

15 Interaction Between Effects on Different Factors

15.1 Introduction

In an Environmental Impact Assessment Report (EIAR), the interactions between chapters are crucial for providing a comprehensive understanding of how different environmental factors influence each other.

All environmental factors are interlinked to a degree such that interrelationships exist on numerous levels. Interactions within the study area can be one-way interactions, two-way interactions and multiple-phase interactions which can be influenced by the proposed development. As this EIAR has been prepared by a number of specialist consultants an important aspect of the EIA process is to ensure that interactions between the various disciplines have been taken into consideration.

Chapters 5 to 14 have described the potentially significant effects posed by the proposed development upon a variety of environmental receptors. Given the complexity of the proposed development, there is the potential for interaction amongst these impacts that may not be perceived when examined individually, hence, it is necessary to consider the relationships between the impacts.



Each environmental topic chapter of this EIAR includes a dedicated section on interactions with other relevant factors. This approach is considered to meet with the requirements of applicable EU and Irish law. The likely interactions between one topic and another have been discussed under each topic chapter by the relevant specialist consultant. ORS ensured collaboration among specialist consultants to address the likely interactions between effects predicted from the proposed development. This ensured that appropriate mitigation measures were incorporated into the design process.

This section on interactions identifies the potential of unplanned but potential interactions that could occur during construction and operation of the proposed development. **Table 15.1** below identifies where it is predicated, that interactions could occur.

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Table 15.1: Matrix summarising potential interactions noted between factors

Interaction	Biodiversity	Pop. & Human Health	Lands, Soils, Geology	Hydrology & Hydrogeology	Air, Odour, Climate	Noise & Vibration	Landscape & Visual	Traffic & Transport	Archaeology & Cultural Heritage	Material Assets
Biodiversity	N/A	✓	✓	✓	✓	✓	✓	X	X	X
Population & Human Health	✓	N/A	✓	✓	✓	✓	✓	✓	X	✓
Lands, Soils & Geology	✓	✓	N/A	✓	X	X	X	X	X	X
Hydrology & Hydrogeology	✓	✓	✓	N/A	X	X	X	X	X	✓
Air, Odour & Climate	✓	✓	X	X	N/A	X	X	✓	X	X
Noise & Vibration	✓	✓	X	X	X	N/A	X	✓	X	X
Landscape & Visual	✓	✓	X	X	X	X	N/A	X	X	X
Traffic & Transport	X	✓	X	X	✓	✓	X	N/A	X	✓
Archaeology & Cultural Heritage	X	X	X	X	X	X	X	X	N/A	X
Material Assets	X	✓	✓	X	X	X	X	✓	X	N/A

 Interaction
  No interaction

15.2 Population & Human Health

As referenced throughout the report, there are numerous inter-related environmental topics described in detail throughout this EIAR document which are of relevance to human health. This chapter of the EIAR has been instructed by updated guidance documents reflecting the changes within the 2014 EIA Directive. These documents include the EU and Irish guidelines for preparation of an EIAR and carrying out an EIA. Therefore, in line with the guidance documents referred to, this chapter of the EIAR focuses primarily on the potential likely and significant impact on Population & Human Health in relation to health effects/issues and environmental hazards from the other environmental factors and interactions that potentially may occur.

Where there are identified associated and inter-related potential likely and significant impacts which are more comprehensively addressed elsewhere in this EIAR document, these are referred to.

15.3 Archaeology & Cultural Heritage

No interactions were identified in the Archaeology & Cultural Heritage chapter.

15.4 Biodiversity

There are interactions between this Biodiversity Chapter and those of Hydrology & Hydrogeology (Chapter 8), Land, Soils & Geology (Chapter 7) and Landscape & Visual (Chapter 6).

In terms of Land and Soils, there is overlap with the Biodiversity chapter in that the potential impacts of the construction works, through excavation, construction etc., can have an effect on the receiving environment in terms of changes in land use, soil erosion, contamination, or compaction that leads to degradation of soil quality, leading to habitat loss and decreased biodiversity. The mitigation measures in both chapters overlap somewhat as they deal with protecting the receiving environment from the construction works e.g., protecting waterbodies from pollution and sedimentation.

Likewise with Hydrology, potential impacts to ecological receptors downstream of the Site are considered. Biodiversity interacts with hydrology & hydrogeology in several crucial ways. Hydrology, which involves the distribution and movement of surface water, and hydrogeology, which deals with groundwater, both play pivotal roles in sustaining diverse ecosystems. Again, the potential for the Construction Phase to impact on receiving waterbodies and ecology in the vicinity of the Site is addressed via the mitigation measures proposed in the EIAR.

In terms of Landscape & Visual, the proposed landscaping of the Site interacts with its biodiversity and ecology; Biodiversity, floral, faunal, and microbial will benefit from tree planting and tree maintenance and the use of native and naturalised species as prescribed in the planting mix. There will also be a pollinator benefit from the hedgerow specifications, increasing the habitats for bees and other pollinating insects. Adding native and naturalised trees to the landscape has a generalised effect of increasing habitat size and habitat connectivity in the area. It adds to the corridors which connect hedgerows, woodlands, and habitats to each other.

The avoidance of *Fraxinus excelsior*, in the planting plan species mix will not only protect existing landscape trees from the biologically infectious chalara disease, but it will also protect the local habitats that ash supports for as long as possible, by avoiding this biosecurity risk. Avoiding infectious plant diseases in plant selection will also prevent spreading disease to local

tree stands.

15.5 Landscape & Visual Impact

Interactions in respect of the landscape and visual aspects of the proposed development relate to the architectural design of the proposed development and the landscape proposals for the site, as summarised in the design-related mitigation measures in **Section 11.5** of the EIAR.

The landscape proposals also relate to biodiversity on the site, both existing and proposed, in that they seek to protect and conserve habitat of value, most notably along the Ballyduff stream and further downstream receptors, the Avoca River and the Arklow Town Marsh pNHA.

15.6 Land, Soils & Geology

The most significant interactions with Land, Soils And Geology are with the Hydrology and Hydrogeology chapter in terms of water and hydrology. The characteristics and management of Land, Soils & Geology significantly influence both surface water (hydrology) and groundwater (hydrogeology) systems. Due to the inter-relationship between groundwater and surface water the discussed impacts are considered applicable to Chapter 8 (Hydrology & Hydrogeology).

The EIAR identifies how the proposed development might potentially affect the balance between land and soils and water systems. This understanding is crucial for developing effective mitigation strategies to protect soil health and ecosystems and limit adverse environmental impacts to hydrological and hydrogeological receptors.

The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all surface and groundwater legislative limits.

15.7 Hydrology and Hydrogeology

The most significant interactions with Hydrogeology and Hydrogeology are with Land, Soils & Geology and Population & Human Health. Due to the inter-relationship between groundwater and surface water the discussed impacts are considered applicable to Chapter 7 (Land and Soils).

Again, the EIAR identifies how the proposed development might potentially affect the balance between land and soils and water systems. This understanding is crucial for developing effective mitigation strategies to protect water quality, manage water resources sustainably, and prevent adverse environmental impacts to underlying soils.

Hydrology and Hydrogeology also interacts with Biodiversity (chapter 5). With the successful implementation of adequate mitigation measures potential hazards will be managed and the likelihood of environmental incidents occurring is low. Any potential impacts are therefore resolved or minimised.

The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all surface and groundwater legislative limits.

15.8 Air, Odour & Climate

Air quality does not have a significant number of interactions with other topics. The most significant interactions are with population & human health. In an EIAR, chapters focusing on various environmental factors must closely interact with those addressing air quality and climate to ensure a thorough evaluation. Air quality is influenced by emissions from the proposed development, which can stem from construction activities, transportation, and operational processes.

An adverse impact due to air quality in either the demolition, construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits.

Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site.

In an EIAR, the interactions between biodiversity, air quality and climate are crucial considerations for understanding ecosystem health and resilience. Biodiversity, encompassing a variety of plant and animal species, plays a vital role in maintaining air quality by influencing oxygen production, carbon sequestration, and pollutant filtration. Healthy ecosystems help regulate local air quality by absorbing pollutants and releasing oxygen through photosynthesis, thereby mitigating the impacts of human activities on air pollution.

With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land, soils & geology. No other significant interactions with air quality have been identified.

15.9 Noise and Vibration

Noise and vibration interact significantly with other environmental factors to assess potential impacts and propose mitigation measures. Noise assessments consider sources such as transportation, industrial activities, and construction activities associated with the proposed development. They evaluate potential impacts on communities, wildlife, and sensitive receptors.

The chapter's most interlinked with noise and vibration assessments include Population & Human Health (Chapter 6), Traffic & Transport (Chapter 12) and Biodiversity (Chapter 5).

In compiling this impact assessment, reference has been made to the project description provided by the project co-ordinators, project drawings provided by the project architects and traffic flow projections and empirical data associated with the development provided by the traffic consultants. There is also an impact interaction with human health, which has informed Chapter 6 of this EIAR - Population & Human Health.

15.10 Material Assets

Interactions between Material Assets and other environmental topics are outlined throughout this EIAR document. The material assets chapter interacts closely with various other chapters to comprehensively evaluate their impact and propose mitigation measures.

The Material Asset chapter assess how proposed developments may affect material assets through construction activities, changes in land use, and operational impacts. Interaction with chapters on socio-economic factors is crucial to understand the implications on local economies, employment, and community services.

Material Assets is linked with Biodiversity as discussed in Chapter 5. Implementation of successful surface water mitigation measures onsite will ensure the likelihood and consequence of environmental incidents that could impact protected sites downstream of the Ballyduff stream and adjoining Avoca River.

Material Assets interacts with Population & Human Health (Chapter 6). Links between these chapters mainly relate to onsite resource and waste management. Implementing rigorous waste management and cleaning protocols onsite will ensure that hygiene is maintained across site and the risk of vermin infestation is reduced.

Material Assets interacts with Hydrology and Hydrogeology (Chapter 8). The proposed foul, surface water, and public water infrastructure comprising part of the Proposed Development will lead to potential impacts on the surrounding networks.

Material Assets interacts with Traffic and Transport (Chapter 12). The proposed construction and operational phase of the development will generate a minimal impact on the road network in the vicinity of the site. The proposed mitigation measures proposed in **Section 12.6** (Chapter 12) will also help reduce or eliminate any potential impact associated with the proposal. The proposal, off the L6187 Local Road, close to the L2190 local road, is located in an 80km/h speed limit zone and the narrow road width of the L6187 will not give rise to potential hazards, on the other hand, will reduce traffic speeds and increase road safety benefits. Queuing of vehicles is not anticipated on the L6187 due to the low number of vehicles predicted to enter the site on a daily basis. The proposal will have no negative impact on the overall road network associated with the proposed construction and operational phase of the site.

15.11 Conclusion

This chapter has summarised and addressed the interactions between environmental topics as discussed within the preceding chapters of the EIAR.

The purpose of this chapter of the EIAR is to draw attention to significant interaction and interrelationships in the existing environment.

In preparing and co-ordinating this EIAR, ORS ensured collaboration between the specialist consultants who in turn dealt with the likely interactions between effects predicted as a result of the proposed development, ensuring that appropriate mitigation measures were incorporated into the design process where relevant.

By addressing these interactions comprehensively, this EIAR not only meets regulatory requirements but also strives to promote sustainable development practices that safeguard natural resources and limit adverse effects from the proposed development to the receiving environment.