CHAPTER 5

POPULATION AND HUMAN HEALTH

QUARRY CONSULTING

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CHAPTER 5: POPULATION AND HUMAN HEALTH

Introduction

5.1 The purpose of this chapter is to evaluate the potential impact of the proposed development on population and human health.

5.2 Whilst there are a range of issues which may impact on human beings (including both population and human health), many of these have been evaluated separately within this EIAR including Land, Soil and Geology (Chapter 7), Hydrology (Chapter 8), Climate (Chapter 9), Air Quality (Chapter 10), Noise and Vibration (Chapter 11), Visual and Landscape (Chapter 12), Traffic (Chapter 13), Heritage (Chapter 14) and Material Assets (Chapter 15).

Professional Competence

5.3 Quarry Consulting undertook the impact assessment presented in this chapter on behalf of McGraths Limestone Works Ltd.. The lead consultant for the EIAR study was Peter Kinghan (Chartered Mineral Surveyor), Post Graduate Diploma in Environmental Engineering. This chapter and the associated assessment has been completed by Irene Curran who is a chartered town planning consultant (MRTPI) with over 20 years' experience. Irene's qualifications are as follows:

- BSc Environmental Science (Honours) – University of Limerick – 1997.
- MSc Town and Country Planning (Distinction) – Queens University Belfast – 2000.
- Dip Field Ecology - University College Cork – 2014.

Legislative and Policy Context

5.4 The introductory text to Council Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment makes it clear that the intention was that EIA would address human health impacts:

> "*Whereas the effects of a project on the environment must be assessed in order to take account of concerns to protect human health, to contribute by means of a better environment to the quality of life, to ensure maintenance of the diversity of species and to maintain the reproductive capacity of the ecosystem as a basic resource for life…".*

5.5 Directive 2011/92/EU (which was amended by Directive 2014/52/EU) on the assessment of the effects of certain public and private projects on the environment makes the requirement to consider population and human health explicit as it introduces into Article 3 'population and human health' as a factor to be considered in Environmental Impact Assessment (EIA):

> ***Article 3***
>
> 1. *The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:*
>
> a) *population and human health;….*

5.6 EIA Directive does not define the term 'human health', however the 2017 EC Guidance on the preparation of the EIAR states:

> "*human health is a very broad factor that would be highly project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from*

major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation and decommissioning of a Project in relation to workers on the Project and surrounding population" (European Commission, 2017).

5.7 The 2022 EPA Guidelines highlight that the term "human health" was used in the Strategic Environmental Assessment (SEA) Directive (2001/42/EC). The Commission's SEA Implementation Guidance states at paragraph 5.26:

'*The notion of human health should be considered in the context of the other issues mentioned in paragraph (f[1]) and thus environmentally related health issues such as exposure to traffic noise or air pollutants are obvious aspects to study.*

5.8 The 2002 EPA EIS Guidelines similarly advised that health be considered through assessment of the environmental pathways through which it could be affected, such as air, water or soil, namely:

'*The evaluation of effects on these pathways (air, water, soil, etc) is carried out by reference to accepted standards (usually international) of safety in dose, exposure or risk. These standards are in turn based upon medical and scientific investigation of the direct effects on health of the individual substance, effect or risk. This practice of reliance upon limits, doses and thresholds for environmental pathways, such as air, water or soil, provides robust and reliable health protectors [protection criteria] for analysis relating to the environment*.' (EPA, 2002)

5.9 In accordance with this approach this chapter addresses population and human health in the context of other factors addressed elsewhere in further detail within the EIAR. The potential direct and indirect effects of the proposed development on population and human health as a consequence of key environmental factors are also considered in the following chapters:

Chapter 7: Land, Soils and Geology.

Chapter 8: Water

Chapter 10: Air Quality

Chapter 11: Noise and Vibration

Chapter 12 Landscape and Visual Impact Assessment

Chapter 13: Traffic.

Chapter 15: Material Assets.

5.10 In 2017, the Institute of Environmental Management and Assessment (IEMA) published the IEMA Primer. The IEMA document posits that human health spans environmental, social and economic aspects and does not merely represent an absence of disease. A broad understanding of human health is put forward, that should encompass factors such as local economy and community, rather than relying on a narrower focus on health. In this regard, the current chapter seeks to address population and human health in a wholistic manner, including

[1] *(f) the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors*. Directive (2001/42/EC).

consideration of economic factors, settlement patterns, landscape and visual impact, and land-use.

Assessment Methodology and Significance Criteria

5.11 The effects of the proposed development on the human environment are assessed in compliance with the EIAR Guidelines as outlined in Chapter 2 (EIA Report Methodology). The evaluation of effects on employment, human health and amenity comprises a qualitative assessment based on the quantitative and qualitative analysis of potential effects on the environment undertaken in other chapters of this EIAR. The assessment also takes into account a review of relevant literature and professional judgement in relation to impact on population and human health.

Study Area

5.12 The site is within the Municipal District of Claremorris – Swinford and within Cong Electoral Division. The following Electoral Divisions (ED's) are within a 5km radius of the application site, these Electoral Divisions have been selected as the study area, unless stated otherwise in this chapter:

- Cong
- Neale
- Cloonbur
- Houndswood

Sources of Information

5.13 The desk-top study of the available data was undertaken to identify the populations of interest and characterise them in terms of their size, socio-economic status and existing health risks. The purpose was to build up a baseline understanding of the environmental and social issues and the characteristics of the communities affected. This information could then inform the assessment of proposed development to determine whether the existing conditions would be affected (positively or negatively) by the proposed development. The following sources of information informed the desk-top study.

- Spatial statistical data relating to the population within the study area has been obtained from the Central Statistics Office (CSO), including information from the 2022, 2016 and 2011 Census and associated data. Data was captured on an Electoral District (ED) basis.
- Information on health profiles and health research have also been obtained from publicly available sources, including those produced by Lenus – The Irish Health Repository – a central source for open access health research in Ireland, the Health Service Executive (HSE) and the Institute of Public Health (IPH).
- Information on landuses and zoning were obtained using the Mayo County Development Plan 2022 – 2028, Myplan.ie, Ordnance Survey mapping, aerial photography, site visits and drone surveys of the site.
- Additional information on tourist attractions and initiatives in the were obtained from the following sources:
  - Fáilte Ireland website – https://www.failteireland.ie/.
  - Walking trails https://www.sportireland.ie/outdoors and http://trails.ie/index.php

- Baseline data from the assessments of other Chapters in this EIAR as well as the design drawings for the proposed development, were also reviewed and informed the impact assessment.

- Site visits were also undertaken to appraise the location and potential impact upon human receptors by the proposed development.

- Information was also obtained from the following sources:

    - Environmental Protection Agency (www.epa.ie).
    - Geohive (http://map.geohive.ie/mapviewer.html).
    - Health and Safety Authority (http://www.hsa.ie/eng/).
    - Pobal (https://maps.pobal.ie/WebApps/DeprivationIndices/index.html).
    - All-Island Research Observatory (AIRO) (https://airo.maynoothuniversity.ie/).
    - https://www.heritagemaps.ie/.

Identification and Description of Potential Effects

5.14 The characteristics of the proposed development were considered and the changes occurring as a result of aspects of the operation and decommissioning of the proposed development were identified. The effect of these impacts on and population and health outcomes (beneficial and adverse) were consequently identified and assessed.

5.15 The assessment of the proposed development focused on those potential impacts most likely to be influenced by the proposed development, namely water, air quality and noise.

5.16 The population and human health assessment addresses effects at a community level rather than for individuals or identifiable properties, although impacts for individual properties are discussed where these are significant or located within proximity to the proposed development, as appropriate.

5.17 The criteria used to describe the predicted effects across land use, social and health considerations are adapted from Table 3.4 of the EPA Guidelines (EPA, 2022).

Table 5.1
Description of Effects

Description of Effects		
Quality of Effects	Positive Effects	A change which improves the quality of the environment (for example, by increasing species diversity, or improving the 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).
Extent and Context of Effects	Extent	Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
	Context	Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Probability of Effects	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.
Duration & Frequency	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).
Direct/Indirect	Direct Effects	Effects that are result directly from the proposed development or project.
	Indirect Effects	Defined by the EC as 'Impacts on the environment, which are not a direct result of the project, often produced away from (the site) or as a result of a complex pathway.'
Cumulative Effects	Cumulative Effects	The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects

Significance of Effects

5.18 The assessment process evaluates how the proposed development impacts on baseline environmental and social factors and considers whether the effects that are associated with positive or negative population and health outcomes. The significance of an effect is informed by the description of the effects (table 5.1 above).

5.19 The significance of an effect can be described as follows (based on Table 3.4 of the EPA Guidelines (EPA, 2022)):

Table 5.2
Significance Criteria

Description of Significance of Effects		
Significance	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.
	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	An effect which obliterates sensitive characteristics.

Baseline Conditions

Land Use & Property

Land Use

5.20 McGraths Limestone Quarry (the overall quarry site) is located in the townland of Cregaree, situated approximately 250m north of the village of Cong in County Mayo. The quarry is approximately 10km south-west of Ballinrobe and 15km north-west of Headford, while Galway is approximately 32km to the south-east.

5.21 McGraths Limestone Quarry is located directly to the north of the R345 from which access is provided . In the vicinity of the access the R345 comprises a marked single carriage road with a 60km/hr speed limit. The access road and lands to the south of the application site (the site) fall within County Galway, while the remainder of the quarry site falls within the bounds of County Mayo.

5.22 The overall quarry site has an extraction area of approximately 62.45 hectares and can be divided into the following three areas (refer to EIAR Plate 1.1):

Area A: This southern section of the overall quarry site extends to an area of 43.47 hectares (Plan Ref File No. Q18). This existing working area benefits from a pre-1963 authorisation with conditions imposed following registration under Section 261 of the Planning and Development Act.

Area B: This section of the overall quarry site consists of an area of 10.58 hectares which has been authorised by way of a substitute consent application (Reference PL

16.SU0132) and a 37L application (Reference QD 16.QD0009) granted by An Bord Pleanála. Permission granted for the extraction of material to 5 mOD.

Area C: This section of the overall quarry site consists of an area of 8.4ha which has been authorised under a Section 34 Application (Plan Ref. File No. 20/77/ ABP Ref: ABP-308748-20) in 2019. Permission provided for the extraction of material to 5 mOD.

5.23 The existing quarry operations comprise extraction of limestone using blasting techniques, processing (crushing and screening) of the fragmented rock to produce aggregates. Ancillary facilities include an office, weighbridge, canteen, toilets and a wheelwash (with side and overhead spray bars).

5.24 The application site (the site) is broadly triangular in shape with a site area of 19ha. The site occupies the northern section of the "overall quarry site" (areas B & C). The overall quarry site is defined by a mix of quarry related uses, including the primary excavation area, processing area, concrete batching plant, asphalt pant and lime plant as well as stockpile storage areas. The boundaries of the overall quarry site are marked by a mix of screening berms and hedgerows with secure fencing in situ.

5.25 The overall quarry site is bounded to the south by the R345 and to the east by the Cong Canal, while to the north and west is agricultural land interspersed with woodland and scrub. Boundaries are mainly defined by fencing and screening berms.

5.26 Landuse in the vicinity of the overall quarry site predominantly comprises agriculture with interspersed large areas of woodland, the most significant of which is associated with Ashford Castle, a medieval castle built in 1228 by the Anglo-Normans that has been turned into a five star hotel, located approximately 1.8km to the south. The village of Cong has a range of other tourist offerings including museums, gift shop, accommodation, pubs, cafes and restaurants.

5.27 The predominant surface water features in the landscape are Lough Corrib, 1.5km to the south and Lough Mask, 2.5km to the north, which are connected by the Cong Canal, which runs in a north to south direction from Thornhill to Cong.

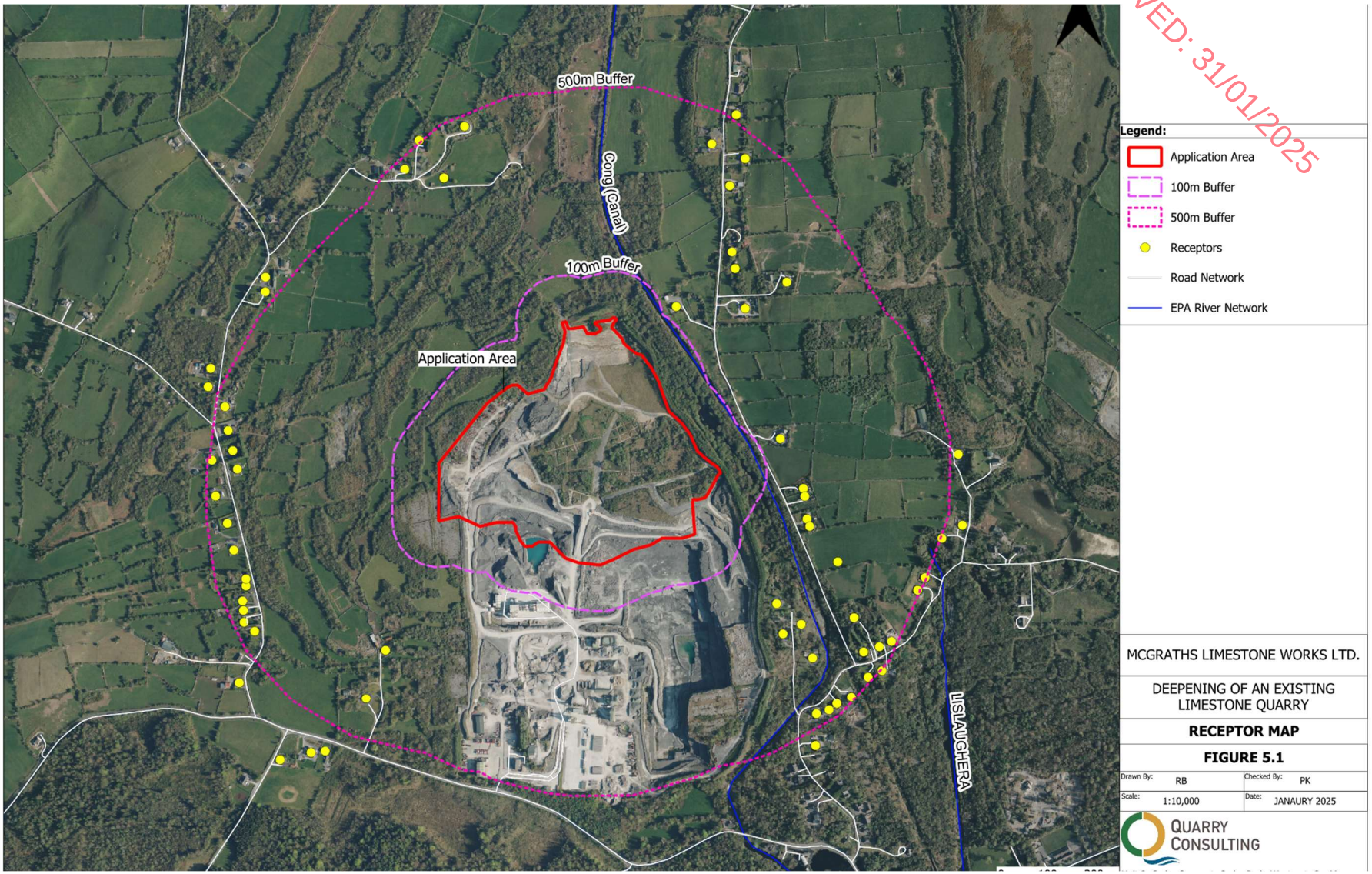
5.28 Inland Fisheries Ireland maintains a salmon hatchery 300 meters downstream of the overall quarry site. The fish hatchery is owned and operated by Inland Fisheries Ireland and was established to supplement salmon stocks in the Corrib catchment area. There are two other quarries located in the vicinity of the site with one located approximately 0.9km to east and another located 1.9km to the northeast. Both quarries are in the region of 1.5 hectares in area and are subject to rock extraction and processing on a small-scale basis. The nearest large-scale quarry is located approximately 10km east of the site.

5.29 Residences within the general area typically consist of one-off rural houses and ribbon development along the local road network. The nearest properties to the site comprise two dwellings situated to the east in the townland of Drumsheel Upper which are within approximately 100m of the site. There are approximately 51 dwellings within 500m of the site (Figure 5.1).

Property Values

5.30 The Data available from the CSO on property values is presented in terms of Eircode Routing Key areas. The proposed development is located within Eircode Routing Key F31: Ballinrobe. The CSO data for October 2024 show that the median price of residential properties sold across the area is c.€195,000. The national median house price is €350,000.

Figure 5.1: Local Receptors



5.31 The demographic information for the area has been sourced from the 2006 – 2022 census data, which is available from the Central Statistics Office. Table 5.3 below provides information on the population figures for the four Electoral Districts within the study area. The information largely paints a picture of an area experiencing population increase, with an overall increase of 15.50% in the population within the Cong ED area since 2006. This increase is above the county figure (10% increase) but significantly below the national figure (20.8% increase).

Table 5.3
Population Statistics

Area	Population 2006	Population 2011	Population 2016	Population 2022	Change 2006-2022	% Change 2006-2020
Ireland	4,239,848	4,588,252	4,761,865	5,149,139	883,688	20.8%
Mayo	123,839	130,552	130,507	137,231	13,392	10%
Cong	823	865	864	974	151	15.50%
Neale	773	780	786	868	95	10.94%
Cloonbur		1098	1120	1267	169*	13.34%
Houndswood	648	650	646	656	8	1.22%

Source: https://data.cso.ie/ *2006 figures not available, therefore change is calculated from 2011-2022

5.32 Information on population density for the area highlights that the population density in Cong ED is almost one third of the national average, with the neighbouring ED's being lower. This highlights the fact that the area is relatively unpopulated.

Table 5.4
Population Density

Area	Population Density 2022 (Persons/Km^2)
Cong	28
Neale	18
Cloonbur	21
Houndswood	21
State	73

5.33 The age profile of people living in the ED is slightly above the national average and may reflect the out-migration from rural areas to cities. Information from Central Statistics office (2021) indicates that the birth rate of 11 for the county has decreased since 2008 when it was 14.6. This follows the same pattern as has been recorded nationally where the rate has fallen from 17 in 2008 to 11.9 in 2021.

Table 5.5
Age Profile

Area	Average Age (2022)
State	38.3
Mayo County	40.2
Cong	40.2
Neale	39.6
Cloonbur	41
Houndswood	42.4

Tourism and recreation

5.34 The National Tourism Development Authority (Fáilte Ireland) periodically collates statistics on overseas visitors to Ireland and regions within the country. Table 5.6 sets out the most recent overseas tourism statistics from 2018 and 2019 for the country and the West region, which includes County Mayo and County Galway. Fáilte Ireland's *Topline Performance by Region* (2017) indicates that that County Galway attracted 1,673,000 overseas visitors making the county the 2nd most popular county for overseas visitors and generating a revenue within the county of €589 million. County Mayo attracted 324,000 overseas visitors making the county the 7th most popular county for overseas visitors and generating a revenue within the county of €78 million.

Table 5.6
Tourism

Destination	No. of Tourists	Revenue Generated
Ireland (2019)	9.7million	€5.6 billion
Ireland (2018)	9.6 million	€5.6 billion
West Region (2018)	1.96 million	€727 million

5.35 Data from the 2022 Fáilte Ireland *Key Tourism Facts,* indicates that there were 13.3 million domestic trips in 2018. The majority of these domestic trips were recorded as short (1-3 days) holiday trips with trips to visit friends/relatives reported at 34% of all domestic trips. Most of these trips are shown to occur in the late summer period (July – September) with the majority of domestic holidaymakers engaging in hiking/walking (54%).

5.36 Counties Mayo and Galway have extensive networks of trails which provide a recreational resource for both visitors and locals. Much of the hiking trails are focused on the west of both counties, including The Western Way and Connemara National Park, however the following trails and loop walks are noted in the study area.

- Coillte Trails: Cong Nature Trail.

- Coillte Trails: Pigeon Hole Loop.
- Coillte Trails: Cong/ Clonbur Trail.
- Coillte Trails: Clonbur Village Loop.
- Coillte Trails: Ballykine Loop.
- Coillte Trails: Big Island Loop.
- Coillte Trails: Ardnageeha Loop.
- Fáilte Ireland Activity Listings 2017: Mount Gable Walk.
- Looped Walks: Seanbothar.
- Looped Walks: Cong Loops.

5.37 The Failte Ireland *Visitors to Attractions Dashboard* provides an overview of visitor numbers to various attractions throughout the country. There is one attraction within the study area; The Quiet Man Museum in Cong, which attracted 4,000 visitors. Other tourist attractions within the study area include (but not limited to):

- Lough Corrib – Angling.
- Lough Mask – Angling.
- Ashford Castle.
- Cong Augustinian Abbey.
- Kelly's Cave.
- Ireland's School of Falconry.
- Ashford Equestrian Centre.
- Petersburg Outdoor Education Centre.
- Seanbothar.

5.38 Other recreational and community facilities and amenities are available in the villages of Cong (500m south of the site, 250m south of the overall quarry area) and Clonbur (4km west of the site). These include GAA clubs (The Neale GAA Club), shops, community hall and churches. Galway City is approximately 32km south of the site.

5.39 Public transportation in the area is very limited, however Bus Eireann operates bus service no. 431 from Claremorris too Carraroe, runs along the R345 south of the site. The bus Eireann service no. 422 runs between Headford and Castlebar via Cong village, 500m south of the site. The nearest train station is located in Claremorris to the north-east or Galway City to the south.

Education & Employment

Education

5.40 The nearest national school to the site is the Cong National Catholic School located approximately 900m south-east of the site. The nearest post-primary school is Colaiste Muire in Tourmakeady, approximately 12km north-west of the site.

5.41 The nearest third level campus is in Galway City - University of Galway and Atlantic Technological University, the latter which also has a campus location in Castlebar.

Employment

5.42 Employment is an important indicator of the economic standing of an area. The Labour Force Survey undertaken by the CSO provides details of unemployment on a regional level. Mayo and Galway are located in the Western Region.

5.43 Table 5.7 illustrates the findings from the Labour Force Survey published by the CSO. The participation rate in the region is very slightly below the national rate, while the unemployment rate is also below the national rate.

Table 5.7
Unemployment and Participation Rates

Location	Unemployment Rate Q1 2024	Participation Rate Q4 2023
State	4.2%	65.4%
West	3.7%	65.1%

Table 5.8
Sectors of Work in Cong and Ireland

	Cong 2022		Mayo 2022		Galway 2022	
Sector	**No.**	**%**	**No.**	**%**	**No.**	**%**
Agriculture, forestry and fishing	27	5.99%	3607	6.18%	4,930	5.74%
Building and construction	41	9.09%	3886	6.66%	5,844	6.80%
Manufacturing industries	63	13.97%	9155	15.69%	14,519	16.90%
Commerce and trade	80	17.74%	11928	20.45%	16,536	19.25%
Transport and communications	24	5.32%	2855	4.89%	5,669	6.60%
Public administration	25	5.54%	3805	6.52%	4,399	5.12%
Professional services	98	21.73%	14099	24.17%	22,962	26.7%
Other	93	20.62%	8999	15.43%	11,042	12.85%
Total	451	100.00%	58334	100.00%	85,901	100.00%

5.44 The population in the Cong ED is categorised by sector of employment as per table 5.8. This shows that the majority of individuals are employed in either professional occupations or commerce and manufacturing. Building and Construction accounts for 9% of the workforce, which is above the percentage for counties Mayo and Galway as well as the national percentage.

5.45 A breakdown of the principal economic status for western region in comparison to that of the state is provided at Table 5.9. The statistics are broadly similar with a notable exception being the percentage of retired people being nearly 2% above the national average.

Table 5.9
Principal economic status in Western region and Ireland

	West 2022		Ireland	
Status	**No.**	**%**	**No.**	**%**
Employer or own account worker	32050	8.18%	308675	7.46%
Employee	181122	46.22%	2008774	48.56%
Assisting relative	292	0.07%	2848	0.07%
Unemployed looking for first regular job	3076	0.78%	34526	0.83%
Unemployed having lost or given up previous job	16053	4.10%	176276	4.26%
Student or pupil	44615	11.38%	459275	11.10%
Looking after home/family	24913	6.36%	272318	6.58%
Retired	69073	17.63%	657790	15.90%
Unable to work due to permanent sickness or disability	17810	4.54%	189308	4.58%
Other economic status	2897	0.74%	27062	0.65%
Population aged 15 years and over	391901	100.00%	4136852	100.00%

Health & Safety

5.46 Health data for individuals is confidential however information from Lenus has been used to establish the baseline health profile of the study area. Lenus has published separate health profiles for the Local Authorities areas in Ireland. The most recent County Health Profiles published date from 2015 and have been used to establish a community health profile for the County Mayo and Galway areas in which the proposed development is situated.

5.47 Key health facts for County Mayo include:

- The rate of mortality from heart disease and stroke, respiratory disease, and injuries and poisonings are recorded as higher than national averages.
- The rate of mortality from cancer remained relatively stable between 2008 and 2012, reflecting the national rate of mortality from that disease.
- The age profile of people living in the area is significantly higher than other parts of the state.

5.48 Key health facts for County Galway include:

- Is the tenth most affluent local authority area nationally.
- The Traveller population of 1.4% is above the national rate of 0.7%.
- Has a low lone parent rate of 9.3% (national 10.9%).
- Has a low birth rate for mothers under 20 years of age at 7.0% (national 12.3%).
- Has the highest incidence rate of male malignant melanoma nationally, but is below average for female malignant melanoma, breast cancer, female colorectal cancer and male and female lung cancer (City and County data).
- Has average or below average mortality for the four main causes of mortality and for all mortalities (City and County data).
- Is below average for male and female deliberate self harm.

5.49 The 2022 census provides information on the percentage of the population that report their health as very good to very bad. Table 5.10 sets out those figures for the study area. These figures illustrate that fewer people in the study area report very bad health relative to the state figures (with the exception of Houndswood) , while the percentage that reported very good health is typically greater than the state figure.

Table 5.10
General Health in the Study Area

Area	Very Good	Good	Fair	Bad	Very Bad	Not stated
Cong	54.83%	34.51%	6.94%	0.80%	0.10%	2.52%
Neale	58.82%	27.19%	9.90%	0.80%	0.11%	3.19%
Cloonbur	53.91%	29.83%	9.31%	1.03%	0.08%	5.84%
Houndswood	54.48%	34.45%	8.35%	0.46%	0.46%	1.82%
State	53.22%	29.66%	8.67%	1.42%	0.33%	6.71%

5.50 The 2022 census provides information on the age profile the population. Table 5.11 sets out the percentage of the population aged 65 and over in comparison to the state figures. The percentage of the population aged 65 and over within the study area is significantly above the national figures.

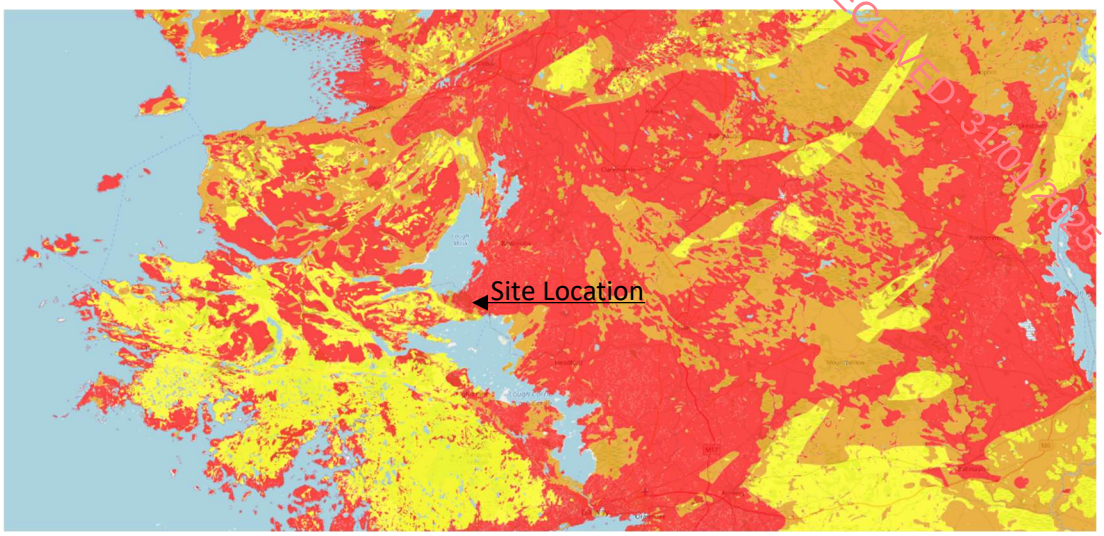
Table 5.11
Percentage of Population Over 65

Area	% of Population over 65
Cong	18.81%
Neale	18.43%
Cloonbur	19.73%
Houndswood	20.64%
State	15.08%

Radon

5.51 The application site falls within a High Radon Area. Radioactivity from radon is measured in becquerels per cubic metre (Bq/m^3). The reference level for radon in homes is 200 Bq/m^3. In a High Radon Area more than 10% of homes may have more than the reference level of radioactivity. The acceptable level, or Reference Level, for workplaces in Ireland is 300 Bq/m^3.

Figure 5.2: Radon Map



Assessment of Potential Effects

5.52 The following assessment considers the operational and post-operational stage effects only as there will be no construction phase associated with the proposed development.

Land-use & Property

Operational Phase

5.53 As the proposed development comprises the deepening of the existing quarry there would be no discernible change in land-use during the operational phase of the development. The existing quarry already has a visual influence over the surrounding area and therefore the change would not be readily discernible from beyond the site boundaries.

5.54 The proposed development is not predicted to have any impact on the local property values as the area has a long association with quarrying and the quarry is well screened from the majority of residential properties in the area. There has been an increase in one off housing in recent years in the vicinity of the quarry particularly to east which shows that quarrying activity to date has not deterred people from living in the area.

Land-use		
	Quality	Negative
	Extent	19ha application site directly affected.
	Probability	Likely
	Frequency	Constant
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	19ha application site directly affected.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.12: EPA Description of Effects – Land-use, operational phase

Post - Operational Phase

5.55 Following the cessation of operations, the application site will be restored. This would result in the removal of all plant and machinery and the switching off of all water abstraction pumps, which would allow water into the quarry void, creating a water feature that would be retained. The remaining overburden would be redistributed to selected locations around the quarry void and allow the quarry sides to revegetate naturally. The land-use would therefore be altered, as outlined in chapter 12 (landscape), the effects of the restored development will not be significant in terms of land-use and property.

Land-use		
	Quality	Positive
	Extent	19ha application site directly affected.
	Probability	Likely
	Frequency	Constant
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	19ha application site directly affected.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.13: EPA Description of Effects – Land-use, post-operational phase

Operational Phase

5.56 The proposed deepening of the quarry would not have any impact on the distribution of population within the study area as it does not include a housing element and the number of individuals employed would not be altered.

5.57 Key pathways for potential effects on residential amenity in this instance are air, traffic and noise & vibration. As with potential effects on human health, these pathways (other than traffic) are controlled by thresholds established by planning conditions and continuously monitored at the site. The quarry has an ISO14001 certification which also requires ongoing monitoring at the site to ensure that environmental emissions are strictly controlled. These emissions have also been assessed in the respective chapters of this EIA and it has been determined that there would be no magnitude of change associated with the deepening of the existing quarry. The combined effect of these potential effects on amenity is therefore anticipated to be negligible. Given that human beings are considered to be a high sensitivity receptor, it is determined that the overall effect would not be significant.

5.58 As the proposed development will not result in an increase in the quarry output, there is no expected impact associated with traffic. A full assessment/review was carried out on the impact of traffic on the R345 and its link capacity (Link Capacity is the assessment of the available carrying capacity of a road based on its characteristics). The assessment concluded that there is significant spare capacity on the route in all assessment years – refer to EIAR Chapter 13.

5.59 There are no proposals to increase the number of employees and hence all staff parking shall continue to be accommodated within the quarry site.

Population	**Quality**	Negative
	Extent	19ha application site directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries. Traffic effects would affect the site access and local road network.
	Probability	Likely
	Frequency	Daily – traffic, noise & atmospheric emissions. Vibration – fortnightly or monthly.
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	19ha application site directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries. Traffic effects would directly impact the site access and local road network.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.14: EPA Description of Effects – Population, operational phase

Post - Operational Phase

5.60 Following restoration, the potential effects on air, noise, and traffic would cease owing to the cessation of extraction and restoration operations, the cessation of machinery operation and the growth of vegetation.

5.61 Following the cessation of the proposed works, the appearance of the application site will have been altered. The effects of the restored development will be negligible in terms of population and settlement patterns.

Population	Quality	Positive
	Extent	19ha application site directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries. Traffic effects would affect the site access and local road network.
	Probability	Likely
	Frequency	Daily – traffic, noise & atmospheric emissions.
	Duration	Short-term
	Reversibility	Reversible
	Direct/Indirect	19ha application site directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries. Traffic effects would directly impact the site access and local road network.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.15: EPA Description of Effects – Population, post-operational phase

Tourism & Recreation

Operational Phase

5.62 It is not anticipated that the deepening of the quarry would have any effect on tourist resources identified above. The existing quarry offers no value for recreational amenity as it comprises mainly private land and it does not contain any paths or recreational facilities.

5.63 The effects of the proposed development would be long-term due to the design life of the proposed development, however the quarrying activity is a long established land use in the area and has not impacted on the tourist amenity of the study area.

5.64 The application site would not be visible from the majority of locations within the study area and existing trees and shrubs will further aid screening as they further mature over time. Noise associated with the deepening of the quarry would be heard from within the nearby woodland walks, however it is unlikely to be of a level that would detract from the visitor's experience.

Tourism	Quality	Negative
	Extent	19ha application site directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries
	Probability	Likely
	Frequency	Daily –Noise & atmospheric emissions. Vibration – fortnightly or monthly.
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	19ha application site directly affected, in addition to parts of Cong wood (nearest recreational resource).
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.16: EPA Description of Effects – Tourism, operational phase

Post - Operational Phase

5.65 Following the cessation of the proposed works, the appearance of the application site will have altered to natural habitat. The effects of the restored development will be negligible in terms of tourism and recreation.

Tourism	Quality	Neutral
	Extent	No effect
	Probability	Unlikely

	Frequency	No effect
	Duration	No effect
	Reversibility	No effect
	Direct/Indirect	No effect
	Significance	Imperceptible

Table 5.16: EPA Description of Effects – Tourism, post-operational phase

Education & Employment

Operational Phase

5.66 The proposed development will continue to provide employment for up to 90 people directly on-site, in addition to a further 50 people indirectly employed including hauliers, sub-contractors, materials suppliers and maintenance contractors. In addition, the proposed development will contribute indirectly to sustaining and developing the local and regional economy through the supply of construction aggregates, concrete and other materials for the construction industry, while agricultural lime is provided for the agricultural sector. This will have greater significance in this area relative to other parts of the country given the relative importance of the construction sector in this area.

5.67 The number of employees would not be altered by this proposed development, however it would sustain the jobs for a longer period of time.

Employment	**Quality**	Neutral
	Extent	90 peoples employment sustained by the proposed development
	Probability	Likely
	Frequency	Constant
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	90 people employed directly, 50 indirectly
	Significance	Imperceptible

Table 5.17: EPA Description of Effects – Employment, operational phase

Post - Operational Phase

5.68 Following the cessation of operations, the application site will be restored. This would result in the loss of jobs within the quarry and related operations. Some short-term employment would be provided in relation to the aftercare of the restored site.

Employment	**Quality**	Negative
	Extent	Employment lost after cessation of operations at the site
	Probability	Likely
	Frequency	Constant
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	Direct & Indirect
	Significance	Slight

Table 5.18: EPA Description of Effects – Employment, post-operational phase

Operational Phase

5.69 The operational phase of the development relates to the deepening of the existing quarry and continued processing of limestone within the quarry area using conventional methods. The key pathways for potential effects on human health in this instance are therefore air, noise, water and soil. Baseline information and predictions of future emissions in relation the key pathways associated with the day to day operations of the existing and proposed development have been used as part of the assessment. These can be compared to various thresholds relevant to each element. The threshold is the level below which no detrimental health effects are expected.

5.70 Thresholds for the existing development are established via conditions attached to the following planning applications that have been approved for the site:

Q18: Conditions imposed on quarry in accordance with quarry registration process under S261 of Planning and Development Act 2000.

73/1614: Permission granted for quarrying on part of the overall site to Clonbur Concrete Group.

91/546: Permission granted for a workshop for storing vehicles.

09/667: Permission granted for the construction of an ESB electricity substation and switch room building.

16/200: Permission granted for the erection and operation of an asphalt mixing plant with a stack height of 21.6m, associated aggregate loading bins and all ancillary facilities on 0.2ha site within the existing quarry.

PL16.SU0132: Substitute Consent granted 08/12/17.

QD16.QD0009: Section 37L permission granted 08/12/17 granted by An Bord Pleanála.

18/724: Permission granted for an extension to the existing workshop/garage and the erection of a machinery storage shed and all associated ancillary facilities.

20/77: Permission (granted by ABP on appeal (ABP-308748-20) for the removal of vegetation and overburden, extraction of rock by blasting and rock breaking means, landscaping and restoration of site and all associated ancillary facilities.

5.71 Compliance with the conditions associated with each of the above is monitored and the results are submitted to Mayo County Council. The site has consistently demonstrated compliance with planning conditions.

5.72 The site is also subject to a water discharge licence issued by Galway County Council (Ref No: W391/05 R1). A water monitoring programme in place at the site to ensure compliance with the licence.

5.73 The potential effects of deepening the existing quarry on land, soils & geology, water, air quality and noise and vibration are set out in chapters 7, 8, 10 and 11 respectively.

Health & Safety	**Quality**	Negative
	Extent	19ha application site directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries. Traffic effects would affect the site access and local road network.
	Probability	Likely
	Frequency	Daily – traffic, noise & atmospheric emissions. Vibration – fortnightly or monthly.
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	19ha application site directly affected. Potential effects on noise and atmosphere may extend beyond site boundaries. Traffic effects would directly impact the site access and local road network.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.19: EPA Description of Effects – Health & Safety, operational phase

Radon gas

5.74 The application site falls within a High Radon Area. Statutory Instrument No.30 (2019) requires employers located in High Radon Areas to test their premises for radon. The acceptable level, or Reference Level, for workplaces in Ireland is 300 Bq/m^3. The EPA protocol for testing workplaces states:

- A workplace is tested by placing one small detector in each occupied room on the ground floor and in the basement.
- Only rooms where a worker spends more than 100 hours per year need to be tested.
- No need to test bathrooms, corridors, storage areas etc.

5.75 The proposed development does not include any internal spaces and the quarry itself is open-cast. Francisa et al (2023) investigated radon concentration in open cast mining work environments and concluded that "*in outdoor workplaces, radon can be considered a low risk to employees' health. The average exposure to radon gas, even in cases where exposure to mineral dust is continuous, did not exceed unsafe values considered by international standards during the measurements*".

5.76 No potential effects on the health of employees working at the site as a result of radon emissions are therefore likely to occur.

Radon Gas	**Quality**	Negative
	Extent	19ha application site directly affected.
	Probability	Unlikely
	Frequency	Rarely – due to nature of the outside working space at the site.
	Duration	Long-term
	Reversibility	Irreversible
	Direct/Indirect	19ha application site directly affected.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.20: EPA Description of Effects – Radon Gas, operational phase

5.77 When rocks containing crystalline silica are cut, crushed, ground, drilled or used in similar industrial processes, dust particles are produced. Some of these particles are very fine – known as respirable crystalline silica or RCS. If high quantities of this very fine RCS dust are inhaled on a regular basis over many years, there is a potential risk that the cumulative effects can cause a lung disease known as silicosis. It is now also accepted that prolonged and intense RCS exposure can cause lung cancer.

5.78 Material that is extracted at the application site comprises Limestone rock, which is then used to produce a range of products including aggregates for concrete, hardcore, farm drainage, earthworks and fill, agricultural lime and high purity calcium carbonate powders. The typical crystalline silica content of Limestone is less than 5%, as calcium carbonate is the primary chemical compound in the rock and not silica.

5.79 The quarry operator has a legal responsibility to adhere to the HSA Safe Quarry Guidelines to Section 26(b)(ii) of the Safety Health and Welfare at Work (Quarries) Regulations 2008 and the EU Directive on Carcinogens and Mutagens in the Workplace - 2017/2398/EC. This latter legalisation sets an occupational exposure limit of 100 µg/m^3 RCS in industrial workplaces.

5.80 Effective dust prevention, protection and control techniques are already in place at the site and the operator has implemented ISO14001, which requires ongoing monitoring of a number of environmental measures, including occupational dust exposure. No potential effects on the health of employees working at the site as a result of silica dust is therefore likely to occur.

5.81 RCS disperses very rapidly (within 1-10m of origin) and therefore concentrations return to background or near background levels very quickly. As a consequence RCS is only a risk to people working directly at the source and without proper PPE and dust management techniques. RCS does not therefore present a risk to the health of the sensitive receptors in the vicinity of the application site.

Silica Dust	**Quality**	Negative
	Extent	19ha application site directly affected.
	Probability	Unlikely
	Frequency	Rarely due to nature of the dust (low silica content)
	Duration	Long-term
	Reversibility	Irreversible
	Direct/Indirect	19ha application site directly affected.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.21: EPA Description of Effects – Silica Dust, operational phase

Unplanned Events

5.82 According to the EPA guidelines, unplanned events, such as accidents, can include "spill from traffic accidents, floods or land-slides affecting the site, fire, collapse or equipment failure on the site". The 2014 EIA directive refers to "major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes)".

5.83 In this instance, the vulnerability of the proposed development to accidents, unplanned events or natural disasters is relatively limited owing to the relatively simple nature of the development works, the established nature of the techniques, regulations and procedures to be followed, the material to be handled on site and the relatively rural location of the proposed works.

5.84 Unplanned events in relation to the proposed development could potentially relate to:

- instability following the extraction of limestone;
- spill from traffic accidents;
- flooding.

5.85 Adhering to the HSA Safe Quarry Guidelines to the Safety Health and Welfare at Work (Quarries) Regulations 2008 should limit the potential for unplanned events in the form of instability in the pit faces. In any event, instability following the extraction of limestone would be unlikely to have any significant impacts on human health beyond the site as there is no public access to the quarry. Therefore, the overall effects are expected to be imperceptible on health and safety in terms of the EIA Regulations

5.86 Chapter 7 (Land Soil and Geology) and Chapter 8 (Water) note that accidental spillages or leaks of fuels or chemicals during site activities could happen without proper control and supervision. Given the scale of the operation, the probability of spillages occurring is very low.

5.87 The traffic and transport assessment, carried out as part of the EIAR (Chapter 13), indicates that existing road network can continue to accommodate the proposed development. It is considered that the risk of an accident resulting in a spillage from development traffic would be no greater in relation to this development than it is for any other form of development that relies on the transportation of goods and materials by HGVs. The potential for significant impacts on employment, human health in the wider population or amenity as a result of a road spillage is likely to be low and any such effects would be temporary.

5.88 On this basis, it is considered that there would be no likely significant temporary or permanent effects on human health during the operational stage.

Unplanned Events	**Quality**	Negative
	Extent	19ha application site directly affected.
	Probability	Unlikely
	Frequency	Rarely – due to existing procedures in place.
	Duration	Long-term
	Reversibility	Reversible
	Direct/Indirect	19ha application site directly affected.
	Significance	Not significant - *an effect which causes noticeable changes in the character of the environment but without significant consequences.*

Table 5.20: EPA Description of Effects – Unplanned events, operational phase

Post - Operational Phase

1.1 Following restoration, the potential effects on human health associated with emissions from the site would cease and the site would be restored. The restoration of the site would not have any effect on human health.

Human health	**Quality**	Neutral
	Extent	No effect
	Probability	Unlikely
	Frequency	No effect
	Duration	No effect
	Reversibility	No effect
	Direct/Indirect	No effect
	Significance	Imperceptible

Table 5.20: EPA Description of Effects – Human Health, post-operational phase

Cumulative Effects / Synergistic Effects

1.2 In the assessment of cumulative effects other permitted and proposed developments in the surrounding area have been considered where they have the potential to generate cumulative effects with the proposed development. Chapter 2 sets out the methodology for identifying those developments which have the potential to cause cumulative effects. It excluded developments that were already constructed as these are already assessed as part of the baseline. Also excluded were small scale developments that would not have the potential to cause cumulative effects.

1.3 A search of the Mayo and Galway County Council online planning search facilities indicates that there are no other planned developments in the vicinity of the application site that have the potential to have any significant cumulative effects with the proposed development.

Land Use & Property

5.89 There are no additional cumulative effects of the proposed development with other developments. Site ownership would not be affected by the proposed development.

Population and Settlement Patterns

5.90 No significant adverse cumulative effects on population and settlement patterns are anticipated.

Tourism & Recreation

5.91 No significant adverse cumulative effects on tourism or recreation are anticipated.

Education & Employment

5.92 No significant adverse cumulative effects on education and employment are anticipated.

Health & Safety

5.93 No significant adverse cumulative effects on health and safety are anticipated.

Do Nothing Scenario

5.94 Under a do-nothing scenario, Mc Graths Limestone Works Ltd. would not deepen the existing quarry and it would remain as an operational quarry until the existing permission ends, with the underlying geology left intact.

5.95 As the site is situated immediately adjoining an existing operational quarry, the existing quarry would continue to operate and the site would continue to have a strong visual association with it.

5.96 There is a continued need for limestone quarries in Ireland to support the country's infrastructure development, construction projects, and economic growth. Limestone quarries provide essential raw materials for the production of aggregates, concrete, and other construction materials, playing a vital role in meeting the demands of a growing population and ensuring sustainable development in line with Ireland's long-term goals and objectives outlined in Project Ireland 2040.

5.97 The application site is situated in a part of County Mayo that is relatively free from constraints such as nature conservation designations, in addition it is located relatively near to a number of urban centres and sources of demand. The do-nothing scenario could result in pressure for alternative, less suitable locations being proposed for quarries to address this short-fall in supply.

Transboundary Impacts

5.98 It is not anticipated that the impacts of the proposed development would have any significant transboundary effects on population and human health.

Interaction with Other Impacts

5.99 It is not anticipated that the effects of the proposed development on population and human health would interact significantly with other impacts.

Mitigation Measures

Operational Phase

5.100 Mitigation measures to be adopted in relation to population and human health during the operational stage will relate to minimising the effect of the development on surrounding sensitive receptors in relation to air, noise, water, soil, traffic and landscape. These measures relate primarily to avoidance, prevention and reduction and are discussed in the relevant chapters of the EIAR and therefore not replicated in this chapter. Measures proposed largely represent a continuation of the existing measures that are in place associated with existing planning consents, discharge licence and the ISO14001 environmental management system.

5.101 The following additional mitigation measures are proposed in relation to Health & Safety as these have not been address elsewhere in the EIAR:

Radon

- Periodic workplace testing will be undertaken in accordance with the guidelines set out in the Protocol for Measurement of Radon in Homes & Workplaces, EPA, 2019.

Silica Dust

- Existing health and safety policies and procedures will continue to be reviewed and updated to ensure it is in keeping with best practice and current legislation.

Unplanned Events

- Existing emergency procedures will continue to be reviewed and updated to ensure it is in keeping with best practice and current legislation.

Post - Operational Phase

5.102 The majority of effects of the proposed development will diminish or cease following the cessation of operations. No specific mitigation measures are proposed in relation to the post operational phase.

Residual Impact Assessment

Construction / Operational Stage

5.103 As outlined in chapters 7 (land, soils and geology), 8 (water), 10 (air quality), chapter 11 (noise), chapter 12 (landscape and visual) and 13 (traffic) of this EIAR, the mitigation measures would successfully reduce the effects of the proposed development during the operational phase.

5.104 Following the implementation of mitigation measures, no residual impacts on population and human health are anticipated in the operational phase of the development.

5.105 As outlined in chapters 7 (land, soils and geology), 8 (water), 10 (air quality), chapter 11 (noise), chapter 12 (landscape and visual) and 13 (traffic) of this EIAR, the mitigation measures would successfully reduce the effects of the proposed development during the post operational phase.

5.106 Following the implementation of mitigation measures, no residual impacts on population and human health are anticipated in the operational phase of the development.

Monitoring

5.107 As outlined in 8 (water), 10 (air quality) and chapter 11 (noise), of this EIAR monitoring in relation to the proposed development will be undertaken in respect of water, air, noise and vibration. On this basis, no specific monitoring is required in relation to population and human health.

Environmental Monitoring Programme

5.108 Noise, dust and water monitoring will be carried out on a regular basis, to demonstrate that the development is not having an adverse impact on the surrounding environment.

Dust Monitoring

5.109 Dust deposition monitoring will be carried out at the application site – refer to Chapter 10. Dust monitoring locations shall be reviewed and revised where necessary. The results of the dust monitoring will be submitted to Mayo County Council on a regular basis for review and record purposes.

Noise & Vibration Monitoring

5.110 Noise & Vibration monitoring will carried out at the application site – refer to EIAR Chapter 11. Noise monitoring locations shall be reviewed and revised where necessary. The results of the noise monitoring will be submitted to Mayo County Council on a regular basis for review and record purposes.

Water Monitoring

5.111 The site will continue to operate an Environmental Management System (EMS) – ISO14001, which will include surface water and groundwater sampling.

Difficulties Encountered

5.112 No significant difficulties were encountered.