west and north). Mapping from the OSI and EPA show no significance water courses on the site. The Ballygoran Stream flows approximately 230m south of the site boundary at their closest points, and this flows into the River Liffey a short distance downstream. The River Liffey is subject to a number of Natura designations at Dublin Bay, where it discharges to the Irish Sea.

An Appropriate Assessment Screening Report has been prepared and is submitted under separate cover with this application. Chapter 4 of this EIAR assesses the impact of the proposed development on flora and fauna in accordance with the requirements of the EIA Directive as transposed into the Planning and Development Acts and Regulations.

The operational phase will see the development occupied and this will bring human disturbance, as well as noise and artificial light.

5.5 Predicted Impacts on Population of Celbridge

This section assesses the impacts of the proposed development on the surrounding environment from a Human Beings perspective and determines the predicted and potential impacts of the proposed development and whether the impacts will have an adverse impact on the local community. Where adverse impacts are identified, this EIAR proposes mitigation measures that will minimise and/or eliminate the impact of the development on the surrounding local community and local residents.

Impacts can be expected during both the construction and operational phases of the proposed development and these impacts may also be temporary, permanent, direct, indirect and cumulative.

Actual and perceived impacts of the proposed development on human beings may arise from a number of elements of the proposal. These impacts from Landscape and Visual, Roads and Traffic, Air Quality and Climate, Noise and Vibration and Material Assets are addressed in the appropriate chapters. The impacts identified below are in addition to those impacts described elsewhere within the EIAR.

5.5.1 Impact Interactions and Cumulative Impacts

Cumulative impacts are identified in the European Commission guidance as impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions, together with the proposed development. In respect of impacts arising from lands in the vicinity of the site, this section only considers developments that have been granted planning permission or are in the process of gaining approval.

5.5.2 Population

5.5.2.1 Construction Phase

Due to the construction works, there will be an increase in the number of persons working in the study area on a daily basis. Some construction workers may move into the area to be closer to their place of work. As a predominantly commuter town, the influx of workers during the day will have a positive impact on the population of Celbridge. The impact of the construction phase of this proposal on the population of Celbridge is considered to be direct positive, moderate and medium term.

5.5.2.2 Operational Phase

The construction of 372 no units will provide critical housing infrastructure for Celbridge, the wider hinterland and the Greater Dublin Area. The additional population for Celbridge will contribute positively to the community by reinforcing and strengthening the services and function of the town and by increasing housing supply in line with national housing policy. The proposed development will have a significant positive long-term impact.

5.5.2.3 Cumulative Impact

Future residential development at the subject site, in combination with recent residential applications/proposals in the vicinity and pipeline development (such as the remaining Key Development Area) to the south-west of the subject site on the opposite side of the Maynooth Road), will increase the population of the Town in an orderly / planned fashion in accordance with the Development Plan and the CLAP and would therefore have a direct, significant, positive and permanent impact of the population of Celbridge.

5.5.3 Communities and Facilities

5.5.3.1 Construction Phase

Construction traffic arising from this proposal will utilise the existing road network and will therefore impact upon those members of the community using these roadways. A Temporary Slight Negative Impact is likely to arise due to construction traffic during the construction phase.

5.5.3.2 Operational Phase

The proposed residential development will contribute additional population to the Celbridge community. This will contribute to the consolidation of the urban area and will assist in creating a more active, vibrant town with an increased critical population mass to support a wide range of facilities and services.

The proposed development will have a significant positive long-term impact on the community and resident population of Celbridge.

5.5.3.3 Cumulative Impact

It is envisaged that the future population in combination with the population increases as provided for under the LAP will enliven the town through engagement in local clubs and associations and supporting local shops, services and facilities. The proposed childcare facility will increase the availability of services to the existing community, particularly at this north-western urban fringe location. In combination with recent residential applications/proposals in the vicinity, the proposed development and other pipeline development associated with the development of the Key Development Area to the south of the Maynooth Road it would have a significant positive long term impact on the community and facilities of Celbridge.

5.5.4 Employment and Economic Activity

5.5.4.1 Construction Phase

The project will result in the provision of direct employment (full and part-time employment) within the construction and related sectors over the course of the construction phase. This is likely to bring benefits to the local economy in the form of increased spending and trade that will benefit local businesses and service providers in the town. Such increased spending and participation will have direct and indirect impacts on employment, income and the local economy in general. The construction phase of the development will therefore have a medium term moderate positive impact on the local economy.

5.5.4.2 Operational Phase

Local retail and businesses are likely to see a positive impact in the long term. The additional housing will likely lead to increased expenditure by new residents in the local community. This will have a long term moderate positive impact.

The availability of high-quality housing is important in terms of attracting and retaining domestic and international businesses and commercial entities within the wider catchment area. The proposed development will provide a range of suitable housing for the employees of new or expanding businesses. This will have a long term moderate positive impact on the economic functioning of the wider area and will contribute positively to the economic self-sufficiency ratio of Celbridge and its supporting economic role to Primary Economic Growth Centres within the County.

5.5.4.3 Cumulative Impact

In addition, the future population of the proposed development, the development of nearby strategic development sites with the potential to deliver a strategic housing quanta will contribute towards the delivery of a sustainable and critical population mass that will provide an increased customer base for existing businesses and service providers in Celbridge. In this way, it is considered that the cumulative impact of future development on employment and economic activity in Celbridge will be a long term moderate positive impact.

5.6 Predicted Impacts on Human Health

5.6.1 Air Quality

This section has been informed by Chapter 9 'Air, Dust and Climatic Factors' prepared by TMS Environment Ltd.

5.6.1.1 Construction Phase

In the assessment of the impacts of the construction phase of the proposed development on Air, Dust and Climatic Factors, it is stated in Chapter 9 of this EIAR that the mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health.

The assessment undertaken by TMS Environment Ltd. concluded that the predicted impact on air quality is temporary and ranges from imperceptible to slight, hence the potential human health impact during construction is short-term and imperceptible.

5.6.1.2 Operational Phase

Chapter 9 of this EIAR identifies that there will be no quantifiable impact on air quality due to emissions or traffic movements during the Operational Phase and the impact has been assessed as imperceptible. Therefore, the potential human health impact during Operation is **imperceptible**.

5.6.2 Noise and Vibration

This section has been informed by Chapter 10 'Noise and Vibration' prepared by TMS Environment Ltd.

5.6.2.1 Construction Phase

During the construction phase of the proposed development there will be some noise impacts experienced at the nearest receptors to the subject site. It is predicted that the mitigation measures proposed will ensure that noise and vibration impacts are kept to a minimum. The predicted noise and vibration impacts on the receiving environment during the construction phase are considered to range from imperceptible to moderate and will be temporary, only affecting a small number of properties over a short time-period. Accordingly, it is considered that the impact of the construction phase of the proposal Human Health will be imperceptible.

5.6.2.2 Operational Phase

The potential for noise generation during the operational phase of the proposed development is limited to additional vehicles on the surrounding road network. The change in noise levels associated with

vehicles is predicted as neutral, long term and not significant. The predicted noise and vibration impacts on the receiving environment during the operational phase are considered to be imperceptible.

5.6.3 Water: Hydrology and Hydrogeology

This section has been informed by Chapter 8 'Water: Hydrology and Hydrogeology' prepared by DBFL Consulting Engineers.

5.6.3.1 Construction Phase

Chapter 8 identifies that the main risk to human health can occur during the construction phase through potential cross contamination of potable water supply to the construction compound. However, it is identified that the implementation of the identified mitigation measures in Chapter 8 would reduce the likelihood of such events occurring and such risks would be localised and insignificant in nature.

5.6.3.2 Operational Phase

No likely significant impacts to human health were identified during the operational phase in terms of water (hydrology & hydrogeology). As such, the predicted impact on human health is considered to be long term, imperceptible with a neutral impact on quality.

5.6.3.3 Cumulative Impact

With regard to cumulative impacts, it is stated in Chapter 8 that this, and other future developments at the site and in surrounding areas, will be designed in accordance with best practice and relevant guidelines. Therefore, no cumulative impacts are anticipated in respect of risks from surface waters or flooding.

5.6.4 Land, Soil and Geology

This section has been informed by Chapter 7 'Land, Soil and Geology' prepared by DBFL Consulting Engineers.

5.6.4.1 Construction phase

Chapter 7 identifies that the main risk to human health can occur during the construction phase dust generation that is most likely to occur during extended dry weather periods as a result of earthworks and construction traffic. However, it is stated that provided the identified mitigation measures have been implemented, the likelihood of such events occurring would be local and not significant.

5.6.4.2 Operational Phase

There are no likely significant impacts to human health during the operational phase in terms of land, soils and geology due to the mitigation measures proposed. As such, the impact is considered to be long term, imperceptible with a neutral impact on quality.

5.6.4.3 Cumulative Impact

With regard to cumulative impacts, it is stated in Chapter 7 that with the implementation of mitigation measures proposed, the potential for cumulative effects on the local land, soils and geology environment with any adjacent developments is determined to be insignificant provided that similar mitigation measures are implemented for such other developments, should the construction phase of any other developments coincide with development of the subject site.

It is noted that in respect of land-take, the existing agricultural lands will be removed from agricultural use and will become urban in character. However, there is similar agricultural land availability within the local region and the area is zoned for residential development. Re-development will also provide public parklands which is an amenity land use not currently available to local residents in the area.

5.6.5 Unplanned Events

Unplanned events which may impact on human health during the construction and operational phase of the proposed development. This section has been informed by Chapters 7, 8, 9, 10, 11 and 12 of this EIA.

It is stated in Chapter 7 that the following accidents and disasters involving soils during construction could potentially give rise to a serious incident putting people at risk:

- Collapse of trench during excavation works
- Accidental spills and leaks may result in contamination of the soils underlying the site.

However, it is identified that with the implementation of the identified mitigation measures (as set out in Chapter 7), the likelihood of such events occurring would be local and not significant. On completion of the construction phase, there will be no further unplanned events anticipated on soils and the geological environment.

The following unplanned events involving hydrology (Chapter 8) could potentially give rise to a serious incident(s) putting people at risk:

- Accidental spills and leaks may result in contamination of water; and
- Flooding due to extreme event or unsuitable drainage measures.

However, it is identified that with the implementation of the identified mitigation measures (as set out in Chapter 8), the likelihood of such events occurring would be local and not significant.

It is stated in Chapter 9 that there is no real, or meaningful potential for unplanned events to cause a significant adverse impact on the air climate in the area that could otherwise affect human health.

Best practise control measures for noise and vibration will be put in place to protect construction workers and nearby sensitive locations. Anticipated methods of construction will not give rise to significant vibration emissions, while worst case scenario noise emissions, where all machinery is operating simultaneously, are considered moderate. No unplanned levels of noise or vibration are envisaged during the operational phase.

It is identified in Chapter 11 that the risk of accidents associated with the proposed development would not cause unusual, significant or adverse effects to the access of the existing public road network. The vast majority of the works are away from the public road. Measures will be put in place to assess the risk of road traffic accidents during the construction phase. It is expected that the risk of accidents would be low during the construction of the proposed development. Considering standard construction practises would be implemented used and no unusual substances or technologies would be used nor predicted. During the operational phase, it is anticipated that the risk of accidents and the resulting pollution risks will be reduced due to improved road safety conditions.

It is stated in Chapter 12 that the following accidents and disasters involving built services during construction could potentially give rise to a serious incident putting people at risk:

- Excavation works coming into contact with live electricity lines
- Excavation works causing damage and leaks to gas mains
- Collapse of trench during excavation works
- Accidental spills and leaks may result in contamination of water
- Flooding due to unsuitable drainage measures

With the implementation of the mitigation measures proposed in Chapter 12, the likelihood of such events occurring would be local and not significant.

The following accidents & disasters involving built services during operation could potentially give rise to a serious incident putting end users at risk:

- Gas explosions. The installation of services is tightly monitored and controlled by Gas Networks Ireland. Therefore, the residual risk is not considered significant.

The proposed infrastructure is designed in accordance with the relevant regulations, codes of practice and guidelines to provide sufficient capacity for the expected loading. However, in the design of the proposed development, the potential impact of these planned loads being exceeded was assessed. Where the designed capacity of piped drainage is exceeded, flow will travel over ground along roads; the road infrastructure has been designed to convey overland flow away from highly vulnerable receptors. The proposed wastewater network has been sized in accordance with Irish Water's Code of Practice for Wastewater Infrastructure. In the event of unplanned interruptions to water supply, water will be available to future occupants of the site from on-site domestic water storage tanks. All proposed electricity, gas and telecommunications infrastructure will be provided below ground, where the risk of accidental damage is minimised.

5.6.6 Human Health Impact Determination

Tables 5.5 to 5.7 below contain the results of the screening for health impacts, as described in the IPH 'Health Impact Assessment Guidance', 2009. These tables were completed utilising the information and assessments undertaken in support of this EIAR.

Table 5.5 Step 1 from 'Appendix 2: Screening Tool' of the 'Health Impact Assessment Guidance' 2009, Institute of Public Health (IPH) in Ireland.

Section one: Background and context	
Question	Answer
Title of proposal being screened	Lands at Crodaun, Celbridge
Date screening conducted	01/10/2018 to 15/11/2019
Person(s) involved in the screening process (name, organisation represented and job title if applicable)	Hennie Kallmeyer, Senior Planner at Declan Brassil & Company Ltd.
What stage of development is the proposal at?	Design

Section one: Background and context	
Question	Answer
<p>Briefly outline the importance of the proposal from: An economic/ business perspective</p> <p>A political perspective</p> <p>A community perspective</p>	<p>Residential development with ancillary childcare facility and public open space provision / landscaping to provide a sustainable urban expansion of Celbridge in accordance with identified local, regional and national planning objectives of the area.</p> <p>The proposed development will contribute towards meeting strategic housing and population targets in Celbridge and County Kildare and establishing a critical mass of population in Celbridge that would deliver socio and economic benefits to the wider resident population of Celbridge. .</p>
<p>What resources are available to conduct a HIA? (Consider both human and financial)</p>	<p>Inputs from Design Team and EIAR consultants.</p>
<p>Are decision makers likely to be open to recommendations to amend the proposal?</p>	<p>Yes. Recommendations and mitigation measures to be incorporated into the design of the scheme</p>

Table 5.6 Step 2 from 'Appendix 2: Screening Tool' of the 'Health Impact Assessment Guidance' 2009, Institute of Public Health (IPH) in Ireland. *Where: (L) = Likely Negative Impacts, (U) = Unlikely Negative Impacts, (NK) = Unknown.

Section Two: Potential Impacts on Health Determinants		
Social and Economic Conditions that Influence Health		
Likelihood that the proposal will impact on this health determinant:	Impact*	Groups Affected
Housing	U	No Groups Negatively Affected
Public buildings	U	No Groups Negatively Affected
Commercial buildings	U	No Groups Negatively Affected
Green space (including parks)	U	No Groups Negatively Affected
Other public spaces	U	No Groups Negatively Affected

Road safety and transport infrastructure	U	No Groups Negatively Affected
Communications infrastructure (internet/telephone)	U	No Groups Negatively Affected
Energy sources	U	No Groups Negatively Affected
Waste management infrastructure	U	No Groups Negatively Affected
Water quality	U	No Groups Negatively Affected
Air quality (indoor and outdoor)	L – Short/Medium Term Construction Dust	Urban population
Soil quality	U	No Groups Negatively Affected
Noise	L – Short/Medium Construction Noise	Urban population
Light	U	No Groups Negatively Affected
Other structural issues (list)	None	None
Structural Issues that Influence Health		
Likelihood that the proposal will impact on this health determinant:	Impact	Groups Affected
Housing	U	No Groups Negatively Affected
Public buildings	U	No Groups Negatively Affected
Commercial buildings	U	No Groups Negatively Affected
Green space (including parks)	U	No Groups Negatively Affected
Other public spaces	U	No Groups Negatively Affected
Road safety and transport infrastructure	U	No Groups Negatively Affected
Communications infrastructure (internet/telephone)	U	No Groups Negatively Affected

Energy sources	U	No Groups Negatively Affected
Waste management infrastructure	U	No Groups Negatively Affected
Water quality	U	No Groups Negatively Affected
Air quality (indoor and outdoor)	U	No Groups Negatively Affected
Soil quality	U	No Groups Negatively Affected
Noise	U	No Groups Negatively Affected
Light	L: Increased light pollution from public lighting	Urban population
Other structural issues (list)	None	None

Individual and Family Issues that Influence Health

Likelihood that the proposal will impact on this health determinant:	Impact	Groups Affected
Diet	U	No Groups Negatively Affected
Physical Activity	U	No Groups Negatively Affected
Substance use (legal and illegal)	U	No Groups Negatively Affected
Sexual activity	U	No Groups Negatively Affected
Household income	U	No Groups Negatively Affected
Family cohesion	U	No Groups Negatively Affected
Other individual and family issues (list)	None	None

In each instance, list the groups likely to be affected by the proposal. Examples of difference population groups are listed below:

<p>Infants and toddlers</p> <p>Children and young people</p> <p>Working age people</p> <p>Older people</p> <p>Rural population</p>	<p>Racial and ethnic groups (particularly minority groups)</p> <p>People with particular religious beliefs</p> <p>People with particular political opinions</p> <p>People with disabilities</p>
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Urban population	Chronically ill people
Males/ females	Homeless people
Single/ married people	Unemployed people
Gay/ lesbian people	Economically disadvantaged people
People with dependants	Others

Table 5.7 Step 3 from 'Appendix 2: Screening Tool' of the 'Health Impact Assessment Guidance' 2009, Institute of Public Health (IPH) in Ireland.

Section Three: Screening Outcome	
Question	Conclusion
Overall, health impacts are unlikely or relatively minor and easy to address.	<p><i>Where appropriate, make recommendations to decision makers on how such impacts may be addressed. Do not proceed with HIA.</i></p> <p>The possibility of some negative impacts was detected. In respect of Air and Noise, the suburban population immediately adjoining the site may experience some localised impacts, as a result of dust and noise emissions arising from the construction phase. The assessments undertaken in Chapters 9 and 10 of this EIAR did not consider these impacts to be significant. The potential impacts of noise from additional traffic movements arising from the site were also not considered significant.</p> <p>In respect of Light, the proposed scheme will be lit for public safety. This will increase the light pollution in the area which may impact upon the adjoining suburban population. However, it is considered that the proposed works will also have a positive effect through improved safety and security for public accessible spaces, including open spaces, footpaths and cycle routes which in turn will improve the functionality and increased usage of such facilities.</p>
Overall, health impacts are likely or unknown.	<p><i>Taking into account issues raised in section one, proceed with HIA.</i></p> <p>The development proposed including mitigation measures proposed, will not have a likely negative impact on; Social and Economic Conditions that Influence Health, Structural Issues that Influence Health, or Individual and Family Issues that Influence Health.</p>

Potential direct impacts on human health have been considered in the context of potential environmental pathways and associated transport mechanisms. Table 5.8 contains a Source-Pathway-Receptor (S-P-R) model that seeks to identify potential health impacts, as informed by the assessments undertaken and described in Chapters 7, 8, 9, 10 and 14 of this EIAR.

Table 5.8 Source Pathway Receptor Model for Human Health Assessment Informed by Assessments Undertaken in this EIAR

Source	Pathway	Receptor	Potential Health Impact
Increased emissions to air	Air (Inhalation)	Road users Pedestrians/cyclists Adjoining residents Construction workers	No. Refer to Chp 9. Air, Dust and Climatic Factors.
Fuel Leaks/ Chemical Spills	Soil (direct contact, ingestion, volatilisation)	Road users Pedestrians/cyclists	No. Refer to Chp 7. Soils, Land and Geology
	Surface Water (direct contact)	Adjoining residents Construction workers	No. Refer to Chp 8. Water: Hydrogeology and Hydrology
	Ground Water (direct contact, ingestion)		No. Refer to Chp 8. Water: Hydrogeology and Hydrology
Storm Water Discharge	Surface Water (direct contact)	Road users Pedestrians/cyclists	No. Refer to Chp 8. Water: Hydrogeology and Hydrology
	Groundwater (direct contact, ingestion)	Adjoining residents Construction workers	No. Refer to Chp 8. Water: Hydrogeology and Hydrology
Increased Noise Emissions	Noise	Road users Pedestrians/cyclists Adjoining residents Construction workers	No. Refer to Chp 10: Noise and Vibration
Increased Vibration	Vibration	Road users Pedestrians/cyclists Adjoining residents Construction workers	No. Refer to Chp 10: Noise and Vibration
Increased Light Emission	Light	Road users Pedestrians/cyclists Adjoining residents Construction workers	No. Refer to Chp 14: Landscape and Visual Assessment

5.7 Mitigation Measures

5.7.1 Construction Phase Measures

To prevent impacts on population and human health during the construction phase, the following mitigation measures are proposed:

- Advance notice will be given to the residents of Crodaun Forest Park estate before construction starts and in advance of any major planned disruptions.
- A detailed Construction Management Plan will be prepared by the appointed Contractor to minimise impacts on adjacent residents.
- Construction traffic will be managed to mitigate against potential traffic delays and to facilitate the existing pattern of vehicular movement.
- The mitigation measures in relation to construction, traffic, noise, air quality and landscaping as set out in this EIAR will be carried out in full to minimise impacts on adjacent residents and the population of Celbridge as a whole.

5.7.2 Operational Phase Measures

The predicted impacts of the operational phase of the proposed scheme on population and human health are either insignificant or positive.

No mitigation measures are required in addition to, or beyond the scope of those measures identified in Chapters 7, 8, 9, 10, 11, 12 and 14 of this EIAR. Please refer to Chapter 16 of this EIAR which provides a summary of all proposed Mitigation Measures contained in this EIAR.

5.8 Difficulties Encountered Compiling Information

No significant difficulties were encountered while compiling this information. It is noted that the 'Health Impact Assessment Guidance' 2009 published by the Institute of Public Health (IPH) in Ireland in its screening methodology does not make any allowances for positive impacts on health arising from a proposal. As such, the assessment undertaken in this chapter focused mainly on the identification of any potential negative impacts arising from the proposal.

5.9 Residual Impacts

5.9.1 Construction Phase

Some minor temporary residual impacts on human beings are likely to result during the construction phase. These impacts are mostly related to construction activities and include impacts such as nuisance through noise and air pollution. However, it is anticipated that subject to the careful implementation of proposed remedial and mitigation measures proposed throughout EIAR any likely adverse and significant environmental impacts will be of temporary duration, localised in nature and thereby largely avoided.

5.9.2 Operational Phase

The delivery of the 372 no. dwelling units will significantly contribute to the housing stock available in Celbridge. This new population will contribute to the critical mass of population required for the

provision of services in Celbridge and also boost the trade of local shops and businesses. In this way, no residual negative impacts would be expected.

5.9.3 Do Nothing Scenario

In the absence of development at the subject site, the lands would remain in agricultural use. Thus, the likelihood of any significant adverse impacts on population or human health arising from either the constructional or operational phases of the proposed development would not arise. This 'Do Nothing Scenario' would be contrary to the provisions of the Kildare County Development Plan 2017-2023, and the Celbridge Local Area Plan 2017-2023.

The delivery of an additional 372 no. residential dwellings will significantly contribute to meet a range of objectives relating to delivering housing at a local, regional and national level. The proposed development site is zoned for new residential development and forms a key part of the residential development specified in the Celbridge Local Area Plan 2017-2023. Failure to deliver the proposed residential development would result in appropriately zoned and designated lands not realising its potential to meet growing demand for housing.

5.10 Interactions Arising

The impact of the proposed development on Population and Human Health is addressed throughout the individual chapters of this EIAR. In addition to those impacts set out in this chapter, other aspects that affect human beings include the following:

5.10.1 Population and Human Health / Material Assets: Water Supply, Drainage and Utilities

Chapter 12 identifies that the implementation of the proposed mitigation measures would ensure that the residual impacts on these aspects of the environment arising from proposed water supply, drainage and utilities would be negligible.

5.10.2 Population and Human Health / Air, Dust and Climatic Factors

Mitigation measures to reduce the impact of the construction and operation of the development are addressed in Chapter 9 'Air, Dust and Climatic Factors' and include the implementation of a Construction Management Plan. It is stated in Chapter 9 that the interaction between Air, Dust and Climate Factors and human beings will not be outside the prescribed criteria and is quantified as being not significant for both construction and operational phases of the development.

5.10.3 Population and Human Health / Noise and Vibration

Mitigation measures to reduce the impact of noise and vibration on nearby residents during the construction of the proposed development are discussed in Chapter 10 'Noise and Vibration'. Compliance with the various Limits and Standards for the Construction and Operational Phases of the proposed Project will mitigate against adverse impacts occurring. Construction noise is temporary in nature and is usually experienced over a short- to medium-term period. This characteristic requires it to be considered differently to other longer-term noises. Although construction activities will inevitably result in noise being generated, the predicted noise levels associated with each phase of construction works are predicted to be well below the assessment criteria at the closest Noise Sensitive Receptor (NSR) locations. NSRs that are much further removed than the named NSRs will experience a lower noise impact than those named. The impact assessment has shown that the noise impacts that will be experienced by human beings in the vicinity of the proposed development are within the prescribed

criteria. This interaction is described as negative for the construction phase and neutral for the operational phase. Consequently, it is quantified as Not Significant for both phases.

5.10.4 Population and Human Health / Material Assets: Traffic and Transport

The assessment undertaken in Chapter 11 'Material Assets: Traffic and Transportation' found that temporary negative impacts to human health may be likely during the construction phase due to noise, dust, and air quality arising from increased traffic movements. These impacts will be temporary in nature and are not considered to be significant.

The increased operational traffic as a result of the proposed development has been shown to have a negligible impact in terms of traffic. Accordingly, the associated impact on Human Beings will be limited. Associated air and noise quality impacts arising from traffic will be negligible, as outlined in Chapters 9 and 10 of this EIAR.

5.10.5 Population and Human Health / Cultural Heritage and Archaeology

The assessment undertaken in Chapter 13 'Cultural Heritage and Archaeology' states that Archaeological features which will be excavated in advance of construction activity therefore no negative interactions are anticipated.

5.10.6 Population and Human Health / Landscape and Visual

During the construction phase, the community is likely to experience visual impact due to the new buildings in the landscape. In the longer term, the development will alter the perception of the site for both the local and visiting communities. The impact of the proposed development on landscape and visual aspects is addressed in Chapter 11 of the EIAR. Measures to screen/reduce the visual impact of the scheme on neighbouring residents have been built into the design, with all measures detailed in Chapter 11. No further mitigation measures are proposed.

5.11 References

Central Statistics Office (2016) Census of Population 2016

Kildare County Council - Kildare County Development Plan 2017-2023

Kildare County Council - Celbridge Local Area Plan 2017-2023

Institute of Public Health (IPH) in Ireland. (2009). 'Health Impact Assessment Guidance'.

Tusla Child and Family Agency (2018), 'Register of Early Years Services by County'