

REPORT

Substitute Consent Application - ECT Sand and Gravel
Non-Technical Summary

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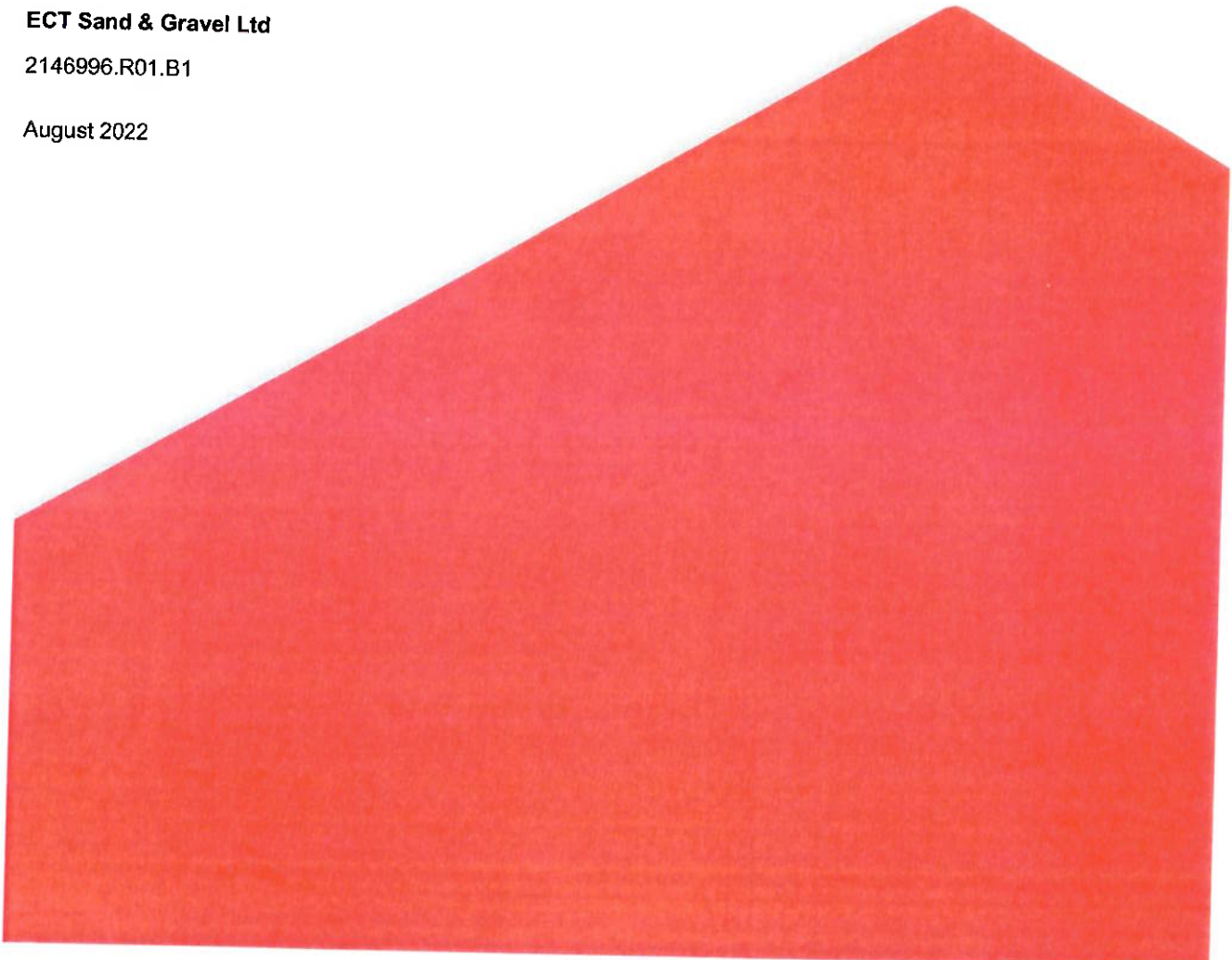
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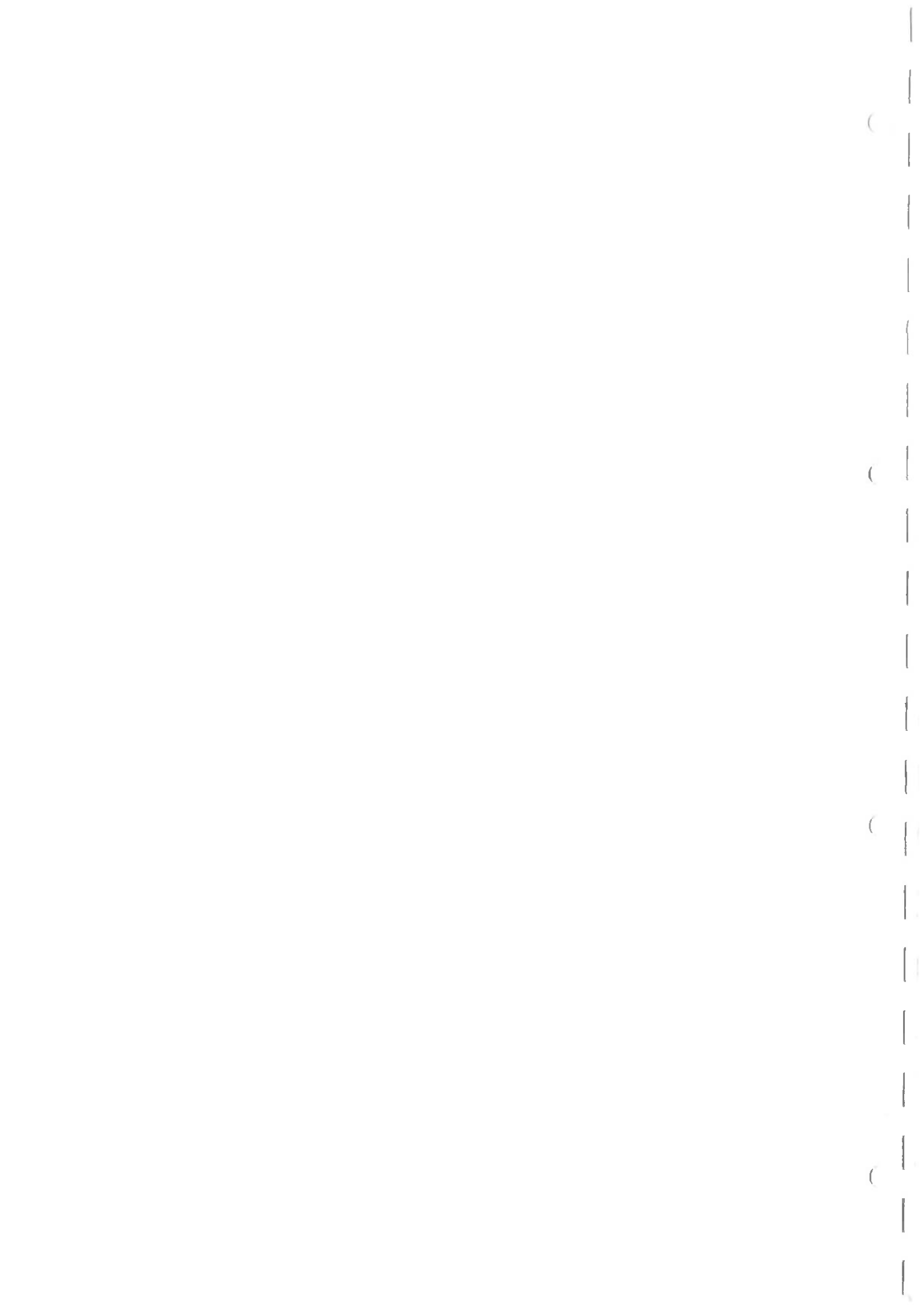
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NON-TECHNICAL SUMMARY

1.0 INTRODUCTION, SCOPE AND METHODOLOGY

Golder, member of WSP in Ireland (Golder) have been commissioned to undertake this Remedial Environmental Impact Assessment Report [rEIAR] to accompany a substitute consent application for an existing sand and gravel quarry at Ballinabarny North and Bolagh Lower, Redcross, Co. Wicklow. The rEIAR is submitted on instruction of ECT Sand and Gravel, owner and operator of this quarry who will be the applicant for this substitute consent application. Leave to apply for Substitute Consent was consented by way of Order of An Bord Pleanála [ABP-307472-20] of 9 July 2021.

The Remedial Environmental Impact Assessment Report [rEIAR] sets out the details of the technical assessments that have been carried out as part of the rEIA process and identifies the potential for significant environmental effects to have arisen as a result of the Development. This document provides a provides a summary of the key findings of the rEIA in non-technical language.

The quarry, the intended subject of an application for substitute consent is situated ca. 3.5 km southeast of Rathdrum, and ca. 3.5 km northwest of Redcross. The lands the subject of this rEIAR, comprises a substitute consent application area of 23.7 ha. The reserve at this quarry is glaciofluvial sands and gravels derived from sandstone and shales and is underlain by shales and siltstones. The sand and gravel deposits at the quarry are currently worked to an average depth of 114 mAOD which generally sits above the underlying shales and siltstones. The reserve is excavated by mechanical means and processed directly on site. Excavated material is transported to a processing plant area which sits over approximately 0.75 ha. that holds further processing plant the caters for washing, screening and grading of aggregates for market. This plant and processing area is an established part of the quarry area and is located central to the Site.



Figure 1: Location of the Development

1.1 EIA Context

EIA is a process undertaken for certain types of development. It provides a means of drawing together the findings from a systematic analysis of the likely significant environmental effects of a scheme to assist local planning authorities, statutory consultees and other key stakeholders in their understanding of the impacts arising from the development.

The requirement for the current rEIAR arises as a result of an Order by An Bord Pleanála that allowed a 'fresh' substitute consent application for a quarry reviewed under S.261A of the Planning and Development Act, 2000 as amended. The procedures and considerations for substitute consent are also contained in the Planning and Development Act, 2000 as amended. Therefore the planning and development statutes and related policy and guidance are relied upon to contextualise and define this rEIAR report.

The report of the assessment of environmental effects to be prepared and submitted by a developer is referred to as an Environmental Impact Assessment Report (EIAR) in the current planning and development statutes after the transposition of the 2014 EIA Directive. In this instance the development to which this report refers is that which has been already undertaken and thus this report is of experienced effects hence its definition as a remedial report (rEIAR).

The rEIAR has been prepared in line with relevant legislation and national and international guidance and the methodology followed by each of the technical environmental specialists is set out within Chapter 1 of this rEIAR.

S177F(1A) requires that the rEIAR be prepared by experts with the competence to ensure its completeness and quality. The chosen EIA project team are deemed "competent experts" and their credentials are set out in the chapter 1 of this rEIAR.

1.2 rEIAR methodology

The rEIA directly covers the physical extent of the Site. Also, as many predicted impacts can extend beyond the immediate Site boundary (for example the use of the Site for foraging by a species that is primarily located off-site) an appropriate 'zone of influence' has been considered, as described in the individual topic chapters. The geographical extent of the EIA boundary also includes the cumulative impacts from related and unrelated development activities in both the construction and operational phases.

The baseline for this rEIAR has been set to 1 February 1990 (the date that the original EIA Directive (85/337/EEC) was transposed into Irish Law) and the rEIA process will assess environmental impacts from that date to the present.

Prediction methods are required to identify and assess the significant effects of the development on the environment. The predictive methods used for each technical discipline are detailed in the respective chapter. For several topic areas, predictive methods have been developed by professional bodies. Where these are available, they have been identified in the individual chapters as appropriate.

For topics where there is no topic specific guidance available, a common framework of assessment criteria and terminology has been used based on the EPA's Guidelines on the Information to be Contained in EIARs (EPA, 2022).

This common framework follows a 'matrix approach' to environmental assessment, which is based on the characteristics of the impact (magnitude and nature) and the value (sensitivity) of the receptor. The terms used in the common framework are described below. Details of how these specifically relate to the individual topic areas are provided, where appropriate, within the respective topic chapters.

The approach to assigning significance of effect included reasoned argument, the professional judgement of competent experts and using effective consultation to ensure the advice and views of relevant stakeholders were taken into account.

Development of Subject Site from Baseline to Current Time

Section 3.6.1 of the 2022 EPA EIAR Guidance states that together with the description of the project “...the description of the baseline scenario is the second of the two factual foundations of the EIAR.”

In this instance the rEIAR presented relates to development already undertaken. For this reason the baseline scenario required to be described has passed.

In deference to S.261A and the requirement for Environmental Impact Assessment arising since the 1st February 1990 we have set the baseline of this rEIAR at that appointed day.

The reader is reminded that historic extraction of the subject lands was evidenced in previously submitted S.261 registration information. The applicant provided records of first extraction evidence on the lands in the 1940's.

In order to retrospectively build a narrative of the development of the subject lands over their extraction lifetime the EIA team have reviewed and primarily rely upon publicly available resources; historic mapping and photography; permitting and licensing histories; and historic monitoring records.

The Need for the Development and Consideration of Alternatives

The sand and gravel reserve at the Site is of a proven good quality capable of being used as aggregate fill and for further processing to asphalt and concrete based products. Therefore, the reserve material assumed to be present at the subject site and now extracted provided suitable aggregates for construction purposes.

As with all aggregate extraction development the nearer the supply of aggregate to the market, the more economically viable it is and given the nature of aggregate deposits, quarries can only be worked where the sediments occur. Aligned to this economic situation is the environmental and social preferability of locally sourced aggregates. Aggregates sourced close to their market are preferable to those sourced at more remote locations as this lessens road traffic and associated environmental impacts and economic costs. Socially, the local sourcing of construction aggregate strengthens the local economy through job provision and associated spending and exploits advantages and opportunities inherent in local supply chains.

Aggregates are an essential material for the construction industry and are used in all major development plans (housing, road surfacing, infrastructure etc.). As such, they are of major significance to the overall growth of their local areas and the country and an important economic resource despite fluctuations in levels of construction due to wider economic forces.

The purpose of rEIAR is to assess the site with regard to experienced / potential impacts on the environment, and to recount / propose measures to avoid, reduce or remedy undesirable potential impacts, as appropriate.

In this case, the quarry site represents the land asset upon which the owner and company employees rely. The owner is a quarry operator and employer who wishes to maintain this asset. The continued quarry use and sustainable further development is contingent on further planning permission to secure future reserve especially as the substitute consent process is restricted to extant development.

Maintaining the quarry site and adjacent suitable lands as a viable quarry with associated processing plants will ultimately realise the sustainable extraction potential of this extant, established quarry and will maintain those direct and indirect jobs.

Site Selection

In this instance the rEIAR has arisen as a direct requirement of an application for leave for substitute consent. In other words, the subject site is not a proposed site but rather an existing extraction and processing site. In view of the retrospective nature of the substitute consent process we cannot point to a site selection methodology employed in choosing the subject site. As such site selection is outside the control of the operator having originated from their purchase of the extant quarry land in 1999. The existence of the established quarry and processing complex suggests that the persistent, continuous use of the subject lands for a quarry was more feasible, in environmental and economic impact terms, than developing a new greenfield quarry.

Alternative Designs Considered at the Subject Site

In common with the site selection methodology alternative design proposals are precluded due to the retrospective nature of the rEIAR. A review of historic aerial photography and information supplied by the developer suggests that since the 1940s the subject lands were extracted from the east, with progression in a north, west and south direction, and it is known from the 2021 topological survey data that extraction is to approximately to an average depth of 114 mAOD where sand and gravel deposits have already been exhausted. It is assumed that the direction of extraction workings was dictated by the proximity of processing and direction of deposit. As such, the subject site now has an established form and layout and the only event conceived and contained within this rEIAR is the restoration of this area to have regard to EIA requirement for mitigation of foreseeable impacts.

2.0 PROJECT DESCRIPTION

The lands the subject of this rEIAR extend to approximately 23.7 ha. constituting the extent of the quarry landholding in the control of the applicant. The lands the subject of this rEIAR extend to 23.7 ha. that reflects historic operational site information including the extractable area of 4 ha. declared under S.261 quarry registration in 2005. The extracted quarry area that makes up the application for substitute consent planning unit currently extends to approximately 20.16 ha. at the centre of the EIA project area that is generally bounded by agricultural lands and forestry to a lesser extent.

The quarry Site comprises land that is currently used for quarrying activities, which include: excavation areas; haul roads; stockpiles; processing plant; administration, maintenance, storage and welfare facilities; and the lake formed from historical below water-table mineral extraction.

The quarry site is accessed off the L5155 and has been accessed from that road since the 1940's. The current quarry void is centrally located within the EIA unit and roughly square in shape at the southern boundary of the current quarry area is the existing administration and processing plant area is situated central to the Site over approximately 0.75 ha.

At baseline in 1990 the quarried area has been determined in the Land, Soils and Geology Section of this rEIAR to extended to 0.75 ha. And an average working depth of 124mOD and to have expanded laterally to 20.16 ha. with an average working depth of 114 mAOD to the north and northwest by 2022. The quarry levels at the south and west of the Site comprising the processing, stockpiling area and site administration area are currently at approximately 125mOD.

There has been an estimated total extraction of over ca. 1.5 million tons of aggregate from the lands over 32 years from 1990 to 2022 (inclusive). The volume of extraction from the sand and gravel pit during the period of the Development was on average around 50,000 tonnes per year.

Traffic

All traffic occurring within the quarry is internal traffic using internal short informal haul routes. No pedestrian access is permitted to the active extraction areas of the Site.

Once excavated aggregate leaves the quarry void, they are transported to the aggregate plant (via internal haul routes) by truck for processing: washing, and screening and temporary storage prior to being sold to the market. Internal traffic speeds are limited to less than 15 km/h.

Access to the sand and gravel pit is from the public road along an existing access road from the southeast. The junction between the site access road and the public road is appropriate for the flows that existed during the period of the quarry development.

Planning permission (Ref. 06/4577) was granted by Wicklow County Council for a new access road to the east of the Site and entrance to the sand and gravel pit in 2007. This access road is constructed but cannot be brought into use until such time as the quarry is authorised.

Hours of Operation

Reflecting normal practice and as declared on the S.261 registration form for the Site ref. QY39, operational hours for the Site are 07.30 to 17:30 hours Monday to Friday, and 07.30 to 14:00 hours Saturday. There is no working on Sundays or Bank/Public Holidays.

Employment

Direct and indirect employment is attributable to the rEIAR area since baseline. Employment levels vary in accordance with market demand and associated extraction and processing requirements. Direct employment is in the categories of plant operators, fitters, laboratory technicians and administrative staff. It is noted that, at times when peak demand existed, the work, including direct employees, sub-contractors, haulers, maintenance contractors, material suppliers etc., increased from time to time.

Fuel and Chemical Storage

Fuel storage is in double skinned and bunded fuel tanks located in the maintenance area. Refuelling occurs at these tanks over a concrete apron with spill mats in place. Oils, chemicals, and admixtures are ordered and used as needed, and used oil and chemical containers are separately stored within the maintenance area for disposal by licensed contractor.

Waste Management

The waste arising on-site is municipal waste from staff welfare activities and is disposed of via domestic waste collection. Similarly, scrap metal arising on-site is stored within a designated area at the Site prior to collection by a licensed waste contractor.

Waste is also generated from the maintenance and servicing of equipment, these include waste oils and lubricants and tyres, which are collected and managed appropriately by an authorised waste contractor. The Site generates limited quantities of light bulbs, batteries and scrap metals. These are disposed of as required by appropriately authorised contractors.

Waste-Water

A septic tank exists on-site to cater for full time site employees, contractors and additional visitors.

Potable, Surface and Groundwater

There is a well adjacent to the administration area, as indicated on the site layout drawings submitted with this application. Water from the well is used to provide potable water and to service on-site welfare facilities.

Water for the washing of aggregate is sourced from an on-site waterbody and is recycled through a closed-loop system via a series of silt ponds, which are periodically emptied. Once dried, the silt from the ponds is used in the restoration of the Site.

Power Supply and Telecommunications

Power is supplied to the Project Site via the electricity network. A 110KV power supply line enters the site overhead from the west, supplying the processing area where 3 phase power supply is required to run the washing and screening plant.

Safety and Security

The Project Site is required to comply with relevant legislation. In particular, the relevant Health and Safety legislation (Safety, Health and Welfare at Work Act, 2005, the Mines and Quarries Act, 1965) and subsequent Quarries Regulations relating to health and safety, training, appropriate site management etc. are complied with. Amongst these regulatory requirements are the need to keep on-site an up-to-date Health and Safety File, which records safe procedures, deviations from those procedures and accident reports.

Compliance with these requirements is assumed to have been contemporaneously complied with throughout the life of the operations to date. The operator maintains a Health and Safety File and facilitates site inspections by the Health and Safety Authority (HSA).

The Project Site is fully fenced, with any agricultural entrances permanently closed and locked. The only vehicular entrance in operation is that from the L5155, which is gated inside the edge of the carriageway to allow for safe onward travel of vehicles. All vehicles entering and exiting the Site must do so from the L5155 entrance, and travel along a dedicated private gravel covered access road to the administration/maintenance and aggregate processing areas.

Rehabilitation

This rEIA has been prepared for a substitute consent application for quarrying under S.261A of the Planning and Development Act, 2000 as amended. It is recognised that substitute consent applications cannot propose development that is not quarrying and are retrospective in nature. This rEIA contains a concept for a restoration plan in Chapter 11. The plan is conceptual only, and not for works to be undertaken having regard to the above limitation on the substitute consent application for further works. The rehabilitation plan provides for restoration of the Site in the event that no further quarrying is proposed at the Site.

Major Accidents and Disasters

The EIA Directive (Directive 2011/92/EU, as amended by Directive 2014/52/EU), requires that an assessment is made of 'the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned'.

The consideration of major accidents and disasters seeks to assess the relevant accidents and disasters which a Development is vulnerable to, and the relevant accidents and disasters that a Development could give rise to. These unforeseen and unplanned events are to be assessed on the risk of their occurrence, however in view of the retrospective nature of this rEIA the scope of this section is limited to a rudimentary review of previous operations at the Site.

Potential risks of major accidents and / or disasters which are inherent to quarrying operations include fire/explosion, unplanned outages or disruption to services, road traffic accidents resulting from Heavy Good Vehicle (HGV) movements, contamination of the groundwater/ surface water, flooding, and falling debris or the collapse of benches or quarry faces.

The consideration of potential risks of major accidents and disasters adopted the assessment criteria of the Department of Environment, Heritage and Local Government's 2010 national guidance document, 'Guidance Document 1, A Guide to Risk Assessment in Major Emergency Management'.

Extraction activities at the Site during the assessment period have been managed to ensure that the risk and vulnerability of the Site and the surrounding infrastructure to major accidents and disaster has been minimised.

During the assessment period of 1990 to the present day, activities at the Site have not resulted in accidents or disasters that are deemed to be 'Major', therefore there has been an imperceptible effect (including no effect) of the Site activities on the surrounding environment in regard to major accidents and disasters.

3.0 POPULATION AND HUMAN HEALTH

The population and human health chapter of the remedial Environmental Impact Assessment Report (rEIAR) presents a retrospective assessment of the potential effects that may have occurred, and may continue to occur, on the surrounding human environment, as a result of activities at the Site between 1990 and the present day. It also records remedial mitigation measures undertaken or proposed to be undertaken.

Effects of a development on the environment can impinge upon the surrounding human environment, directly and indirectly, positively and negatively. Direct effects may include such matters as safety, air and water quality, noise, landscape quality and road traffic. Indirect effects pertain to such matters as ecology and biodiversity, heritage and archaeology. These matters form discreet sections of this rEIAR in their own right and corresponding mitigation measures are comprehensively provided in those sections.

Having regard to the 'Guidelines on the information to be contained in environmental impact assessment reports' published by the EPA in May 2022; the characteristics and context of the lands that are the subject of this rEIAR; and the retrospective nature of the development, this rEIAR chapter aims to identify the likely significant impacts that the development has and may have had on the 'quality of life' and are discussed under the following headings:

- Populations;
- Employment;
- Amenity;
- Land Use and Development Patterns;
- Human Health; and
- Health and Safety.

Impact Assessment/Potential Effects and Mitigation

Population

Potential impacts from the Site which may have affected local populations during the assessment period include nuisance from noise, vibration, dusts, landscape and visuals impacts, and impacts to groundwater. The potential extent of these will be limited to the local community surrounding the Site. However, the sensitivity of the local population is high.

Based on the assessment of environmental impacts in other chapters of the rEIAR (in the respective rEIAR chapters of: Soils and Geology [Chapter 5], Water [Chapter 6], Air Quality and Climate [Chapter 7], Noise and

Vibration [Chapter 8]; and Landscape and Visual [Chapter 10]) it is considered that the magnitude of impact on the population dynamics of the local community has been **low and adverse**.

Employment levels at the Site have increased during the assessment period, however the potential direct impact on local population growth due to workers migrating to the area was **slight**.

Employment

Through the assessment period the Site has provided consistent employment for staff and during years of economic prosperity and this figure increased in line with strategic demand. Currently the Site continues to support approximately 8 employees direct and 25 indirect, including direct, staff, contractors and truck drivers. There is also indirect employment in the supply chain to provide material, specialist labour and services for the workforce. In conclusion, given the size, nature and duration of the Site during the assessment period, and the creation of long-term employment in the surrounding area. The Site is considered to have a **low and beneficial** impact on employment.

Given the distance from the Site and the nature of the one local business within the surrounding study area, it is considered that this business could continue to operate without substantial harm if affected by a disruption, thereby classifying them with a 'Low' environmental sensitivity value. During the assessment period it is considered that the magnitude of impact from the Site on this local business is negligible, leading to an overall impact of **imperceptible** significance.

The area is designated for rural development under its land use zoning objective. One agricultural land holding that operates as a rural enterprise has been identified within the study area. The main potential impact is likely to be from noise, vibration and dust and potential disruption of field drainage systems. It is considered that these practices have a low sensitivity and are of a nature which could continue to operate without substantial harmed if affected by disruption from the Development. The Site has not created permanent changes to the spatial relationship of rural enterprises to any key infrastructure which could have result in damage to the enterprises and compromised its viability, therefore it is considered that the Development has had an impact of **imperceptible** significance during the assessment period of 1990 to 2022.

Amenity

As noted, factors such as air quality, noise nuisance, vibration, traffic and landscape and visual impacts can impact the amenity of an area. These issues have been assessed separately in the respective chapters of this rEiAR. Area of amenity (which include local designated green space / community facilities) are considered valuable to the local communities and have been valued with a high environmental sensitivity. Given the distance of the amenity areas from the Site it is considered that they would have perceived a negligible and adverse magnitude of impact during the assessment period resulting in the **slight** significance of impact.

Land Use and Development Patterns

Quarrying activities at the Site have gradually increased in the subsequent years since the quarry was first developed in the ca. 1940. With respect to social considerations, there has been little or no change to local activities in the vicinity of the Site during the assessment period as a result of quarrying activities, with the mainstay of local activities being agriculturally based. It is important to acknowledge that aggregate resources can only be worked where they naturally occur.

The loss of ca. 19.42 ha of agricultural lands to quarry development represents less than ca. 0.019% of the Utilised Agricultural Area (UAA) in Wicklow, this figure may be further reduced considering the Site land is classed as a Mineral Extraction Site by Corine Landcover. Given the size of lands exploited for extraction during the period of 1990 to 2022 and the wide availability of such lands in the locality would suggest low sensitivity and it is considered that the magnitude of this impact would be negligible, affecting a small number of rural

enterprises and would have little damage to these enterprises. The significance of impact has been classified as **imperceptible**.

Given the land use development objectives of succeeding Development Plans, and the extent and location of the Development, it is considered that these lands have a low sensitivity. It is considered that the magnitude of impact is low, leading to an assessment of **slight (adverse)** significance of impact.

Human Health, and Health and Safety

Discharges to ground resulting from site activities can impact the underlying groundwater and soils environment and could have potential to impact on human health by introducing contamination to the environment. It is considered that there has been no significant risk of water related impacts from the Site on surrounding human health.

Potential impacts to human health with regards to air quality include dust generating activities on the Site. Other impacts include increased concentrations of airborne particles and combustion emissions due to exhaust emissions from diesel powered vehicles/equipment used on-site and other vehicles accessing the Site. The assessment of traffic impacts predicted that vehicle movements associated with the historical operation of the Site has had a **negligible** impact on air quality concentrations.

Impacts to human health from excess noise and vibration on-site may result in; hearing loss and various vibration syndromes of workers from high level occupational exposure. Off-site impacts include the nuisance and effects on mental health in the surrounding residential receptors. Noise monitoring indicated that operational noise from the quarry and the nearby recycling plant are not having a significant noise impact in the wider area. The quarry noise at the nearest residential properties was and is significantly below the 55 dB(A) noise limit that applies to the quarry. It is concluded that operations during the Substitute Consent period at the Site, have not resulted, and are not resulting or unlikely to result in any a significant noise impact at the nearest residential properties.

The Site has confirmed that there have been no serious injuries or fatalities to employees, contractors or third-parties/members of the public during the assessment period of 1990 to present. These staff and local populations are both valued with a 'High' sensitivity receptors. Based on the assessment of impacts and embedded management measures employed at the Site it is considered that the operations have had potential for a negligible direct or indirect magnitude of impact on health and safety, with potential for an impact of **slight** significance.

No remedial measures or specific monitoring other than those detailed in the other chapters of the rEIAR are identified.

The assessment concludes that the existing development did not and does not give rise to significant adverse effects on human environment surrounding the Site during the assessment period of 1990 to 2022. In all cases the residual effect is no greater than **slight** and therefore overall, not significant.

As there were no other relevant plans or projects in the 500 m of the Site during the assessment period of 1990 to present, it is considered that in-combination effects as a result of the historical works with regard to other plans or projects is not significant.

4.0 ECOLOGY AND BIODIVERSITY

The focus of this assessment, wherever possible, is centred on the establishment of likely baseline ecological conditions (flora, fauna and habitat composition) between 1990 and Spring 2022. This focus enables likely effects attributed to land take, disturbance and habitat loss and transition to be assessed and impacts identified

as appropriate. Historical mapping, anecdotal evidence and habitat assessment of neighbouring lands have all been used to predict the Site conditions between 1990 and Spring 2022. Ecological walkover surveys were carried out on the 9th and 10th February 2022. In any retrospective assessment uncertainty may be a feature. As such, a conservative approach has been adopted to recognise impacts and the remedial mitigation strategy presented is also weighted in favour of a conservative scenario of mitigation hierarchy adoption.

The evaluation of ecological features (sites, habitats and species) which could be affected by the operational Project between 1990 and 2022 includes:

- Any statutory designated areas, with the exception of Natura 2000 sites, which are situated within 5 km of the project site that have potential ecological connection(s) with the Site;
- Any surface or groundwater bodies that have hydrological connectivity with the Site;
- Any habitat type recorded within the Site; and
- Any species of conservation importance which has been confirmed as occurring / has potential to occur within the Site.

Impact Assessment and Mitigation Measures

A remedial stage 1 screening for Appropriate Assessment has been prepared for this Project which evaluates the potential for significant retrospective effects on the integrity of Natura 2000 sites. A total of eleven SAC and SPA were recorded within the search area and those that may be ecologically relevant. Given that no element of the Substitute Consent development was undertaken within or directly adjacent to any Natura 2000 site, there was no potential for direct effects on the qualifying interests of any designated site as a consequence of the development.

The habitat assessment provides a likely baseline scenario from 1990 at the Site. No Annex I habitats listed under the EU Habitats Directive are present within the Site and the dominant habitats present are of low ecological value. All species recorded during the botanical survey are considered common for these habitat types. Losses of habitat are certain to have occurred. It has been calculated that the footprint expansion of the Site between 1990 and 2020 amounts to ca. 17 ha. This loss is representative of grassland habitat with some hedgerow and scrub loss also certain.

Given the nature of the assessment, the operational impacts alone during the period between 1990 and 2022 are assessed. Operational impacts are summarised below:

- Land take (permanent loss) ca. 17 ha;
- Habitat modification through anthropogenic effects;
 - Disturbance to habitats and species through noise from traffic and mechanical excavation works;
 - Individual species disturbance / mortality; and
 - Impacts of dust as a result of extraction activities.
- Potential direct and indirect impacts from water quality and quantity are as follows:
 - Impacts of dust and Site runoff (sediments, fuel, etc.) as a result of quarrying activities; and
 - Impacts on groundwater from site de-watering (drawdown) and usage.

Permanent loss and damage to hedgerows or modification would afford a negative impact. In the absence of mitigation, this may restrict this availability and resource to fauna during the operational assessment timeframe.

The unmitigated effect of this development would result in a **Moderate** negative impact on habitat of local (lower) sensitivity and importance.

The potential for ecological impacts to bats from potential loss of foraging and roosting habitat and increased noise, lighting and human activity along commuting routes and within foraging habitats on the Site periphery has been assessed. The unmitigated impact of this development would result in **minor negative** effects to species of **Local (higher)** importance. These effects are likely to be local issues only; or small magnitude impacts at the regional and national level, they are usually temporary, and are unlikely to be of importance in the decision-making process. However, they are of relevance in enhancing the subsequent design of the restoration and consideration of mitigation measures.

The potential for ecological impact to the breeding bird group, in the absence of mitigation focuses on the loss of nesting habitat, operational noise (mechanical excavation and vehicle movements), dust deposition and subsequent changes in habitat composition (changes to structural, foraging, breeding and commuting habitat), and potential effects to bird species include a negative biophysical effect to vegetation availability which may disturb breeding birds and reduce available forage. The unmitigated impact on this feature would result in a **minor** effect to species of **site** importance. The majority of bird species are protected under the Wildlife Acts (1976-2012) where it is an offence to hunt, interfere with or destroy their breeding or resting places unless authority is obtained via statutory licence provision. Expansion of the quarry may have also had a positive effect on species such as Sand Martin as the increase in quarry footprint will have resulted in an increase in nesting opportunities (sand stockpiles) within the Site via quarry expansion between 1990 and 2022.

The potential for ecological impact to the mammal group focuses on the losses of hedgerow, scrub, grassland and tree habitat, operational noise disturbance, and dust deposition and subsequent changes in habitat composition (changes to structural, foraging and commuting habitat). The mammal group includes badger, fox, rabbit, stoat, pygmy shrew, and hedgehog. Although this group of species are generally mobile, operational impacts attributed to noise, vegetation removal and dust deposition must be considered. Dust that settles on plants, can affect the plants' transpiration, respiration and other metabolic activity, by clogging pores and damaging waxy cuticles on the leaves, and by reducing available light. Dust can alter soil and water chemistry, structure and trophic status which may have impacts on the composition of plant and invertebrate communities. Dust can have direct impacts on insect and other invertebrate populations. Impacts on plant and invertebrate communities may result in effects further up the food chain (small mammals). The unmitigated effect to this group would result in **minor** impacts to species of **Local (higher)** importance. Small mammals such as stoat and hare are protected under the Wildlife Acts (1976-2010).

Regarding hydrocarbons/chemical safeguards and protection of site water, the proposed remedial mitigation measures in the rEiAR are already implemented at the existing quarry Site.

To protect retained hedgerows and trees, such vegetation will be protected with secure fencing prior to the commencement of extractive works on Site. This protection will be designed following NRA guidance, in particular, with regard to root protection areas and fencing specifications (unless otherwise advised by a suitably qualified arboriculturalist). Dust suppression will be implemented in accordance with industry best practice guidance.

Planting will be required to mitigate for tree and hedge removal that occurred post 1990 and the concept restoration plan will be required to replace any trees and shrub species removed on a "like for like" basis (as a minimum). Consideration will be given towards hawthorn, blackthorn mix with individual alder and birch (to form native tree hedges) and deciduous trees (native tree species include oak, alder, birch).

Measures will be implemented throughout Site works to safeguard against the spread of any invasive non-native species (such as cotoneaster, Japanese knotweed or rhododendron). Indeed, where possible such plants will

be removed from the Site (and disposed of appropriately, following an appropriate method statement). As such, an invasive species survey will be undertaken within the appropriate window for this type of work which is likely to be within the growing season (April to September inclusive).

The concept restoration plan for the Site offers opportunities for habitat enhancement over and above the existing situation. Such enhancement measures will be detailed in a formal concept restoration plan and will be drafted in line with the following principles regarding enhancement measures for habitats and for fauna.

New habitat provision under the concept restoration plan will include provisions for trees, hedgerow, and shrub planting over and above the current situation. Where possible, these will be planted in association with other habitats of elevated value, such as wildflower grassland. Planting should comprise native species of local provenance. Where this is not possible, plants will be selected for their fruit, berry, or nectar bearing qualities. All landscape planting within the site will be managed for the benefit of wildlife.

To increase opportunities for roosting bats and nesting birds, a number of bat and bird boxes will be incorporated in the concept restoration plan for the Site, placed on trees of a suitable size. In addition, to increase opportunities for invertebrates within the Site, invertebrate boxes will be provided under the concept restoration plan. These boxes will be located in sheltered areas of new and retained vegetation, such as in association with hedgerows.

Residual Effects

For the purposes of robust assessment, residual effects have been considered to be effects that were identified in the impact assessment process prior to the consideration of any additional mitigation, as full details of some of the additional mitigation are yet to be developed. These effects were all identified as being not significant to minor afforded to species of Site and Local (higher and lower) importance in the period 1990 to 2022. In essence, the favourable conservation status of species and habitats on Site between 1990 and 2022 has not been adversely compromised. The on-going operation of the quarry committed delivery of mitigation measures and eventual restoration of the quarry is likely to result in all effects being considered to be not significant. In essence, this can be described as having no perceivable impacts on ecological features (habitat or species). Impacts may be beneath levels of perception, within normal bounds of variation. Depending on the efficacy of the restoration proposals at eventual closure of the Site, there may be an opportunity to provide a minor positive (net gain) for biodiversity value at the Site level.

Cumulative Impacts

Golder have reviewed the planning portal websites and Wicklow County Development Plan in addition to being involved in projects where EIAR is required within Wicklow County and the broader region. It is noted that there are no extractive or sizable industries in the surrounds of the Site which may contribute to cumulative effects in a retrospective context. It is therefore considered that no significant cumulative impacts have occurred.

5.0 LAND, SOILS AND GEOLOGY

The technical scope of this assessment is to consider the potential impacts and effects on soils, land and geology that could have resulted as a consequence of the quarrying related activities that have been carried out at the Site from February 1990 to May 2020. The assessment considers the potential sources of change resulting from Development activities. Due to the nature of the rEIAR and Substitute Consent process, a 'Do Nothing Scenario' has not been considered.

The loss of agricultural soils is considered, as will the potential impact on geologically important sites and land quality. Associated secondary potential impacts from changes to land quality on human health are also

considered. It should be noted that this assessment does not, however, constitute a contaminated land risk assessment, a geotechnical/geohazard risk assessment, or detailed quantitative human health risk assessment.

The main receptors identified that required to be assessed were land (soil/sub-soils, superficial deposits, and bedrock) at and immediately adjacent to the Development and human health at the Site and within the study area, that could be secondarily affected by changes to soils/sub-soils.

The soils mapped in the area include Clonroche (a fine loamy drift with siliceous stones described as well draining) and river alluvium. Using a worst-case scenario of 1 m of soil being stripped over this time, ca. 194,100 m³ of soils will have been removed. The soil has been placed in stockpiles in other parts of the for future use in restoration activities.

Superficial deposits mapped in the wider Study Area comprise a patchwork of glaciofluvial sand and gravels, undifferentiated alluvium and clayey till, with lacustrine (lake) sediments in the southwest of the Study Area. Till is the dominant superficial deposit within the 500 m buffer zone around the Site.

The Site is underlain by the Ordovician Kilmacrea Formation, which is described as comprising buff-weathering grey and black slates and shales. Occasional pale grey sandstones and tuffs may occur within this formation.

The Geological Survey Ireland's landslide susceptibility classification layer indicates that the Site has a low (or low-inferred) classification. In the wider Study Area, the classification is low or moderately low. No previous landslides events are mapped

The Radon Map for Ireland (EPA, 2022) indicates that the Site and Study Area are located in a High Radon Area and this is unlikely to have differed since 1990.

There are no sites designated for their geology or geological heritage sites located on Site or within the wider Study Area.

Impact Assessment and Mitigation Measures

The Section outline elements of the Project Description and the operational processes that were followed at the Site are considered to provide some historical and current mitigation of the potential impacts on land, soils and/or geology.

The main potential impacts and associated effects that are considered in the assessment relate to the following:

1. Activities or events that might have impacted land quality and associated human health (e.g. leaks and spills from machinery or stored substances, or discharges);

There is no land quality data available, so water quality during the assessment period has been used as a proxy to determine if land is likely to have been contaminated. The water quality data indicates that groundwater and surface water quality has been generally good. There is evidence of elevated concentrations of hydrocarbons in the water environment the early 2008 (not repeated in subsequent years) and evidence of potential input to the water environment from the septic tank, which discharges to ground, so the discharge may also have led to a change in land quality around the discharge location. The land around the septic tank discharge point is unlikely to be handled directly by workers, so the potential impact on human health is considered to have been **negligible (adverse)**.

2. Change of land use/land take (i.e. loss of agricultural lands);

There has been a loss of agricultural land as a result of the quarry expansion between 1990 and the present. The land use surrounding the quarry remains dominated by agriculture (tillage and pasture). The loss of 19.41 ha of agricultural land to development since 1990 is unlikely to be perceptible within the surrounding rural area

that is dominated by the same land use. Therefore, the potential impact on agricultural land is considered to have been **low (adverse)**.

3. Loss of soils and superficial deposits;

The nature of the Development involves the removal of sands and gravels from the superficial deposits for processing and sale, which will result in permanent loss from the Site. It also involves the removal and storage of overburden that comprises stripped soils and superficial deposits unsuitable for processing. The impact on these can be considered temporary in nature, as they will be stored for reuse as a fundamental part of the Site's restoration. The potential magnitude of the impacts on superficial deposits is considered to be **low (adverse)**.

4. Sterilisation of the underlying geological resource; and

Quarrying activities have been focussed on the superficial sands and gravels; therefore, that geological resource has been being exploited and is not sterilised. There was been no known intention to excavate bedrock at the Site. The quarry is relatively small and the bedrock geology is ubiquitous in the area; therefore, there would have been other areas where the aggregate potential could have been investigated and exploited, if required. Therefore, the potential impact of the sterilisation of bedrock geological resources is considered to have been **negligible (adverse)**.

5. Destabilisation and/or subsidence of unconsolidated material in stockpiles or on worked faces.

Stockpiles dimensions and locations are managed, and berms were used to provide catch protection, where required. The stability of excavations and stockpiles is considered to have had a **negligible (adverse)** potential impact on humans.

All effects considered have a significance of 'slight' or less, which are not considered to be 'significant' for the purposes of this assessment. Therefore, no remedial mitigation measures to reduce the effect significance further are defined and no further assessment of residual effects has been undertaken.

The ongoing monitoring programme at the Site provided regular stability checks of the quarry faces.

Throughout the assessment period quarrying activities have taken place approximately 2.5 km to the north-west of the Site at Balleese Wood Quarry. This quarry is on a similar scale to the Site and has carried out similar extractive and ancillary processes, so has been considered in relation to potential cumulative impacts during this period. Given the distances between the developments, and their relative size compared to the area of agricultural land available in the region, it is considered that there will have been no significant cumulative effects of their activities on the surrounding environment in terms of land, soils and geology.

6.0 WATER

The technical scope of this assessment is to consider the potential impacts and effects that changes in activities at the Site may have had on the water environment throughout the review period (1990-2022). The assessment considers the potential sources of change resulting from varying activities at the Site on hydrological (surface water) and hydrogeological (groundwater) receptors. It considers water levels, flow regimes, water resources and uses, water quality, flood risk and water management.

Hydrogeological Conceptual Model

Water enters the Site through direct rainfall precipitation and via the movement of groundwater through the subsurface which predominantly flows from southeast to northwest, coincident with local topography. Local surface water features are predominantly fed by rainfall runoff from higher topographical areas which collect in natural gullies and form headwaters for tributaries to larger streams and rivers. The topography of the Site and

the surrounding area means that surface water runoff from the Site (e.g. in the event of flooding from the Site) could discharge into the Newbawn stream (located along the east and northern site boundary) and eventually the Avonmore river (although significant attenuation capacity is noted within the existing excavated area).

Open water is present in the deepest excavated area of the Site in the north-west. This waterbody (and groundwater) is noted to be at a lower elevation than the adjacent Newbawn stream which passes along the eastern and northern site boundaries. The lowest elevation areas of the Site also intersects the groundwater table and therefore the ponded water is considered to be a mix of groundwater, potential recharge from the Newbawn stream and rainfall. Once present in the quarried area this water mass will be subject to evaporation and will provide some recharge to the underlying bedrock. Rainfall on other areas of the Site will either runoff towards the northwest waterbody or infiltrate the ground, where it will be subject to evapotranspiration or become groundwater. The stripping and/or removal of unsaturated ground will have lowered the ability of the Site to accept recharge to ground in excavated areas.

Groundwater within the sand and gravel deposits is not considered to be an aquifer due to the limited lateral extent and thickness of the deposits. Any groundwater within the sand and gravel deposits are unlikely to be in direct hydraulic connectivity with the Newbawn stream, although may receive recharge from the Newbawn stream via the unsaturated zone. Groundwater flow within the sand and gravel deposits will be intergranular and reduced in clayey areas.

Flow in the bedrock is likely to be predominantly confined to bedding planes, faults and fractures due to the nature of the bedrock. No faults are reported to cross the Site. Connectivity of fracture sets within the bedrock is expected to be low, with limited lateral connectivity (few hundred of meters from the Site) and decreasing hydraulic conductivity with depth as weathering of the rock reduces (rapidly reducing after 30 m depth). There may be zones of increased hydraulic conductivity in the unexcavated upper weathered zones which can allow for rapid infiltration of rainwater.

Under baseline conditions, groundwater within the sand and gravel deposits and shallow fractured bedrock likely received some recharge from the stream. The amount of recharge to groundwater will be limited by the potential of the deposits and bedrock to receive recharge. Whilst flows rates within the Newbawn stream are not well defined, it is noted that any impact due to dewatering on flows downgradient of the Site may be offset due to Site discharges to the stream via the settlement ponds. The catchment of the Newbawn upstream of the Site is noted to be small, with the headwaters located close to the eastern boundary of the Site.

The local catchment area for both surface water and groundwater are likely bounded upgradient by the topographic divide in the vicinity of Kilmacrea / Oakwood and downgradient by extent of the bedrock which is connected to the Site via fractures (likely small, maximum hundreds of metres distance). Groundwater at the site is not interpreted to be in direct (subterranean) hydraulic connectivity with the Avonmore River due to the distance of the waterbody (several kilometres from the Site). However, as part of the water management on the Site, water abstracted from the northwest waterbody is periodically discharged to the Newbawn stream following periods of prolonged rainfall, via settlement ponds. This offers a potential pathway for contamination, although surface water quality monitoring to date has generally observed good quality water and best practice measures relating to hydrocarbons are employed at the Site.

Impact Assessment and Mitigation Measures

Four main sensitive receptors were identified in the impact assessment for the Site: groundwater (quality and level), surface water (quality and level), on-site human health (drinking water supply) and flooding associated with discharge to the Newbawn stream. These are classified as being of low, medium, low and low sensitivity respectively.

No pathway was identified between the Site and Natura 2000 designated sites as these are located at distances exceeding 3.5 km from the Site and not in hydraulic connectivity with the Site. Equally, there is no pathway between the Site and off-site human health receptors (e.g. residential receptors).

During the construction and operational phases, the Development could have introduced a range of sources that on their own or in combination have the potential to impact water quality or availability. Known design and construction management mitigation measures were accounted for in an assessment of initial impacts and effects. Where additional mitigation measures were proposed to reduce the initial impacts and effects further, these were identified and included in an assessment of residual impacts and effects.

Mitigation through embedded design and remedial measures determines that the existing Development has not given rise to significant adverse effects on the water environment at or surrounding the Site during the review period of 1990 to 2021. In most cases the residual adverse effect is **not significant** and not greater than slight. However, the effects on the Newbawn stream have the potential to be moderate, which whilst still not significant, warrants a further confirmatory assessment of flow rates within the stream and monthly measurements are scheduled for June 2022 to May 2023.

7.0 AIR QUALITY AND CLIMATE

This chapter presents an assessment of the potential air quality and climate effects associated with the historic operation of the Site. The effects have been assessed in the context of relevant national, regional and local air quality policies.

A qualitative assessment of dust impacts from the quarrying activities has been undertaken in line with Institute of Air Quality Management (IAQM) guidance¹. A traffic screening for effects from road traffic emissions has been undertaken in accordance with the Environmental Protection UK/Institute of Air Quality Management guidance². For full consideration of the effects of the access road, in the absence of any methodology within the IAQM minerals guidance, the IAQM Guidance on the Assessment of Dust from Demolition and Construction (2016) has been considered.

Impact Assessment and Mitigation Measures

The main potential impact on ambient air quality associated with extraction and processing activities is that associated with deposition of dust generated by the material extraction and transfer operations including earthmoving and excavation operations; transport, loading and unloading of materials; temporary stockpiling of materials; haulage; and, wind blow from material stockpiles, unsurfaced internal haul roads and the quarry floor.

The historical daily traffic movements associated with the operation of the Site are approximately 40 HDV (trucks >3.5 tonnes) movements and 16 LDV (cars associated with staff/visitors) movements per day, with the Site operating 6 days a week (Monday to Saturday only). Considering that the traffic flows associated with the historic operation of the Site falls below the EPUK/IAQM screening criteria, no detailed assessment is required and therefore traffic emissions have been screened out of this assessment as **Not Significant**.

Inert natural materials have historically been excavated from the Site, which are not odorous. Therefore, odour is not considered any further in this assessment and is screened out as **Not Significant**.

Historical and current receptors identified for the purpose of the assessment of particulates/ dust emissions previous operation of the quarry include residential and non-residential receptors within 500m of the planning application boundary. Dust monitoring has been undertaken over a six-month period from October 2021 to April

¹ Institute of Air Quality Management (IAQM), Guidance on the Assessment of Mineral Dust Impacts for Planning, 2016

² Environmental Protection UK/Institute of Air Quality Management (EPUK/IAQM), Land –Use Planning & Development Control: Planning for Air Quality, 2017.

2022. EPA do not operate background air quality monitoring within Ballinabarney or the immediate surrounds and the site is located within a rural area classified as air quality zone D.

Dust impacts from coarse particulates during the construction phase (i.e. initial stripping of overburden) may have had the potential to have been greater than those experienced during the operation phase. This is due to the nature of the materials, as soils contain finer particulates than rock and therefore can be carried further in the air. With the application of the site-specific mitigation measures, it is therefore considered that the residual effects associated with the operation of the Site since 1990 have been **Not Significant**. The impact from fine particulates from the Site is considered to be **Negligible to Slight** prior to mitigation which would reduce to **Negligible** due to the mitigation measures employed historically by the Site.

The Development is not considered to be of a sufficient scale to have had the potential to impact the regional or local climate in any significant manner. In addition, the operation of plant and traffic movements at the Site are estimated to have generated less than 0.75 kt CO₂e per annum, equaling approximately 24 kt CO₂e over the 32-year assessment period. The Site has not had any significant effects on local prevailing weather conditions, nor has the Development increased the potential of flooding in the surrounding area. Therefore, the historical impacts on climate and climate change are considered to be **Not Significant**.

There are no other identified operations in close proximity to the Site which may have generated significant emissions to air. Therefore, there have been no opportunities for significant cumulative impacts to arise as a result of the activities at the Site since 1990.

8.0 NOISE AND VIBRATION

The Noise and Vibration Impact Assessment has considered all the winning and working of minerals, processing and associated transportation activities which have occurred within the applicant's lands during the period from the baseline (1990) to the current time (2022). This has included an assessment of all operational noise sources that have operated during typical opening hours of the existing sand and gravel quarry. The assessment has included operational noise surveys and noise prediction modelling to determine the noise impact that has occurred due to the existing sand and gravel quarry.

The noise and vibration impact assessment has been undertaken with regard to established standards and guidelines prepared by the Department of the Environment, Heritage and Local Government and the Environmental Protection Agency.

Impact Assessment and Mitigation Measures

A CadnaA noise prediction model has been prepared to predict and assess a worst-case noise level that has occurred due to the specific operation of the quarry. Seventeen noise sensitive receiver locations were included in the noise prediction model. The operational noise sources that have operated within the applicant's lands during the period from the baseline (1990) to the current time (2022) have been assessed to determine if the relevant Emission Limit Values (ELV) have been complied with or exceeded at the nearest noise-sensitive receptors. Compliance with the relevant ELVs suggests that the impact of operational noise sources that have operated within the applicant's lands during the period from the baseline (1990) to the current time (2022) have been 'not significant'. The highest predicted daytime noise levels indicates that the quarrying noise sources did not have a significant noise impact at properties in proximity to the site relative to the quarry noise limits during daytime.

Noise monitoring was undertaken on the 10th March 2022 and from the results it has been determined that the quarry noise received at the nearest residential properties was and is significantly below the 55 dB(A) noise limit

that applies to the quarry. Therefore, the specific quarry noise levels did not exceed the absolute limit that is applied to all extractive sites taken from the guidelines.

The measured daytime noise levels indicate that the cumulative noise from the Site and the occasional operation of the recycling plant on a site located to the south of the quarry site has not had a significant noise impact at properties in proximity to the quarry site relative to the quarry noise limits during daytime.

The noise monitoring surveys that have been undertaken previously in proximity to the existing quarry site at Ballinabarny report that the 'quarry noise was audible' at the residential properties. However, the noise monitoring survey undertaken in March 2022 in proximity to the Site indicates that the cumulative noise from the operation of the quarry and the adjacent recycling plant is not having a significant noise impact at the nearest residential properties. Therefore, it is concluded that operations during the Substitute Consent period at the Site, have not resulted, and are not resulting or unlikely to result in any a significant noise impact at the nearest residential properties.

9.0 CULTURAL HERITAGE

The scope of this cultural heritage assessment comprises a baseline study, effects analysis and retrospective impact assessment for the Development. The baseline is informed by the results of desk-based and archival research. The impact assessment considers both direct and indirect impacts of the Development upon cultural heritage assets.

In lieu of specific guidance from the Institute of Archaeologists of Ireland (IAI), this impact assessment conforms to the guidelines set out by the Chartered Institute for Archaeologists^{3,4}.

For the purposes of this rEIAR, the term 'cultural heritage' is used as a collective term to refer to all assets of archaeological, architectural and historical or cultural value. Archaeological heritage typically refers to objects, monuments, buildings, environmental remains or cultural landscapes older than AD 1700, although it can also be used to describe objects, monuments and other tangible remains that date from post-AD 1700. Architectural heritage (or built heritage) refers to structures or buildings (including their contents) of cultural value that are younger than AD 1700. Designed landscapes and gardens dating to post-AD 1700 are also considered to be architectural in this assessment. In both cases, the setting of an asset is considered an integral part of its value.

This assessment has considered the potential effects of the Development on cultural heritage during both the construction and operational phases. The term 'cultural heritage' is used collectively to refer to all assets of archaeological, architectural and historical or cultural value. The assessment included a detailed baseline study to establish the existing conditions, and an effects analysis and impact assessment that considered both direct effects (e.g. physical disturbance) and indirect effects (e.g. changes to setting due to dust and visual changes). The assessment of indirect effects has been informed by the results of other assessments, including the Air Quality and Climate, Noise and Vibration and Landscape and Visual technical assessments. Where required, appropriate mitigation measures have been proposed to avoid or reduce identified impacts.

The impact assessment conformed to the guidelines set out by the Chartered Institute for Archaeologists. This assessment has been produced in accordance with national and local legislation and policy, as well as best practice guidance.

³ CIfA, (2020). Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment.

⁴ CIfA, (2020). Standard and guidance for historic environment desk-based assessment.

There are three archaeological assets from the SMR recorded within the Study Area (all ringforts). None of these three assets are located within the Site. None of the assets within the Study Area are subject to a Preservation Order.

With regards to Architectural Heritage, there are no architectural assets listed on the National Inventory of Architectural Heritage Building Survey or Architectural Conservation Areas within the study area.

Impact Assessment and Mitigation Measures

Effects to cultural heritage assets can result from both direct and indirect effects. Direct effects are considered here to be those that result in an immediate, physical impact to an asset, such as ground disturbance.

Indirect effects could occur through environmental pathways and may be physical but may also affect the setting of an asset and can include, but are not limited to noise effects, air pollution/dust effects, and visual effects.

As no known cultural heritage assets are recorded within the Site, quarrying activity within the Site boundary is not considered to have resulted in any direct impacts to known cultural heritage sites, either designated or non-designated. As the presence of previously undiscovered archaeological remains to exist beneath the surface cannot be discounted on the basis of the information available (although it is considered to be low), there is potential that the quarrying activity at the Site may have directly impacted any undiscovered archaeological remains that may have existed, or may continue to exist, within the Site.

The air quality and noise assessments indicate that no significant effects have occurred during the operation of the Site. As such and given the relative distance of the ringforts from the Site boundary, no indirect effects on the setting of cultural heritage assets within the wider Study Area are considered likely to have occurred as a result of air or noise emissions.

The landscape and visual assessment has identified a number of visual changes that have occurred during operation of the Site, which are considered to have affected the setting of the three cultural heritage assets in the wider Study Area. Given the low-lying nature of the Site and the extent of existing vegetation within the landscape, a negligible magnitude effect is considered to have occurred at these assets. The magnitude of effects to the high asset value ringforts during the operations of the quarry is considered to have been negligible. Consequently, the significance of effects before mitigation is slight adverse.

Potential Undiscovered Archaeological Remains are potentially a very high value asset with a potential for a high magnitude of effect. Consequently, the significance of effect before mitigation has the potential to be Profound adverse in a conservative scenario, assuming in the worst-case that very high value archaeological remains did/do exist within the Site. No archaeological remains were reported over the review period at the Site.

No specific mitigation measures have been enacted on-site with regards to cultural heritage assets. As no specific mitigation measures have been enacted on-site, residual effects are ranked the same as for the significance of effect before mitigation.

Due to the nature of the Development and the likely effects described, potential cumulative effects would be limited to indirect effects to the setting of cultural heritage assets within the Study Area. As the landscape within the Study Area has remained relatively unchanged outside the Site, no cumulative effects upon cultural heritage assets are considered to have occurred.

No remedial measures are considered feasible to mitigate the residual effects that may have occurred to potentially undiscovered archaeological remains within the Site.

10.0 LANDSCAPE AND VISUAL

Landscape and Visual Impact Assessment (LVIA) is a tool used to identify and assess the effects of change and the significance of these effects, resulting from development on both the landscape and on people's views and visual amenity. The assessment of landscape and visual effects was carried out on the previously existing receiving environment using a baseline date of ca.1990. The assessment comprises a desktop and fieldwork study. The filed study captured eight viewpoints, representing local receptors around the quarry.

The methodology for remedial assessment of the landscape and visual effects was informed by key guidance documents including the 2013 UK Landscape Institute and Institute of Environmental Management and Assessment's Guidelines for Landscape and Visual Impact Assessment, 3rd Edition.

The site is located within the 'South East Mountain Lowlands' landscape area, which is an Area of Special Amenity (ASA). The Wicklow Landscape Character Assessment indicates that the site is contained predominantly within a Medium to Low sensitivity area.

The relevant scenic views identified in the Wicklow County Development Plan for the rEIA development are View 19 and View 20 and the relevant scenic route is prospect 37.

In terms of landform and drainage the quarry is contained in a subtle depression within an elevated plateau area of gently rolling terrain. There is a small stream that circulates the site around its northern and eastern quarters and the land rises eastwards towards hills at Bolagh to the east and Ballybarny to the south. The wider rural area is dotted with farmsteads and rural dwellings, but is generally sparsely populated, and the overall character is one of diverse, but familiar forms of rural productivity in a relatively tranquil and scenic area.

Visual receptors with the most potential to have been impacted by the expansion of the quarry since 1990 are local residents with views over the basin containing the quarry and roads users of the local road network that circulate the quarry. Whilst there are other sensitive receptor locations within the wider study area including the national Botanic Gardens at Killmacurragh, Avondale Forest Park and the settlements of Conary, Redcross and Rathdrum, due to terrain and vegetation screening coupled with substantial viewing distances, there is no material intervisibility. 'Parnell's Drive' is a sign-posted heritage / scenic driving route that passes over the elevated (forested) ridge to the southeast of the quarry.

Impact Assessment and Mitigation Measures

Landscape effects and the visual effects of development are related but assessed separately but the LVIA.

When assessing the potential effects on the landscape resulting from this development, the following criteria are considered:

- Landscape character, value and sensitivity;
- Magnitude of likely effects; and
- Significance of landscape effects.

Visual assessment considered the value of the views, and the visual susceptibility of the visual receptors (groups of people) and the changes to the composition and character of views.

Landscape Effects

The site and its immediate surrounds are strongly influenced by the existing quarry which has expanded considerably over the rEIA period. Whereas the immediate site area might originally have been considered patchwork farmland containing a quarry and occasional blocks of commercial conifer plantation, it is now defined more equally by the three productive rural land uses. Notwithstanding, the high-level Wicklow Landscape

Character Assessment designations, which are not particularly suited to a finer grained site level consideration of landscape sensitivity, the current landscape sensitivity is deemed to be Low. Based on the factors outlined above this may have been deemed Medium-low in 1990 but would still have been influenced by an existing quarry.

In the context of the wider study area, where the quarry represents a smaller and less influential feature of the overall landscape fabric, the high-level designations of the Wicklow Landscape Character assessment are more applicable. In this case the site is contained within a broad 'Area of Special Amenity', which is a median transitional classification between the highly sensitivity Mountain Area of outstanding Natural Beauty' and the less sensitive Corridor Area landscape. It is also shown on the landscape sensitivity map to be in an area typified by Medium to low sensitivity. On balance of the scenic amenity of the rolling patchwork farmland and wooded areas of this upland rural area with its values steeped in the sustaining the rural economy, the sensitivity of the landscape within the wider study area is deemed to be Medium. Furthermore, this level of sensitivity is not considered to have changed materially since 1990.

At the localised landscape scale (site and immediate vicinity), the landscape effect is considered Moderate on the basis of a Low degree of landscape sensitivity weighed against a High magnitude of landscape change. The changes to the landscape character are not considered to be as pronounced as changes to the physical landscape fabric, as the quarry is not an overtly visible feature within even the local landscape.

At the localised landscape scale (wider landscape), the landscape effect is considered Slight-imperceptible on the basis of a Medium degree of landscape sensitivity weighed against a Low-negligible magnitude of landscape change. The magnitude of change which has occurred at the wider landscape scale relates primarily to the landscape character. Despite the quarry having increased to nearly 8 times the extent since the 1990s, it is still not a strongly influential feature in the context of the wider landscape. It is contained in the base of a depression, is a shallow excavation and is relatively well screened or at least obscured by surrounding vegetation patterns. Unlike the site and its immediate context, the wider study area can still be classed as predominantly rolling patchwork farmland containing occasional variant rural land uses.

The significance of ongoing effects is considered Slight-imperceptible in the context of the established quarry and these do not extend beyond the immediate site context where the daily quarrying activities are less noticeable.

Visual Effects

The sensitivity of visual receptors does not range widely across the study area and particularly that part of it that affords views of the quarry as they are generally contained within the same basin landscape context. Views tend to be across a pleasant rural landscape setting of rolling fields and forestry and there is a degree of rural tranquillity. However, the views also consist of a typical productive landscape setting rather than a particularly distinct or naturalistic one. The elevation and vastness of views is a differentiating factor and those areas that afford broad vistas such as the elevated ground to the southwest are represented by designated scenic prospects in the Wicklow County Development Plan. Such views are considered to be of a High-medium sensitivity on balance of the fact that they are extensive, but still consist of a working rural landscape. Non-designated views of local receptors that are broad and pleasant are likely to be attributed Medium sensitivity, whereas those receptors with views that are not particularly broad or distinctive are likely to be assigned Medium-low sensitivity.

The visual change imparted by the current quarry was assessed relative to the likely visual impact of the 1990 baseline quarry using nine viewpoints from within the surrounding area. Despite all of these being within the central study area, not all of them have clear views of even the present-day quarry. Indeed, from six of the nine viewpoints the magnitude of visual change is deemed to be either Slight or Imperceptible. From three assessed view, which are all located in slightly elevated locations overlooking the quarry from less than 800m the

magnitude of visual change is deemed to be Moderate-slight and for similar reasons. The 1990 baseline quarry is likely to have been discernible, but not prominent in the broad views afforded across rolling patchwork farmland backdropped by the distant Wicklow Mountains. Whereas, the considerably larger present day quarry remains a relatively discreet feature within the base of the valley and partially screened / flanked by scrubby woodland and forest plantations. The current quarry is not considered to be an ambiguous feature in this productive landscape despite being the most intensive land use in view and it does not obstruct or unduly intrude on the extensive rural views.

Cumulative impacts

With regard to cumulative landscape effects, since 1990 the only notable change to the landscape that is associated with or similar to the quarry in terms of its scale and nature is the similar expansion of another quarry some 2km to the west within the Avonmore River Valley. Whilst together these two quarries make a slightly greater contribution to the land use fabric of the study area, this does not manifest in an equivalent contribution to landscape character as neither is an overt feature in the landscape and they are not intervisible. For the same reason, their combined contribution to cumulative visual impacts is also Negligible. Overall, it is considered that the expansion of the subject quarry in-combination with the similar expansion of other quarries within the study area results in not significant landscape or visual impacts.

Mitigation

Mitigation which has been put in place, and also to mitigation measures outlined in the Concept Restoration Plan, include retained existing hedgerow, shelterbelt/hedgerow planting, areas of natural regeneration and planting, fencing, and, establishment of dense forestry on sites south eastern boundary.

11.0 TRAFFIC AND TRANSPORT

This section of the rEIAR considers and assesses traffic effects resulting from quarrying related activities that have been carried out on the subject Site.

To assess impacts the subject site may have had on the historical and existing road network, the traffic profile arising from the activities on the subject lands from baseline year (1990) to today (2022) was calculated.

The capacity of the surveyed junctions was assessed using the Transport Research Laboratory's (TRL) Junctions 9 computer programme.

The development traffic was assigned to the entrance/exit of the subject lands, and distributed on the public road network, the commensurate receiving environment, in so far as that is reasonable and practical to evidence.

Impact Assessment and Mitigation Measures

The Site's existing, historical, access is located on the L5155, in the site's south-eastern corner. Access to the Site is by means of an existing gravel road, approximately 800m long. Planning permission (Ref. 06/4577) was granted by Wicklow County Council for a new access road and entrance to the sand and gravel pit in 2007, which has been constructed and use is only permitted to an authorised development. It is proposed to revert to use this route should substitute consent and further planning permissions be granted in respect of the quarry.

An estimation of traffic generation, including trips relating to export, and import, of materials and staff trips, for the subject lands and its impact, including interaction with existing and expected traffic in the surrounding area, was calculated with reference to historical levels of extraction and importation of material since 1990.

The quarry has always operated for 5.5 days per week for approximately 50 weeks per year. The historical annual extraction rate (tonnes per annum) has been used in determining the trips generated by the facility since 1990. Material leaving the site is transported in an average load of 25 tonnes.

The historical development traffic and the historical background traffic were used to determine the percentage of development traffic at each junction between 1990 to 2022. Following assessment, it was found that Junctions 1 and 2 exceeded the 10% threshold between 1990 and 2022, so warranted further investigation and assessment. As junctions 3 to 8 did not exceed the threshold between 1990 and 2022, no further assessment was required at these junctions, as the impacts are deemed to be negligible.

A junction capacity analysis was undertaken at Junction 1 and 2 based on an analysis of the historical background and development traffic at that location in accordance with Section 2.1 of the "Traffic and Transport Assessment Guidelines" published by TII. The results of the junction analysis indicates that the junctions have continued to operate within capacity between 1990 and 2022. Therefore, the development traffic between 1990 and 2022 was found to have a negligible impact on the local road network.

The low number of collisions, and the minor severity of the collisions recorded, do not indicate a collision pattern or cluster at, or near, the development site. Operation of the development site between 2005-2016 (only available data) is therefore deemed to have had a negligible impact on road safety.

Sightlines have been assessed against Section 5.6.3 of TII Publications document DN-GEO-03060, which requires 160m of unobstructed visibility (where the design speed is 80kph) at a point 3.0m back from the edge of the carriageway.

Whilst visibility is below that required in TII Publication DN-GEO-03060, there have been no recorded collisions at the quarry access/L5155 junction. Also, as the predominant movement of traffic exiting the quarry turns east on the L5155, the opportunity for westbound traffic (most affected by the reduced visibility) to conflict with HGVs exiting the quarry access is removed.

Additionally, a new quarry access has been granted planning approval by Wicklow County Council (permission granted in 2007). The new access has been constructed, however use is only permitted to an authorised development. It is proposed to use this entrance on the grant of substitute consent and further permissions which will offer improvements over the sightlines at the existing and historical access. The new access shall be located on the L5155, approximately 680m north of the existing/historical access.

12.0 MATERIAL ASSETS

This chapter of the rEIAR describes the likely significant direct effects of the Development on the material assets in the surrounding environment. Material Assets in the vicinity of the Site comprise of built services and infrastructure such as surface water drainage, telecommunications (including microwave linkages), electricity, gas, water supply infrastructure and sewerage. Other Material Assets include traffic and transport which have been assessed in a separate assessment.

Impact Assessment and Mitigation Measures

Impacts to Electrical Infrastructure / Utilities, Gas Infrastructure / Utilities, Telecommunication Infrastructure / Utilities, Water Supplies, Wastewater Networks, Waste Management Infrastructure, Water Supplies, and Surface Water Infrastructure are considered to have had an imperceptible effect since 1990. However, the impacts to the quantity and quality of surrounding water supplies, for groundwater well users, from quarrying activities on Site are considered to have had an imperceptible or slight effect.

The Development has utilised electricity supplies to the Site via an onsite connection to the grid installed specifically to provide a power supply to the Site. All works to the electrical power lines during the assessment period have been carried out in accordance with appropriate requirements and ESB Network guidelines. Previous extraction activities did not result in any significant impacts to the quality or availability of electrical utilities to the surrounding users.

There have been no requirements for a GNI connection to service Development. According to GNI, there are no gas pipelines in the area.

The Site's office currently does not use any telecommunications system. All records are held manually on site.

Water used on Site during the assessment period has been abstracted from existing groundwater wells on the Site. As the Site does not consume water from the local supply network, the impacts from the Site's activities on the water supply network are considered to be negligible. As part of the water management on the Site, water abstracted from the northwest waterbody is periodically discharged to the Newbawn stream following periods of prolonged rainfall, via settlement ponds. It is considered that this waterbody has sufficient capacity to accommodate periodic discharges. Overflow from the retention pond is returned to the pit area if necessary. Water treatment through a series of reed water cells polishes used water before discharging to the pond.

The Site utilised septic tank and percolation system for collection and treatment of wastewater/sewage. The septic tank is serviced annually where solids are removed for treatment or disposal offsite.

The Site has employed a number of measures to protect the underlying groundwater from activities which have been undertaken. This included the safe storage of chemicals, the bunding of fuel storage tanks and the use of an interceptor associated with the hardstanding under the refuelling area.

Waste arising from activities at the Site has been managed by appropriately authorised waste contractors.

The impacts identified during the assessment period were mitigated by design or good practice. Effects from the Site in isolation have been deemed in all instances to be not greater than Slight (adverse).

The closest quarry is Baleece Quarry, located 2.5 km northwest of the Site. Therefore it is not considered that there is potential for a significant cumulative effect on the Material Assets identified above.

No remedial measures have been identified in this chapter of the rEIAR. No specific monitoring is required in relation to material assets.

The assessment concludes that the Development did not give rise to significant adverse effects on material assets surrounding the Site during the assessment period of 1990 to 2022. In all cases the residual effect is no greater than slight and therefore overall, not significant.

13.0 INTERACTIONS, CUMULATIVE AND COMBINED EFFECTS

This chapter of the rEIAR describes interactions/inter-relationships between environmental effects and also effects of the Development in combination with other appropriate committed development in the region of the Site. The overall objective of this assessment is to identify, through a review of these issues, whether additional mitigation is required that would not otherwise have been identified in the individual study areas for these interacting or cumulative effects.

Interactions and Inter-relationships

Interactions of EIA study topic areas are typically displayed visually in a matrix table which identifies potential interactions which are likely to occur between the various disciplines. The assessment did not identify any additional potential for impacts further to those that had been identified in previous chapters of the rEIA.

Cumulative and Combined Effects

This section of the rEIA identified the potential for environmental effects and impacts of the Development in combination with other relevant committed development surrounding the Site.

Cumulative effects are defined as the addition of many non-significant or significant effects, including the effects of other projects, to create larger, more significant effects. Singular activities may have a non-significant effect in isolation, however when combined with other effects these can be collectively significant and therefore must be included in the EIA process.

Relevant developments in the region of the Application Site were examined to assess the likelihood and magnitude of combined environmental effects with the Development. A C&D waste recycling facility is located approximately 400m to the southeast of the application Site. The waste facility operates under permit conditions including environmental emissions thresholds of which there has been no exceedances to date. With the adoption of standard best practice construction management, no significant cumulative effects were noted further to those that had been identified in preceding chapters of the rEIA.

Signature Page

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