



16 Interactions and Cumulative Impacts

16.1 Introduction

This section of the EIAR has been prepared by Tom Phillips + Associates and deals with the likely interactions between effects predicted as a result of the proposed development.

In addition to the requirement under the Planning and Development Regulations 2001 (as amended) to describe the likely significant effects of the proposed development on aspects of the environment, it is also required to consider the interaction of those effects. As such, these are assessed below.

This section addresses the intra-project significant effects (i.e. those occurring between the environmental topics within the project). Inter-project effects (i.e. those which were likely to occur as a result of the likely impacts of the proposed development interacting with the impacts of other projects in the locality) have also been considered and it has been established that there are no other known planned/permitted projects that would have interacted to a significant degree the operational phase of the quarry.

Further detail relevant to the interaction of impacts may be found in the earlier chapters of the EIAR.

16.2 Inter-Relationships/Interactions

It is noted that all aspects of the environments are likely to interact to some extent and to various degrees of complexity. The likely significant interactions between factors arising from the proposed development are set out below.



Table 16.1: Matrix of Interactions Between Environmental Factors

	Archaeology, & Cultural Heritage	Population & Human Health	Biodiversity	Land, Soils & Geology	Hydrology	Air Quality	Climate	Noise & Vibration	Landscape & Visual	Traffic	Waste Mgmt
Archaeology & Cultural Heritage				x							
Population & Human Health					x	x	x	x	x	x	x
Biodiversity					x	x	x				
Land, Soils & Geology											x
Hydrology											x
Air Quality										x	
Climate											
Noise & Vibration										x	
Landscape & Visual											
Traffic											x
Waste Mgmt											



16.2.1 Interaction between Archaeology & Cultural Heritage and Land, Soils & Geology

The interaction between Archaeology & Cultural Heritage and Land, Soils and Geology are discussed in Chapters 7 and 14.

Topsoil will be removed in order to quarry the rock and will be stored at identified locations throughout the quarry. In order to mitigate against such impacts, it is recommended that all ground disturbances, such as topsoil stripping, that are associated with the proposed development, be monitored by a suitably qualified archaeologist.

16.2.2 Interaction between Population & Human Health and Hydrology

The impact of the proposed development on the hydrology and hydrogeology of the area and on the population and human health of the area is assessed in Chapters 5 and 8 of this EIAR.

In terms of the predicted impact on humans, potential health effects arise mainly through the potential for groundwater contamination and impacts on local wells. Hydrocarbons, in the form of fuels and oils, will be used on-site during aggregate extraction.

Due to the local hydrogeological regime, characterised by high rates of surface water runoff and low rates of groundwater recharge, there is very limited potential for effects on groundwater quality. A high proportion of potential groundwater recharge will be rejected due to the low permeability of the underlying bedrock aquifer. Any groundwater will discharge locally to nearby streams

Based on the existing geological and hydrogeological characteristics at the Proposed Development Site, any change in the groundwater vulnerability rating will be minor and will not represent a significant increase in the groundwater vulnerability rating.

The groundwater present at the Proposed Development Site is hosted in bedrock that has a low permeability and groundwater flowpaths will be short.

Therefore, based on the hydrogeological and topographic setting of the Proposed Development Site there will be no significant effects on groundwater levels. Due to the low permeability of the bedrock aquifer any minor effects will be localised.

16.2.3 Interactions between Population & Human Health and Air Quality

The interaction between Population & Human Health and Air Quality is discussed in Chapters 5 and 9.

The primary sources of emissions to air will be associated with plant and machinery undertaking day to day activities such as extraction, onsite processing and transportation of material and dust blow generated during dry, windy conditions. Potential impacts associated with day to day activities have been separated into dust deposition, PM₁₀ and PM_{2.5} emissions.

The results of the dispersion modelling assessment show that dust deposition levels and concentrations of PM₁₀ and PM_{2.5} from the proposed quarrying operations are below the



relevant limit values provided the mitigation measures outlined in Section 9.6 are in place. With proposed best practice mitigation in place the results indicate that the impact of the operational phase (i.e. Proposed Operations Scenario) is **localised, direct, long-term, negative** and **not significant**.

16.2.4 Interactions between Population & Human Health and Climate

The interaction between Population & Human Health and climate are discussed in Chapters 5 and 10.

With design mitigation in place, there are no significant risks to the proposed development due to climate change. In accordance with the EPA Guidelines (EPA, 2022), the significance of effect of the impacts to the proposed development due to climate change during the operational phase are direct, long-term, negative and imperceptible, which is overall not significant in EIA terms.

16.2.5 Interactions between Population & Human Health and Noise & Vibration

The interaction between Population & Human Health and Noise & Vibration are discussed in Chapters 5 and 11.

The operational noise impact from the development includes:

- Operational noise from quarrying activities at the proposed site, this includes the extraction stage.
- Operational noise from quarrying activities and the cumulative impact of the existing operations.

At this stage of the design the exact make and model for each piece of plant and equipment is not known for the quarry, therefore, for the purpose of the assessment the plant and equipment for the quarry has been assessed based on assumed plant and machinery from quarries of similar size and purpose, and reference taken from BS 5228-1. The plant and equipment noise levels should be reviewed at design development stage when the actual make and model of the plant and equipment is known, to ensure that the noise levels for the development achieve the criteria outlined in this report. The typical operational noise sources include:

- Screening,
- Loading material,
- Excavating material,
- Infilling material,
- Lorry's transporting material inwards/outwards.

It can be concluded based on the assessment, the information provided and assumptions outlined in this section that, once operational, noise levels associated with the proposed development will not exceed project criteria provided guidelines outlined in this EIAR are followed.

16.2.6 Interactions between Population & Human Health and Landscape & Visual Impact



The interaction between Population & Human Health and Landscape & Visual Impact are discussed in Chapters 5 and 15.

Landscape value and sensitivity are considered in relation to a number of factors highlighted in the Guidelines for Landscape and Visual Impact Assessment 2013, which are set out below and discussed relative to the proposed development site and wider study area.

This is a robust rural setting of reasonably high integrity located south-west of Carlow town. The study area consists primarily of agricultural grassland and forestry along with a reasonable scattering of rural dwellings. It is a diverse and productive rural landscape where values principally relate to sustaining the local rural economy. There is an existing quarry a short distance to the southeast, which along with the existing quarry within the proposed development site, establishes the extractive industry as part of the baseline landscape setting.

Much of the study area presents has a traditional pastoral aesthetic afforded by a patchwork of small to medium sized agricultural fields within the Barrow Valley and on the Castlecomer Plateau. There are also small sections of riparian vegetation concentrated along the River Barrow as it flows south through the study area providing some localised sense of the naturalistic. Otherwise the vegetation tends to align to the road network and fields within the study area.

On balance of these factors outlined above and in accordance with the criteria set out. The landscape sensitivity is deemed to be **Medium-low**, with localised areas of higher and lower sensitivity throughout the study area.

16.2.7 Interactions between Population & Human Health and Traffic

The interaction between Population & Human Health and Traffic is discussed in Chapters 5 and 13.

For the purposes of the traffic assessment, two separate scenarios will be analysed and their impacts reported. These scenarios are as follows;

- The Do-Nothing scenario will reflect traffic on the surrounding road network factored up to reflect forecast background growth over time.
- The Do-Something scenario builds on the Do Nothing scenario and includes the assessment of expected development related traffic on the surrounding road network. This is considered the 'worst case' scenario.

These scenarios will detail the traffic impacts for the following years;

- YoO (2026);
- YoO + 5 (2031) and
- YoO +15 (2041).

During the operational period, 3 no. staff are expected to be present on site with core work hours as follows;

- 07:00hrs to 18:00hrs - Monday to Friday
- 07:00hrs to 13:00hrs – Saturday

This equates to an estimated approximately 275 no. operational days per year (taking into account anticipated annual leave of staff).



The proposed development is expected to generate a limited number of additional traffic movements on the local network. Based on the number of staff expected to work on site i.e. 3 no., a total of 6 no. staff trips are generated i.e. two LV trips per staff member.

Regarding HV movements, the subject application is for the intake of up to 200,000 tonnes of material per annum. It is noted that a typical payload departing site will be 25 tonnes. This equates to an average of 29 no. HVs arriving and 29 no. HVs departing the site each day (including ad hoc HV trips).

The predicated residual impact of the proposed development in terms of traffic and transportation is that there will be a marginal increase in LVs and HVs on the adjoining road network due to the operation of the proposed development.

16.2.8 Interactions between Biodiversity and Hydrology

A comprehensive Assessment of Biodiversity and Hydrology is provided in Chapters 6 and 8 of this EIAR, respectively.

The River Nore SPA (004233) is located 22km southwest of the proposed development site. The River Nore SPA is located downgradient of the proposed development site via the Dinin River within the River Nore catchment, with only a very small area of the proposed development site located in this catchment. The length of any potential hydrological flowpath would be in excess of 30km. Additionally, there is no surface water discharge from the site to any tributary of the Dinin River. Furthermore, the proposed development site is not connected hydrogeologically with this SPA as the ground water is expected to flow to the east of the proposed development site.

The only nationally protected site hydrologically connected to the proposed development site is the Cloghrystick Wood pNHA (000806), located a minimum of 3.4km overland to the southeast of the proposed development site. The flowpath between the proposed development site and Cloghrystick pNHA is approximately 6km. The Cloghrystick Wood pNHA is located on the eastern banks of the River Barrow downstream of the proposed development site. This pNHA includes some wet woodland adjacent to the river. No direct hydrogeological connection exists between the proposed development site and the pNHA due to the short groundwater flowpaths in the underlying aquifer.

With the application of the identified mitigation measures there is no likelihood of significant negative residual impacts with respect to biodiversity during the construction, operational or restoration (and post-closure) stages of the proposed development. With the implementation of the biodiversity mitigation and enhancement measures it is likely that there will be net positive results for local biodiversity, particularly in the post-closure period.

The design and mitigation measures outlined in Chapter 8 (Hydrology and Hydrogeology) will be effective in minimising any risk to water quality downstream of the site. The accompanying NIS concludes that with implementation of the mitigation outlined that there is no potential for residual adverse impacts upon River Barrow and River Nore SAC or any other Natura 2000 sites in the wider hinterland.



16.2.9 Interactions between Land, Soils & Geology, Hydrology and Waste Management

The interaction between Land Soils and Geology and Waste are outlined in Chapters 7 and 12.

During site walkover surveys and site investigations, no evidence of soil contamination was recorded at the Proposed Development Site. Whilst previous quarrying operations were completed at the Proposed Development Site, there is no evidence of contaminated tailings. The spoil heaps comprise of shale and have begun to revegetate.

According to the EPA online mapping database (www.epa.ie), there are no licenced waste facilities or dump sites within the Proposed Development Site or in the surrounding lands. The closest mapped waste facility is located in the townland of Cappanboe (Site Code: W0158), located ~7.5km to the north-northeast of the Proposed Development Site.

Furthermore, there are no Industrial Emissions (IE) licences/Integrated Pollution Control (IPC) Licence facilities in the immediate area of the Proposed Development Site. The closest mapped IEL licence is located ~1km southeast of the Proposed Development Site. This IEL site is operated by Clogrennane Lime Limited (Carlow) (P0400-03).

The GSI online database (www.gsi.ie) records the presence of several historic quarries in the Clogrennane area. These historic quarries typically date from the early to mid-20th century. No historic quarries are mapped within the proposed lateral extension land which may have contaminated tailings.

16.2.10 Interactions between Air Quality and Traffic

The interaction between Air Quality and Traffic are discussed in Chapters 9 and 13.

As outlined in chapter 9, there is the potential for emissions from road vehicles accessing the site to impact air quality. Pollutants such as NO₂, PM₁₀ and PM_{2.5} are emitted from road vehicles.

The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022), states that road links meeting one or more of the following criteria can be defined as being ‘affected’ by a proposed development and should be included in the local air quality assessment. While the guidance is specific to infrastructure projects, the approach can be applied to any development that causes a change in traffic.

Chapter 13 Traffic & Transport has analysed the predicted increase in traffic volumes based on the proposed extraction of 200,000 tpa of material. As per Chapter 13 and Table 94, the proposed development results in a maximum of 3 no. one-way staff trips and 29 no. one way HGV trips per day. This results in a maximum change of 64 AADT on the L7130 and a maximum change of 58 HDV AADT on the L7130. Therefore, the development does not result in a greater than 1000 AADT change or greater than 200 HGV AADT change. Thus, a detailed assessment of operational phase traffic emissions has been scoped out and there is no potential for significant impacts to air quality from operational phase traffic emissions.



16.2.11 Interactions between Noise & Vibration and Traffic & Transportation

The interaction between Air Quality and Traffic are discussed in Chapters 11 and 13.

The potential for cumulative noise impacts from traffic associated with the proposed quarry operations has been considered. Under the proposed development, there will be a managed transition of quarrying activities from the existing site to the new extraction area. As part of this transition, associated heavy vehicle (HV) movements will also transfer from the existing quarry to the proposed development. There will be no simultaneous or additional HV traffic generated by the two sites operating in parallel. Rather, the proposed development represents a continuation of existing traffic volumes along the local road network, not an intensification. Given that the total volume and routing of quarry-related traffic is expected to remain consistent with current levels, and considering the absence of other significant traffic-generating developments in the area, no cumulative traffic noise effects are anticipated.

16.2.12 Interactions between Material Assets (Waste) and Population & Human Health

The potential impacts on human beings in relation to the generation of waste during the construction and operational phases are that the incorrect management of waste could result in littering, which could cause a nuisance to the public, attract vermin and cause a visual impact. Adherence to the mitigation measures detailed in Chapter 12 and Chapter 5 (Population & Human Health), along with a carefully planned approach to waste management, adherence to the project-specific RWMP (Appendix 12.1) will ensure appropriate management of waste and avoid any negative impacts on the local population. The associated effect will be **long-term, imperceptible and neutral**.

16.3 Cumulative Impacts

A review of the Carlow County Council planning system database was carried out and, no significant permitted or planned projects have been identified.

The majority of permitted developments in the area are residential or agricultural in nature.

Given the nature of the development proposed, no significant impacts are envisaged arising from cumulative impacts with other projects.

16.4 'Do Nothing' Scenario

If the development did not proceed, there will be no cumulative impacts arising.

16.5 Mitigation and Monitoring

It is not proposed that any mitigation or monitoring was undertaken specifically in relation to cumulative impacts.