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TABLES

Introduction

15.1 All of the reasonably predictable significant impacts of the proposed development and the measures in place to mitigate them are outlined in the EIAR. However, for any development with the potential for significant environmental impacts there is also the potential for interaction amongst these impacts. The result of these interactions may either exacerbate the magnitude of the impact or ameliorate it. The interaction of impacts on the surrounding environment is required to be addressed as part of the Environmental Impact Assessment process.

15.2 Article 3 of Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending ('EIA Directive') stipulates that:

'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; (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).'

Interaction of Environmental Factors

15.3 Where relevant, the interaction between various environmental topic areas, are already addressed within each of the individual assessment or chapters of this EIAR. For example, there are clear overlaps between the land, soils and geology assessment and the hydrological conditions at the site. The purpose of this chapter is to draw attention to significant interactions and interdependencies between one topic and another where they may otherwise be missed.

15.4 **Table 15-1** provides a matrix to examine the main interactions and interdependencies between specific environmental sensitivities given the findings of the preceding chapters of the EIAR. A supporting commentary is provided below, which explains the main interactions of note between the environmental topic areas in the context of the application site / proposed development, and effectively provides a check to ensure that no potential for interaction of impacts has been overlooked in the individual assessment.

15.5 A matrix method has been used, in which the environmental components addressed in the previous Chapters of this EIAR have been placed on both axes of a matrix. Where interactions potentially arise between two environmental components, the intersection square along a row or column of the matrix in **Table 15-1** is shaded green.

15.6 Full details of the significance of the effects and the relevant interactions of the environmental aspects along with any proposed mitigation are discussed within each of the individual preceding Chapters which included:

- Chapter 4 Population and Human Health;
- Chapter 5 Biodiversity;
- Chapter 6 Land, Soils and Geology;
- Chapter 7 Water (Hydrology and Hydrogeology);
- Chapter 8 Air Quality;
- Chapter 9 Climate;

- Chapter 10 Noise;
- Chapter 11 Material Assets;
- Chapter 12 Cultural Heritage;
- Chapter 13 Landscape; and
- Chapter 14 Traffic.

Population and Human Health

15.7 Potential effects on human health should be considered in relation to relevant pathways (such as air, soil and water) and should be considered in the context of accepted standards for exposure, dose or risk.

15.8 This EIA Report indicates that the proposed sand and gravel extraction and restoration works at the application site could proceed with acceptable emission limits for noise and dust emissions, while potential effects on soil and water could be adequately addressed through good environmental management practices and mitigation measures to avoid accidental spillages of fuel, etc.

15.9 The key matters in relation to amenity are noise, dust, landscape and traffic. As previously noted, this EIA Report has established that the proposed extraction and restoration works can proceed within acceptable levels for noise, dust and traffic effects.

15.10 The design of the landscape plan and restoration proposals for the proposed development have been developed in tandem with the landscape and visual assessment, and have taken advantage of opportunities to enhance and augment natural topography/planting conditions to further reduce the potential for effects. This is an example of a positive interaction through the environmental assessment report, to the benefit of population receptors and cultural heritage resources.

15.11 The traffic assessment undertaken during the EIA process and described in Chapter 14 concludes that the road infrastructure is capable of carrying the projected traffic associated with the proposed development, but it identifies opportunities to enhance the road safety by improving visibility sightlines at the access and the potential to enhance passing opportunities on local roads to enhance traffic flow, thereby improve ease of movement for local receptors.

15.12 The proposed development represents a local employment opportunity as well as an opportunity for wider economic development through the supply of an aggregate commodity that is in scarce supply in the region. A review of material assets has been undertaken to ensure continuity of supply to essential local services.

Biodiversity

15.13 There will be some habitat loss during excavation of certain works areas. There has been considerable interaction between the biodiversity specialists and the landscape design team in terms of ensuring that the habitat losses will be compensated by replacement planting to provide high value, native habitat for faunal species. Similarly positive interactive effects have been predicted / provided for through the retention of a natural regeneration area and the provision of a protective buffer around a pond habitat for newts and frogs to the east of the proposed extraction area.

15.14 The land and soil, water, noise and air assessments have been undertaken with reference to accepted guidance on the acceptability of impacts in relation to human and ecological receptors, and all available mitigation measures are incorporated to the design and

operation of the proposed development to minimise the potential impacts to these receptors even further.

Land, Soils & Geology

15.15 The design of the proposed development incorporates all recent, available best practice guidance in relation to soil management and handling to reduce the potential for impacts on biodiversity (maintaining the quality of habitat), local population / health (e.g. reducing the potential for dust from stockpiles, general environmental screening) and water quality (reducing potential for compaction or silt-laden run-off).

15.16 The land resource potential of the application site is maximised through the enabling of extraction and use of much needed aggregates for the building requirements of the national economy, whilst facilitating the return of the lands following extraction to its existing agricultural use. The proposed development will also allow for cultural benefits by providing for the recording of potential artefacts that may be discovered during text excavations pre-development.

Water (Hydrology and Hydrogeology)

15.17 Chapter 7 of the EIAR identifies possible hydrological pathways for the mobilisation of any potential contaminants that could arise as a result of the proposed development. The water assessment provides a fundamental basis of the ecological assessment and the potential for impacts at ecologically sensitive sites.

15.18 Based on an assessment of the component activities entailed in the proposed development the key management actions to ensure that the potential leakage of any soils/contaminants (such as hydrocarbons) into these pathways are identified.

15.19 The water assessment also interacts closely with the population and human health assessment, both in terms of avoiding the potential of any contaminants entering a hydrological pathway and causing harm to human health, but also by ensuring that the quality of water for health and sanitary uses on site is of the standard required for human health and by ensuring that activities on site will not impact on water availability for the local community (e.g. reducing groundwater availability in local surrounding wells). Suitable drainage and flooding potential investigated in Chapter 7 are important considerations for local human receptors, material assets and possible climate change vulnerability.

Air Quality

15.20 The main air quality impacts are associated with the potential for dust emissions due to the earthworks and the material to be handled at the proposed development. The potential for dust arisings is assessed in relation to established guidelines on the acceptability of dust levels. Numerous mitigation measures are proposed to ensure that any potential for impacts on local residents and ecological receptors are minimised further. The potential for air quality impacts from traffic emissions is also assessed in relation to established guidelines.

15.21 Land resources (soils and subsoils) removed as a result of earthworks are to be used to maximise the potential screening effect from fugitive dust.

Climate Change

15.22 The resilience of the application site and proposed development is considered in Chapter 9 in relation to its suitability (for example in relation to water attenuation / flooding susceptibility) and potential for adaptation.

15.23 The greenhouse gas emissions predicted are c. 0.00122% of Ireland's current annual CO2e emissions. In line with the obligations of wider society and in accordance with Government policy and economic drivers (interaction with Population and Human Health), Breedon Ireland will continue to move with scientific developments in terms of reducing carbon emissions from its operations.

Noise

15.24 The noise assessment described in Chapter 10 was undertaken with close consideration of the local resident settlement pattern. The prediction of potential impacts has been modelled on the likely impacts at each of the closest, representative residences. The assumptions on noise generated is also closely aligned to the assumptions regarding traffic to be generated as a result of the proposed development. Best practice guidance in relation to acceptable noise limits in relation to ecologically sensitive areas.

15.25 Land resources (soils and subsoils) removed as a result of earthworks are to be used to maximise the potential screening effect they represent as screening berms to protect local human/ecological receptors from noise emissions from the site.

Material Assets

15.26 The main interactions between material assets and other topic areas are in relation to disturbance to the local population in terms of amenity and utility service (including waste management and water supply) provision. By definition traffic infrastructure (Chapter 14), land use (Chapter 6) and cultural heritage (Chapter 12) also interact with the wider Material Assets topic area.

Cultural Heritage

15.27 As stated earlier, the proposed land and soils handling raises an opportunity for discovery and recording of any artefacts discovered in the pre-development archaeological testing. Landscape proposals, namely the construction of a grassed 2m high screening berm and natives species planting enclosing the extraction area, will protect the setting of the Barrow recorded monument to the east of the application site. Cultural heritage is inherently linked with the Population topic area, and the return of the application site to an agricultural use following extraction of resources is also a positive interaction.

Landscape and Visual

15.28 As can be seen through the preceding sections, the landscape and visual assessment has interactions with a substantial number of the other topic areas of the EIA. The landscape and restoration proposals of the proposed development have been developed with the objective of providing the maximum ecological habitat benefits, contribution to cultural heritage (native species planting) and screening opportunities to reduce the potential of noise, dust and adverse views).

Traffic

15.29 The assumptions in relation to traffic generation have been fundamental to the noise and air quality assessments given that the emissions from HGVs are identified as one of the core activities with potential for such impacts. The potential for traffic congestion or disturbance to amenity is also a key consideration in terms of impacts to population and human health. Internal management of machinery is important in terms of avoiding soil compaction, as outlined in Chapter 6 of the EIAR.

Table 15-1 Interactions of the Foregoing

	Population & Human Health	Biodiversity	Land, Soils and Geology	Water	Air	Climate	Noise	Material Assets	Cultural Heritage	Landscape and Visual	Traffic
Population & Human Health											
Biodiversity											
Land, Soils and Geology											
Water											
Air											
Climate											
Noise											
Material Assets											
Cultural Heritage											
Landscape and Visual											
Traffic											

Mitigation and Residual Impacts

15.30 Where any potential interactive negative impacts have been identified in the above, a full suite of appropriate mitigation measures has already been included in the relevant sections (Chapters 5-14) of the EIAR. These mitigation measures are presented in a consolidated version in Chapter 16.