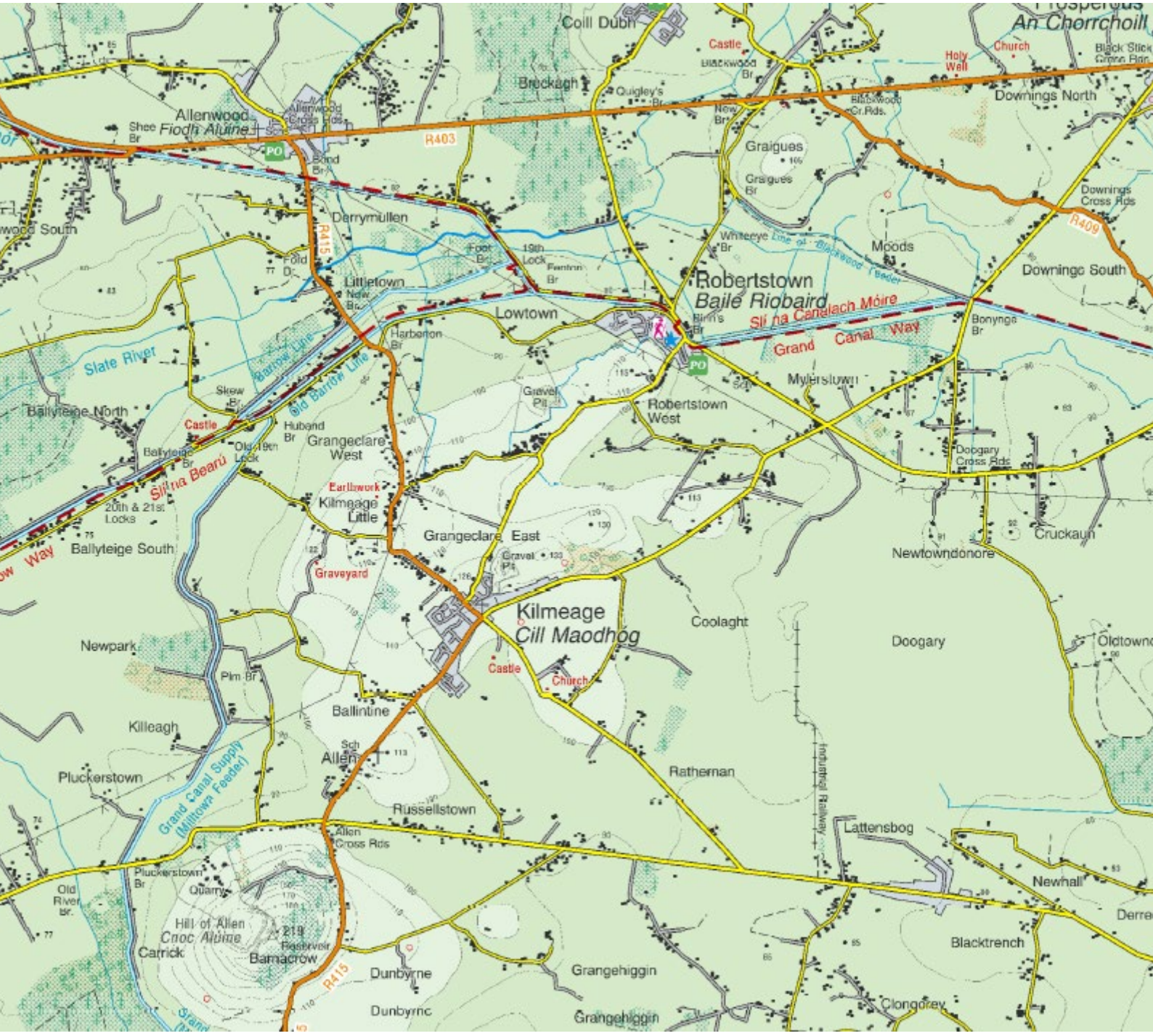
CHAPTER 16

INTERACTIONS AND COMBINED EFFECTS



QUARRY CONSULTING

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CHAPTER 16: INTERACTION OF THE FOREGOING

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.

16.4 This chapter also provides an assessment of the cumulative effects of the proposed development with other developments. This assessment aims to identify the likelihood for cumulative effects to occur during the construction and operation of the Proposed Development, and where possible, to identify the possibility for significant effects.

Legislative and Policy Context

Relevant Legislation

16.5 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).

16.6 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….(e) 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

16.7 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".

16.8 Cumulative effects can result from 'individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location' (CIEEM, 2016). The Environmental Protection Agency's 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (May 2022) defines cumulative impacts as:

> 'The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects. While a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or significant), result in a cumulative impact that is collectively significant. For example, effects on traffic due to an individual industrial project may be acceptable however it may be necessary to assess the cumulative impacts taking account of traffic generated by other permitted or planned projects. It can also be prudent to also have regard to the likely future environmental loadings arising from the development of zoned lands in the immediate environs of the proposed project.'

Assessment Methodology and Significance Criteria

Interactive Effects Methodology

16.9 The consideration of interactive effects was an integrated process which commenced at the very outset of the project. At the initial stage of preparing the EIA for the proposed development, the potential for significant interactions between environmental factors were examined and any potential effects were identified. These potential effects were included in the scope and addressed in the baseline and impact assessment studies for each of the relevant environmental factors.

16.10 The interaction of effects within the proposed development in respect of each of the environmental factors, listed in Article 3(1) of the EIA Directive, have been identified and addressed in detail in the respective chapters in this ER. Thus, no additional mitigation is proposed in this chapter.

16.11 This chapter presents a summary of each assessment of the interaction of effects between the various environmental factors. A matrix showing "*where interactions between effects on different factors have been addressed*" is set out in Table 16.1.

Cumulative Effects Methodology

16.12 As with the interactive effects, the assessment of cumulative effects commenced at the outset of the project. The first step comprised the identification of a list of all developments within 5km of the application site as well as other proposals for sand and gravel extraction within County Kildare This list was then narrowed down to include only those projects where there was potential for significant cumulative effects arising in combination with the proposed development. To do this, the following were considered:

- Whether the project has been completed, or currently in the planning system. If a project was identified as completed, it has been considered as part of the baseline as appropriate. If planning had expired, the project was not included for assessment.
- Whether there is a likelihood of temporal overlap (including overlap for construction periods) between the proposed development and the other project.
- Whether the scale and nature of the other project is likely to significantly contribute to the effects of the proposed development on the environmental aspects.

16.13 Information on the shortlisted projects was obtained from the following sources:

i. Planning application documentation and supporting environmental assessments obtained via Kildare County Council, National Planning Application Database (myplan.ie), An Bord Pleanála and the EIA Portal.

Interactive Effects

16.14 The interactions between the identified environmental factors have already been considered and assessed within the individual chapters of this report. 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. If the development does not have the potential to impact or affect the interaction then that interaction is shaded grey. If there is a potential for an interaction it is shaded green.

16.15 The following section provide 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.

Table 16-1
Potential Impact Interaction and Key Interrelationships Matrix

	Population and Human Health	Biodiversity	Land, Soils and Geology	Hydrology	Climate	Air Quality	Noise	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

Interaction

No Interaction

Overview of key Interactions

Population and Human Health

16.16 The critical interactions concerning human receptors with air quality, noise & vibration, landscape, and traffic are discussed in detail in Chapters 10 (Air Quality), 11 (Noise & Vibration), 12 (Landscape), and 13 (Traffic). A summary of the potential interactions is provided below:

Air Quality: Dust emissions associated with operational phase of the development have the potential to affect residential receptors. After an assessment of potential adverse effects produced by the development it was concluded that there would be no significant adverse air quality effects for human receptors. This takes into account mitigation measures such as screening berms, retention of hedgerows, location of plant within pit void, and the use of water sprays to moisten surfaces during periods of dry weather. No increase in significance due to interaction.

Noise: Noise emissions associated the removal of trees in addition to the extraction activities, which include the use of machinery and the transport of material to and from the site have the potential to cause disturbance to human receptors. After an assessment of potential adverse effects produced by the development it was concluded that there would be no significant adverse noise effects for human receptors. This takes into account mitigation measures such as screening berms, maintenance of plant, location of plant on the pit floor. No increase in significance due to interaction.

Landscape: The introduction of the development at this location has the potential to alter views from residential dwellings or to undermine the quality of a view from a recognised leisure spot. A series of viewpoints were selected which assessed the development from this perspective. The assessment concluded that the development would be imperceptible from the majority of viewpoints, with two viewpoints (north of the site) noting a moderate change, which comprises the alteration of the profile of the ridge. The extraction area would not be visible from the majority of locations. No increase in significance due to interaction.

Traffic: The increased traffic associated with the proposed development has the potential to result in increased waiting at junctions and congestion on routes. The traffic assessment and junction capacity analysis concluded that the routes and junctions would continue to operate within capacity for all assessed years and therefore the overall effect would be imperceptible. The development access has adequate sightlines and therefore no road safety issues should arise. No increase in significance due to interaction.

Biodiversity

16.17 In relation to biodiversity there is potential for interaction with air quality and noise & vibration, and these interactions are addressed in Chapter 8 (Water), Chapter 10 (Air Quality) and Chapter 11 (Noise & Vibration). A summary of the potential interactions is provided below:

Water: Due to the fact that the site does not drain directly to any river waterbody or drain network, no significant effects on river waterbodies are likely. Ballynafagh Lake SAC is located approximately 5km to the northeast of the site and is potentially located downstream of the site with regard groundwater flows only. Any affect is unlikely due to the distance to the receptor and to the low potential for contamination of groundwater on the site. No increase in significance due to interaction.

Air Quality: Dust emissions associated with operational phase of the development can affect photosynthesis, respiration and transpiration. After an assessment of potential adverse effects produced by the development it was concluded that there would be no significant adverse air quality effects for ecological receptors. This takes into account mitigation measures such as screening berms, location of plant within pit void, and the use of water sprays to moisten surfaces during periods of dry weather. No increase in significance due to interaction.

Noise: Given the distance between the site and the nearest designated ecological site, noise associated with the construction and operation is unlikely to have significant effects. Appropriate mitigation measures have been recommended to ensure the noise limits are not exceeded. No increase in significance due to interaction.

Land, Soils and Geology

16.18 In relation to Land, Soils and Geology there is potential for interaction with water, air quality, heritage and material assets. These interactions are addressed in Chapter 8 (Water), Chapter 10 (Air Quality), Chapter 14 (Cultural Heritage) and Chapter 15 (Material Assets). A summary of the potential interactions is provided below:

Water: Contaminants or leakages from plant and vehicles could potentially leak into surface water and ground water via soils, which could have an effect on water quality. There are no surface water flowpaths to any watercourses in the area. There is a potential groundwater connection however any effect is unlikely due to the low potential for contamination of groundwater on the site. No increase in significance due to interaction.

Air Quality: The interaction arises due to the potential for dust emissions associated with the removal of the sand and gravel resource from the site. As discussed above, measures are proposed to reduce dust emissions. No increase in significance due to interaction.

Cultural Heritage: The interaction arises due to the potential loss or damage to unknown subsurface archaeological artefacts. It has therefore been proposed that topsoil-stripping should be monitored by a qualified archaeologist. No increase in significance due to interaction.

Material Assets: The interaction arises due to the removal of both the trees and the sand and gravel resource from the site. The site is recognised on the GSI Aggregate Potential Map as having high potential for "granular aggregate potential". Both materials would provide potential resources for the construction industry in County Kildare and wider region and therefore a potential benefit in terms of material assets. Once exhausted, the sand and gravel resource cannot be replenished, though it is proposed to import materials as part of the site restoration, the effect of the loss of the sand and gravel would not therefore be visible. It is proposed to replant the trees as part of the proposed restoration. No increase in significance due to interaction.

Water

16.19 In relation to water there is potential for interaction with population, biodiversity and land, soils & geology. These are addressed in Chapter 5 (Population & Human Health), Chapter 6 (Biodiversity) and Chapter 7 (Land, Soil & Geology) of the EIAR. A summary of the potential interactions is provided below:

Population: Contaminants or leakages from plant and vehicles could potentially leak into surface water and ground water which could have an effect on water quality. Due to the fact that the site does not drain directly to any river waterbody or drain network, no significant effects on river waterbodies are likely. There is a potential groundwater connection however any affect is unlikely due to the low potential for contamination of groundwater on the site. No increase in significance due to interaction.

Biodiversity: Due to the fact that the site does not drain directly to any river waterbody or drain network, no significant effects on river waterbodies are likely. Ballynafagh Lake SAC is located approximately 5km to the northeast of the site and is potentially located downstream of the site with regard groundwater flows only. Any affect is unlikely due to the distance to the receptor and to the low potential for contamination of groundwater on the site. No increase in significance due to interaction.

Land, Soil, Geology: Contaminants or leakages from plant and vehicles could potentially leak into surface water and ground water via soils. Due to the fact that the site does not drain directly to any river waterbody or drain network, no significant effects are anticipated. There is a potential groundwater connection however any affect is unlikely due to the low potential for contamination of groundwater on the site. No increase in significance due to interaction.

Climate

16.20 In relation to Climate there is potential for interaction with water and air quality. These are addressed in Chapter 8 (Water) and Chapter 10 (Air Quality) of the EIAR. A summary of the potential interactions is provided below:

Water: The impact of climate change on water resources relates to the potential increased risk of flooding. The proposed development will not increase

the risk of flooding at any on or off-site locations. No increase in significance due to interaction.

Air Quality: The interaction arises due to the potential for greenhouse gas emissions from site traffic and plant. The removal of trees from the site would also reduce potential for carbon off-setting in the short term. Based on the scale and extent of proposed activities, GHG emissions are assessed as not making a significant contribution to the global atmosphere. No increase in significance due to interaction.

Air Quality

16.21 In relation to air quality (in particular dust deposition) there is potential for interaction with human and ecological receptors, and this is addressed in Chapter 6 Biodiversity and Chapter 10 (Air Quality).

Population: Dust emissions associated with operational phase of the development have the potential to affect residential receptors. After an assessment of potential adverse effects produced by the development it was concluded that there would be no significant adverse air quality effects for human receptors. This takes into account mitigation measures such as screening berms, retention of hedgerows, location of plant within pit void, and the use of water sprays to moisten surfaces during periods of dry weather. No increase in significance due to interaction.

Biodiversity: Dust emissions associated with operational phase of the development can affect photosynthesis, respiration and transpiration After an assessment of potential adverse effects produced by the development it was concluded that there would be no significant adverse air quality effects for ecological receptors. This takes into account mitigation measures such as screening berms, location of plant within pit void, and the use of water sprays to moisten surfaces during periods of dry weather. No increase in significance due to interaction.

Noise & Vibration

16.22 In relation to noise and vibration there is potential for interaction with human and ecological receptors, and this is addressed in Chapter 10 (Noise & Vibration).

Population: Noise emissions associated the removal of trees in addition to the extraction activities, have the potential to cause disturbance to human receptors. After an assessment of potential adverse effects produced by the development it was concluded that there would be no significant adverse noise effects for human receptors. This takes into account mitigation measures such as screening berms, maintenance of plant, location of plant on the pit floor. No increase in significance due to interaction.

Biodiversity: Given the distance between the site and the nearest designated ecological site, noise associated with the construction and operation is unlikely to have significant effects. Appropriate mitigation measures have been recommended to ensure the noise limits are not exceeded. No increase in significance due to interaction.

Material Assets

16.23 In relation Material Assets there is potential for interaction with Land, soil and geology, and this is addressed in Chapter 7 (Land, soil & Geology) and Chapter 15 (Material Assets).

Land, soil, geology: The interaction arises due to the removal of both the trees and the sand and gravel resource from the site. The site is recognised on the GSI Aggregate Potential Map as having high potential for "granular aggregate potential". Both materials would provide potential resources for the construction industry in County Kildare and wider region and therefore a potential benefit in terms of material assets. Once exhausted, the sand and gravel resource cannot be replenished, though it is proposed to import materials as part of the site restoration, the effect of the loss of the sand and gravel would not therefore be visible. It is proposed to replant the trees as part of the proposed restoration. No increase in significance due to interaction.

Landscape & Visual

16.24 The development has the potential to impact on population (human) amenity through changes to the landscape and views / prospects. The detailed landscape & visual assessment provided in Chapter 12 (Landscape) addresses this issue. A summary is provided below.

Population: The introduction of the development at this location has the potential to alter views from residential dwelling or to undermine the quality of a view from a recognised leisure spot. A series of viewpoints were prepared which assessed the development from this perspective. The assessment concluded that the development would be imperceptible from the majority of viewpoints, with two viewpoints (north of the site) noting a moderate change, which comprises the alteration of the profile of the ridge. The extraction area would not be visible from the majority of locations. No increase in significance due to interaction.

Traffic

16.25 In relation Traffic there is potential for interaction with Population and Human Health. This is addressed in Chapter 13 (Traffic). A summary is provided below.

Population: The increased traffic associated with the proposed development has the potential to result in increased waiting at junctions and congestion on routes. The traffic assessment and junction capacity analysis concluded that the routes and junctions would continue to operate within capacity for all assessed years and therefore the overall effect would be imperceptible. The development access has adequate sightlines and therefore no road safety issues should arise. No increase in significance due to interaction.

Cumulative Effects

16.26 This section of the EIAR describes the environmental effects of the Proposed Development in combination with other relevant committed development in the surrounding area of the Site.

16.27 As described above, the first step comprised the identification of a list of all developments within 5km of the application site.

16.28 The following developments (refer to Figure 16.1) were short-listed as having the potential to result in cumulative effects:

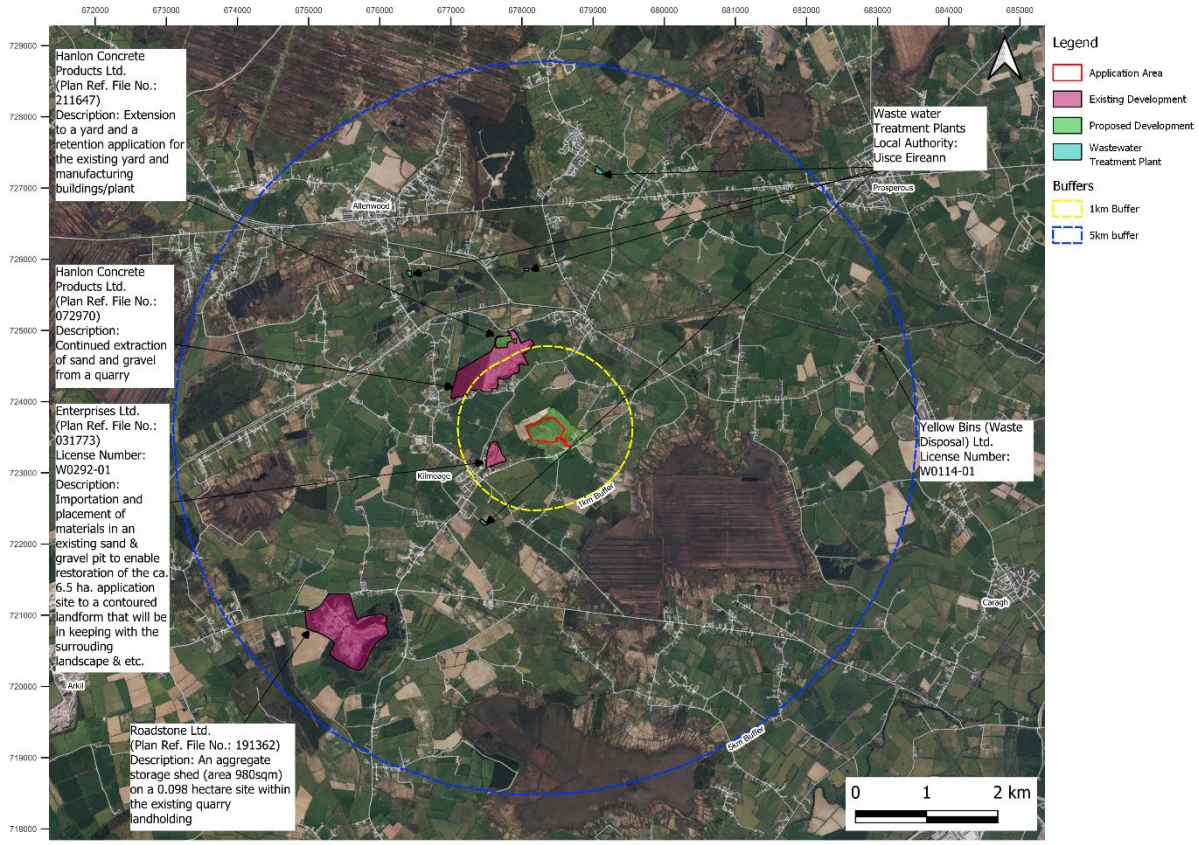
- Plan File Ref. No 23/60256 - for (i) Extension to the existing sand and gravel pit with an extraction area of 4.890 hectares; (ii) Use of the existing sand and gravel pit for processing, storage of processed and unprocessed aggregates over an area of 4.681 hectares; (iii) Provision of mobile screening plant (no washing of aggregates will take place on site) and installation of a wheelwash within the existing sand and gravel pit; (iv) Restoration of the existing sand and gravel pit and proposed extension area to agricultural use with a total area of 9.571 hectares; (v) and all other ancillary site development works and activities associated with the proposed development. The duration for which the planning permission is sought is ten (10) years. Planning permission was previously granted for the existing sand and gravel pit and proposed extension area under Reg. Ref. 05/2340 as approved by An Bord Pleanála PL09.218352 and an extension of duration was also approved by Kildare County Council under Reg. Ref. 15/125 – Planning permission for both the existing sand and gravel pit and proposed extension have expired as has the extension of duration. No works have taken place since planning permission expired. An Environmental Impact Assessment Report (EIAR) will be submitted to the planning authority with the application
- Plan File Ref. No. 23/60266 - 1. Quarry development and associated processing previously permitted under P. Reg. Ref. No. 99/2042 and ABP Ref. PL09.123207) to include drilling, blasting, crushing and screening of rock; and lateral extension to same, with an overall extraction area of c. 6.2 hectares with no vertical deepening below the existing quarry floor. The appropriate period of planning register reference 99/2042 was extended by order dated 03/02/2017 by P. Reg. Ref. No. 16/1246; 2. Importation of up to 35,000 tonnes per annum of processed fine aggregate, principally sand for use in readymix concrete production on site; 3. Use of buildings and structures associated with the sand and gravel pit previously granted planning permission under P. Reg. Ref. No. 03/2754 comprising of the crushing, washing and screening plant with associated silt disposal lagoons; readymix concrete batching plant including powerhouse; prefabricated office; weighbridge; workshop building with concrete laboratory and bunded fuel tanks; aggregate storage bays; and one liquid effluent treatment system unit; 4. Closure of the existing site entrance with provision of a new site entrance located to the north of the existing entrance; realignment of the main internal site access road from the new site entrance to the central processing area with provision of a new wheelwash system; acoustic fence screening (c.2m in height x 170m in length); and a new screening berm along the western site boundary; 5. Restoration of the site lands will be to a combination of beneficial agricultural and ecological after-uses; 6. All associated site works within an overall application area of c. 51.7 hectares. The proposed operational period is for 10 years plus 2 years to complete restoration (total duration sought 12 years); and 7. Provision is also made for 3 no. sections of road improvements (widening) along the haul route between the site entrance and the R148 regional road. The proposals at the identified locations

include for works in the public road and verge that aim to achieve a consistent carriageway width of 6.0m along with provision of verge widening on the inside of the three bends to improve forward visibility and intervisibility for all opposed traffic including traffic generated by the proposed development. An Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) have been prepared in respect of this planning application. Assessed as part of baseline as not new use.

- Plan File Ref. No. 23/60102 - Of the continued use of the existing sand and gravel quarry workings (permitted under PL. Ref. 07/1560, ABP Ref. PL 09.229696) including washing, crushing and screening plant, silt lagoons, overburden storage, screening berms and site infrastructure comprising site office (including welfare facilities), store, 2 no. concrete batching plants and block yard, wheelwash, service shed, bunded fuel storage and other ancillaries. It is also proposed to continue use of a concrete batching plant and ancillaries permitted under planning permission PL. Ref. 22/533. The total area (c. 31 ha) will be subject to progressive restoration with final restoration to agricultural/amenity use. An Environmental Impact Assessment Report (EIAR) will be submitted to the planning authority with the application – Assessed as part of baseline due to continued use not new use.
- Plan File Ref. No. 23/613 - (1) Extend the life of the existing sand and gravel pit development totalling c.23.2 hectares previously granted under planning permission 99/1200 (ABP PL09.118274) with processing that includes crushing, washing and screening, and 07/977 (ABP PL09.226718). The sand and gravel extraction will be dry working above the water table, (2) Extend the life of the proposed sand and gravel pit extension area totalling c. 30.9 hectares previously granted under planning permission 07/977 (ABP PL09.226718). The sand and gravel extraction area will be c.25.7 hectares and will consist of dry working above the water table; (3) Include for all associated services and ancillary works consisting of: (a) the existing processing plant for the purposes of crushing, washing and screening; (b) the existing office, toilet and associated waste water treatment system, canteen, weighbridge, wheelwash and site entrance; (c) the construction of new screening berms on the northern and western boundaries of the proposed extension area; (4) Restoration of most of the worked-out sand and gravel pit (c. 39.6 hectares) to its surrounding/former ground level using naturally occurring materials, principally inert soil and stone generated by construction and development activity and imported as waste under licence or as by-product (in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 (as amended). Restoration of the entire site to a combination of agricultural and nature conservation areas; (5) installation of a dedicated covered waste inspection and quarantine shed and for storage of plant and machinery (c.20M length x 12m width x 7.5m height); (6) The proposed development is within an overall application area of c. 54.1 hectares and is for a total period of 25 years (the sand and gravel extraction operational period is for 22 years and the importation of materials for restoration is for 25 years). An Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) have been prepared in respect of this planning application. Part of the proposed restoration element of the development will require a waste licence from the Environmental Protection Agency. (This site is located 18 km from the application site). Assessed as part of baseline due to continued use not new use.

- 211647 – For the extension to a yard and a retention application for the existing yard and manufacturing buildings/plant and all associated ancillary facilities within an existing quarry complex – approved 27/10/2022. Appealed PL09.315110.
- 201409 – Upgrading of entrance, installation of site facilities for extraction and processing of sand and gravel. An Environmental Impact Assessment Report (EIAR) has been prepared in respect of this planning application. Revised by Significant Further Information which consists of updates to the EIAR and revised plans. Appeal – PL09.311677. (This site is located 30 km from the application site). Assessed as part of baseline due to existing use.

Figure 16.1: Other Developments (medium – large scale) within 5 kilometres



16.29 This list was then narrowed down to include only those projects where there was potential for significant cumulative effects arising in combination with the proposed development.

16.30 Considering the small scale and temporary nature of the residential and rural developments there is no potential for the nearby small development to result in in-combination impacts with the proposed development.

16.31 The cumulative impact assessment of developments that are already constructed and operating, is already accounted for in the baseline conditions established for the main assessments within Chapters 4 to 15 of this ER.

16.32 The above planning applications predominately relate to developments that are all distant from the application site. If permitted these developments would result in the alteration of the existing land-use however, given the distance between the proposals, it is not anticipated

that any cumulative effects would occur as a result of the construction or operation of these developments.

16.33 Planning application 23613 relates to the extension to an existing sand and gravel pit, the operation of the proposed sand and gravel pit will require the removal of sand and gravel from the site which will be transported off-site and utilised for a range of purposes including as construction aggregates. This site is situated over 18km to the northwest of the application site. No significant adverse cumulative effect is therefore likely to occur.

16.34 Planning Application 211647 relates to a site that is situated 1.35km to the north-west of the application site. The proposal sought to enlarge an existing storage yard. It is therefore not anticipated that any cumulative effects would occur as a result of the construction or operation of these developments.

16.35 Planning Application 2360256, is situated over 35km from the application site, Planning Application 201409 relates to a site that is situated 30km and Planning Application 23/60266 is over 20km from the application site. It is therefore not anticipated that any cumulative effects would occur as a result of the construction or operation of these developments.

REFERENCES

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