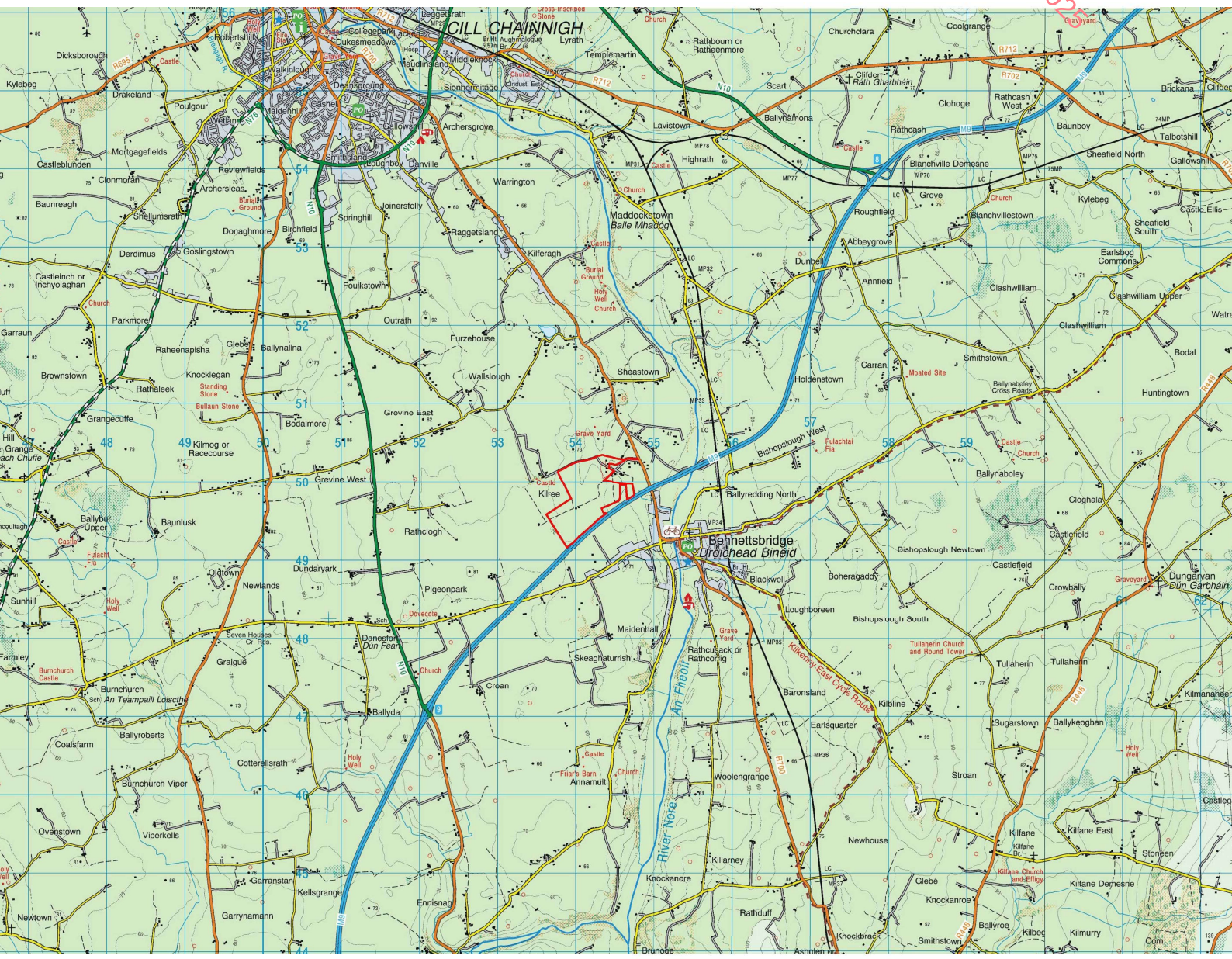
CHAPTER 16

INTERACTIONS



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QUARRY CONSULTING

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CHAPTER 16: INTERACTIONS

Introduction

16.1 The potential effects of the proposed development and the measures proposed to mitigate these effects have been outlined in this Environmental Impact Assessment Report (EIAR). However, in any development with the potential for environmental effect there is also the potential for interaction between effects of the different environmental aspects. The result of these interactions may either exacerbate the magnitude of the effect or may in fact ameliorate it.

16.2 Table 16-1 outlines the different environmental aspects which have potential to interact as a result of the proposed development.

16.3 Interactions have been clearly identified in the early stages of the EIA and where the potential exists for interaction between environmental impacts, the EIA specialists have taken the interactions into account when making their assessment. Potential interactions (both positive and negative) have been considered for the construction, operation and restoration phases of each of the different environmental aspects.

Legislative and Policy Context

Relevant Legislation

16.4 Article 3 of the EIA Directive prescribes that:

> *The environmental impact assessment shall identify, describe and assess in an appropriate manner in light of each individual case, the direct and indirect significant effects of a project on the following factors:*
>
> *a) Population and human health;*
>
> *b) Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;*
>
> *c) Land, soil, water, air and climate;*
>
> *d) Material assets, cultural heritage and the landscape;*
>
> *e) The interaction between the factors referred to in points a) to d).*

16.5 Annex IV of the EIA Directive (2011/92/EU as amended by 2014/52/EU) requires than an EIAR provides "a description of the likely significant effects of the project on the environment resulting from the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources".

Relevant Policy & Guidelines

16.6 The Environmental Protection Agency's (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022) advises that "the interactions between effects on different environmental factors should be addressed as relevant through the EIAR". It advises that a matrix should be included in the assessment to "show where interactions between effects on different factors have been addressed".

Interactive Effects

16.7 Table 16. 1 presents a matrix of interactions likely to occur from the proposed development. The level of interactions between the various media varies greatly.

Table 16-1: Potential Impact Interaction and Key Interrelationships Matrix	Population and Human Health	Biodiversity	Land, Soils and Geology	Hydrology	Climate	Air Quality	Noise and Vibration	Visual and Landscape	Traffic	Heritage	Material Assets
Population and Human Health	-	-	-	-	-	✓	✓	✓	✓	-	-
Biodiversity	-	-	-	✓	-	✓	✓	-	-	-	-
Land, Soils and Geology	-	✓	-	✓	-	✓	✓	-	✓	-	-
Hydrology	-	✓	✓	-	-	-	-✓	-	-	-	-
Climate	-	-	-	✓	-	✓	-	-	-	-	-
Air Quality	✓	✓	-	-	-	-	-	-	-	-	-
Noise and Vibration	✓	✓	-	-	-	-	-	-	-	-	-
Visual and Landscape	-	-	-	-	-	-	-	-	-	-	-
Traffic	✓	-	-	-	-	-	-	-	-	-	-
Heritage	-	-	✓	-	-	-	-	-	-	-	-
Material Assets	-	-	✓	-	-	-	-	-	-	-	-
Corresponding Topic Heading	5	6	7	8	9	10	11	12	13	14	15
Interaction	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
No Interaction	-	-	-	-	-	-	-	-	-	-	-

Overview of Key Interactions

16.8 The following section provides a summary of the potential interrelationships of each of the respective environmental factors during the construction, operation and restoration phases of the proposed development. Each respective chapter of the EIAR provides a thorough assessment of the interactions.

Population and Human Health

16.9 The key interactions affecting human receptors involve air quality, noise, landscape, and traffic, discussed in detail in Chapters 10 (Air Quality), 11 (Noise), 12 (Landscape), and 13 (Traffic). A summary of the interactions is provided below:

- **Air Quality**: Dust emissions during the operational phase have the potential to affect nearby residents. After assessing potential adverse effects, it is concluded that there will be no significant adverse air quality effects on human receptors. Mitigation measures such as screening berms, retention of hedgerows, and using water sprays to control dust during dry conditions are in place. No increase in significance due to interaction.
- **Noise**: Noise emissions from extraction activities, machinery operation, and transport may disturb human receptors. Mitigation measures, including screening berms and regular maintenance of plant equipment, will help maintain noise levels within acceptable limits, ensuring no significant adverse effects on human receptors. No increase in significance due to interaction.
- **Landscape**: The development has the potential to alter visual perspectives from nearby dwellings and recreational spots. A series of viewpoints were analysed, and it was concluded that the proposal to continue and laterally extend the existing quarry would not result in any significant residual landscape and or visual effects and the proposal would not be discernible within the landscape. With the further maturing of the existing screen planting any existing views will be further minimised. No increase in significance due to interaction.
- **Traffic**: Additional traffic due to the development could impact junction delays and road congestion. However, the traffic assessment concluded that junctions and routes will remain within capacity throughout the operational period. With adequate sightlines at the development access point, no road safety issues are anticipated. No increase in significance due to interaction.

Biodiversity

Operational Phase – Interactions with Ecological Receptors

16.10 The proposed continuation and lateral extension of the quarry at Kilree may give rise to several potential ecological impacts during the operational phase. These impacts, and their interactions with important ecological features within the zone of influence of the development, are summarised below:

Habitat Loss, Damage and Fragmentation

16.11 The removal or degradation of vegetation and associated structures may directly impact habitats and wildlife populations.

16.12 Habitat fragmentation may reduce ecological resilience, increase exposure to predation, and inhibit species dispersal.

16.13 Ecological features potentially affected:

Broadleaved woodland, hedgerows/treelines, badger, bats, and bird assemblages.

Disturbance from Human Activity, Noise, and Vibration

16.14 Continuous or intermittent noise and visual activity may alter wildlife behaviour and reduce habitat suitability.

16.15 Vibration from blasting may disturb sensitive species within several hundred metres.

16.16 Ecological features potentially affected:

Badger, bats, otter, and bird assemblages.

Lighting

16.17 Artificial lighting may disrupt nocturnal behaviour and feeding of sensitive species.

16.18 Effects depend on lamp placement, direction, and light spill.

16.19 Ecological features potentially affected:

Bats.

Dust Deposition

16.20 Dust generated by traffic, extraction, and material handling can impair plant productivity and indirectly affect associated fauna.

16.21 Most dust settles within 100–200m of the source, with ecological concern arising above 1000 mg/m²/day.

16.22 Ecological features potentially affected:

Bats and bird assemblages.

Alterations to Hydrogeological and Hydrological Regimes

16.23 Mineral extraction and potential dewatering may alter surface water and groundwater levels.

16.24 This may impact groundwater-dependent ecosystems and hydraulically connected surface waters.

16.25 Ecological features potentially affected:

River Barrow and River Nore SAC; River Nore SPA.

Changes in Water Quality

16.26 There is a risk of contamination from fuel spills, leaks, or polluted runoff, which could degrade aquatic habitats.

16.27 Potential exists for nutrient loading or chemical contamination through surface discharge or percolation.

16.28 Ecological features potentially affected:

River Barrow and River Nore SAC; River Nore SPA.

Post-Operational Phase – Interactions with Ecological Receptors

16.29 No additional significant adverse effects are anticipated in the post-operational phase beyond those identified during the operational phase.

16.30 The progressive restoration of the site to natural habitats is expected to result in long-term positive ecological outcomes, supporting wildlife recolonisation and habitat creation. While specific benefits cannot yet be quantified, effects are expected to be positive at a local level and of ecological benefit.

Land, Soils, and Geology

16.31 In accordance with the EPA EIAR Guidelines (EPA, 2022), the interaction of impacts on the **land, soils, and geological environment** must be assessed in the context of potential receptors and environmental factors addressed in other chapters of this EIAR. The following key interactions have been identified:

- **Dust Emissions**:
  Blasting and mechanical extraction of bedrock may generate increased levels of dust, which has implications for air quality and ecological receptors.
- **Traffic Movements**:
  The operation of extraction and haulage plant contributes to increased traffic volumes, with associated impacts on road safety, infrastructure condition, and residential amenity.
- **Noise Emissions**:
  Plant operations for extraction and haulage are a source of elevated noise levels, with potential to affect local communities and fauna.
- **Water Quality and Hydrogeology**:
  Bedrock extraction may alter surface and groundwater quality and flow regimes, potentially affecting aquatic habitats and water-dependent ecosystems.
- **Biodiversity and Habitat Disturbance**:
  The physical extraction of bedrock and associated activities may result in habitat loss or disturbance, with potential direct and indirect effects on flora and fauna.

16.32 While these impacts are inherently negative, all except the permanent removal of bedrock can be mitigated through the implementation of the existing and proposed environmental management measures. The permanent extraction of bedrock is recognised as an unavoidable consequence of quarrying—an activity deemed essential to support societal infrastructure and development needs.

Water

16.33 In line with the EPA EIAR Guidelines (EPA, 2022), the interaction of hydrological and hydrogeological impacts with other environmental topics must be assessed in an integrated manner.

16.34 Potential interactions may arise between the following EIAR components:

- Ecology and Biodiversity
- Land, Soils and Geology
- Water (Surface and Groundwater)

16.35 These components are inherently interconnected through shared receptors and environmental pathways. However, the detailed assessments and existing and proposed mitigation measures outlined in the relevant chapters demonstrate that no significant negative residual impacts are predicted that would result in cumulative or compounded adverse effects across these environmental factors.

16.36 Based on the conclusions of the Water Chapter and associated residual impact assessments, the proposed development is not expected to give rise to any interacting negative effects within these environmental disciplines.

Climate

16.37 Climate-related interactions, including air quality and water, are discussed in Chapters 8 (Water) and 10 (Air Quality):

- **Water**: Climate change may increase flood risk. The site's quarry extension is not expected to increase flood risk on- or off-site. No increase in significance due to interaction.
- **Air Quality**: Greenhouse gas emissions from site traffic and equipment, along with a temporary reduction in carbon capture due to vegetation removal, may impact air quality. These emissions are not expected to significantly contribute to global GHG levels. No increase in significance due to interaction.

Air Quality

16.38 Air quality interactions primarily affecting human and ecological receptors are detailed in Chapter 6 (Biodiversity) and Chapter 10 (Air Quality):

- **Population**: Dust emissions from quarry operations could affect residents. Mitigation measures, including berms, hedgerow retention, and water sprays, will limit dust impact, resulting in no significant adverse effects. No increase in significance due to interaction.
- **Biodiversity**: Dust could hinder vegetation processes such as photosynthesis. However, mitigations ensure no significant adverse effects on nearby ecological receptors. No increase in significance due to interaction.

Noise and Vibration

16.39 Noise and vibration interactions concerning human and ecological receptors are detailed in Chapter 10 (Noise and Vibration):

- **Population**: Noise from extraction and material transport may disturb residents. Mitigation, including berms and equipment maintenance, help maintain noise limits, ensuring no significant impact. No increase in significance due to interaction.
- **Biodiversity**: Noise emissions will not significantly affect ecological sites, given the site's distance from these areas and the implementation of noise control measures. No increase in significance due to interaction.

Material Assets

16.40 Material assets' interactions with land, soil, and geology are discussed in Chapters 7 (Land, Soil, and Geology) and Chapter 15 (Material Assets):

- **Land, Soil, and Geology**: The limestone extraction and concrete manufacturing, supports construction needs in the area. Once depleted, the resource cannot be renewed, though site restoration efforts are planned to minimise its impact. No increase in significance due to interaction.

Traffic

16.41 **Population**: Increased traffic may result in additional wait times and congestion. However, analysis confirms that junctions will remain within capacity. With appropriate sightlines, no road safety issues are anticipated. No increase in significance due to interaction.

REFERENCES

Environmental Protection Agency (May 2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports