8

CLIMATE

8 CLIMATE

8.1 INTRODUCTION

This chapter of the EIAR has been prepared by WSP Ireland Consulting Ltd (WSP) and assesses the potential climatic impacts which can be reasonably expected to occur due activities relating to the continued operation of an existing quarry (Proposed Development) at Philipstown, Redbog and Athgarrett, Co. Kildare (the "Site").

Potential climate impacts can be generated through the following processes at the Site:

- Impacts of climate change on the development, including the sensitivity, exposure and the overall vulnerability of the development to impacts from relevant climate hazards; and
  Impacts of the development on the climate.

8.1.1 TECHNICAL SCOPE

This assessment has been made with guidance from the 'Guidelines on the information to be contained in environmental impact assessment reports', published by the EPA in May 2022. The guidelines were drafted by the EPA with a view to facilitating compliance with EIA Directive (2014/52/EU).

8.1.2 GEOGRAPHICAL AND TEMPORAL SCOPE

The assessment directly covers the physical extent of the EIA site boundary for the Site as shown in Figure 8-1. In the context of the EIAR, the EIA boundary contains lands which form the existing quarry site and some areas which extend beyond the working areas. The EIA boundary encompasses the Section 37L (the Planning Application) boundary, which is shown on the drawing set which accompanies the planning application.

The temporal scope of this assessment covers the current quarrying activities on the Site and the extension of these permitted activities into the future, with the Section 37L application boundary. Given the phased nature of the extractive industry and the similarities between the construction and operational phases of the Proposed Development, these will be considered together in this chapter as the overall operational phase.

Under the current programme of the Proposed Development, the extraction phase will last for 13 - 15 years, which will provide for fluctuations in market demands for the aggregate extracted from the Site. The duration of the extraction phase is therefore classified as 'medium-term' by the EPA's 2022 'Guidelines on the information to be contained in environmental impact assessment reports'.

The restoration phase of the Proposed Development will follow the extraction phase and will be 2 - 3 years in duration, which is 'short-term' - those lasting from one to seven years (EPA, 2022).

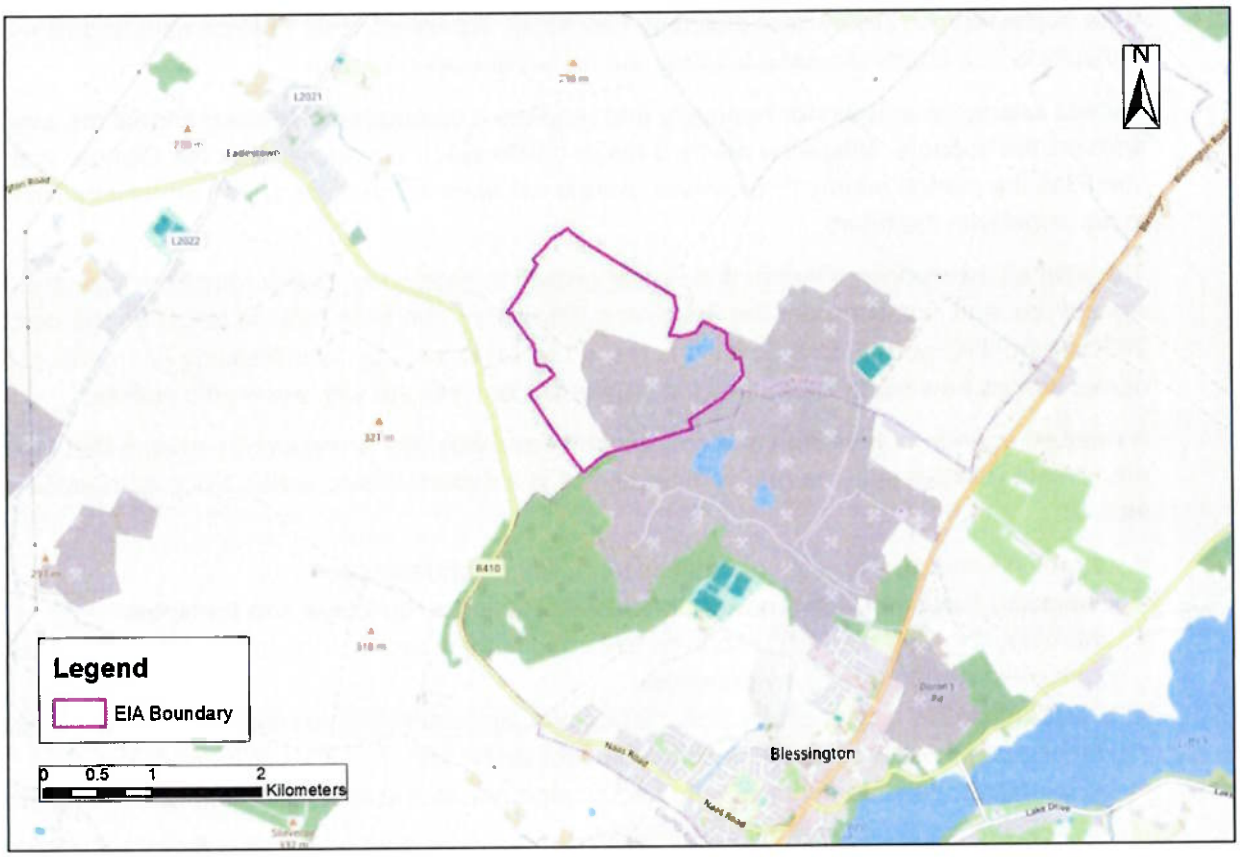

Figure 8-1 - Site location

8.2 LEGISLATIVE AND POLICY CONTEXT

8.2.1 LEGISLATION

Legislative references considered specifically for the assessment of climate from quarrying activities, and relevant statutory instruments in a planning context include:

- Directive 2014/52/EU of the European Parliament and of the Council, (amending Directive 2011/92/EU);
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, S.I. 296 of 2018; and
- Planning and Development Regulations 2001 (as amended).

Relevant statutory instruments in the context of quarrying include:

- Mines and Quarry Act 1965, 7 of 1965

8.2.2 RELEVANT POLICIES AND PLAN

National

The Climate Action Plan 2023 aims to transition to a decarbonised economy and achieve net zero greenhouse gas emissions by 2050. This Plan targets key economic and strategic areas and identifies actions required to enable the State to meet the 2050 targets. The plan outlines the current

state of play across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and charts a course towards the decarbonisation targets.

Climate change is a threat for humanity and requires a comprehensive international response to address the impacts. Mitigation will be a major challenge to our society and the Climate Action Plan identifies the central priority that climate change will have in the political and administrative systems in our country in the future.

The plan acknowledges concern that recent growth in emissions, particularly from Industry, Agriculture, and Transport put the State on a trajectory to be over 25% off target for the next 2021-2030 accounting period. This emissions growth is driven entirely by increasing economic activity and demonstrates how highly correlated industry emissions still are with economic activity.

A detailed agenda of transition and change in these industries is required to ensure that the sectors are climate resilient and can remain competitive in a decarbonising world. Such an agenda will include:

- Improving energy efficiency of processes, buildings and transport;
- Replacing fossil fuel with renewables in their processes, buildings and transport;
- Improving the way in which resources are used in their supply chain to reduce emissions and conform to circular economy principles;
- Being innovative across production, distribution, and marketing to realise the opportunities arising
- Developing the new skills and techniques necessary; and
- Developing measures of the climate and environmental impact of activities which will become more widely expected in the marketplace.

County Kildare

The Site is within the administrative boundary of Kildare County Council (KCC). The Kildare County Development Plan 2023-2029 (KCDP) acknowledges that mineral reserves are generally located within the rural area, and that the nature of the extractive industry is such that the industry must be developed where those resources occur.

The Plan also recognises that the industry can have damaging environmental effects and states that permission will only be granted where KCC is satisfied that residential and natural amenities will be protected, pollution will be prevented, and aquifers and groundwater safeguarded.

To ensure this, KCC notes that planning applications must account for potential environmental impacts as stated in their Mineral Resources & Extraction Industry Policy, as follows:

- **RD P8:** Support and manage the appropriate future development of Kildare's natural aggregate resources in appropriate locations to ensure adequate supplies are available to meet the future needs of the county and the region in line with the principles of sustainable development and environmental management and to require operators to appropriately manage extraction sites when extraction has ceased.

To support the KCDP, KCC has adopted the following objective in relation to climate within the extractive industry:

- **RD 048:** Manage the finite aggregate resources being mined by the extractive industries in the county to supply the future needs of our region while working to reach our climate change targets.

KCC has adopted policies in the KCDP in relation to the protection of climate.

KCC objectives which are relevant to the climate assessment include:

- **CS 02:** Ensure that the future growth and spatial development of County Kildare provides for a county that is resilient to climate change, enables the decarbonisation of the county's economy and reduces the county's carbon footprint in support of national targets for climate mitigation and adaption objectives as well as targets for greenhouse gas emissions reductions.
- **CS 08:** Support the implementation of Kildare's Climate Change Adaptation Plan in conjunction with relevant stakeholders.

8.2.3 RELEVANT GUIDANCE

This assessment has been made with guidance from the 'Guidelines on the information to be contained in environmental impact assessment reports', published by the EPA in May 2022.

Other guidance documents considered in this assessment include:

- Kildare County Council; Climate Change Adaptation Strategy, 2019 - 2024
- Climate Action Plan, 2023
- European Commission; Climate Change and Major Projects, 2016
- IEMA; Assessing Greenhouse Gas Emissions and Evaluating their Significance, 2017

8.3 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

8.3.1 ASSESSMENT AIMS

As identified above, the key objectives of this assessment are to assess:

- Impacts of climate change on the development, including the sensitivity, exposure and the overall vulnerability of the development to impacts from relevant climate hazards; and
- Impacts of the development on the climate.

The assessment of the development's vulnerability to climate change shall review published historical regional weather data to demonstrate the current climate impacts in the study area, and will also consider any relevant events reported by site personnel.

Impacts of the development on climate will consider GHG emissions calculation for the project life cycle and other aspects of the development design that may impact emissions.

8.4 CHARACTERISTICS OF THE DEVELOPMENT

The EIAR has been prepared to accompany a Section 37L for the continuation and extension of quarrying activities at the Site. The lands the subject of this EIAR (EIA boundary) extend to 95.8 ha. The area that makes up the Section 37L application planning unit extends to approximately 64.0 ha.

A continuation of activities at the Site are proposed with two lateral extensions, to the south and to the north. Proposed activities will involve the extraction of both rock (greywacke) and sand and gravel using excavation techniques, which include blasting for rock extraction in the south of the site. The extraction activities are proposed to be continued above the water table with dry quarrying of the sands and gravels and rock. This application for further development of the quarry is made concurrent with an application for substitute consent for the quarry that is accompanied by an rEIAR.

The lands surrounding the Site can be characterised as rural in nature, with land uses in the area being agricultural, industrial and single-house residential. The lands contiguous to the boundaries of the Site are in agricultural use to the north and west. To the south and east lands adjacent to the Site are aggregate extractive industry. There are scattered residential properties in the vicinity of the Site, primarily concentrated to the north of the site along the Local Road L6038-1, and to the west of the Site along the R410 and unnamed local roads.

8.5 POTENTIAL EFFECTS

8.5.1 CLIMATE CHANGE IMPACTS ON THE PROPOSED DEVELOPMENT

To assess the potential effects of climate change on the development the approach identified in European Commissions (2016) 'Climate Change and Major Projects' assessment guidance has been considered. Although the development is not a 'major project', this method is considered suitable guidance for such a climate change impact assessment. In designing and planning of such projects the guidance seeks to consider both climate change adaption and mitigation measures. Adapting a project is to ensure adequate resilience is built into the design to cope with relevant climate change impacts, e.g. flooding.

The assessment of project adaptions required first must assess the vulnerability of the Site and also the risk of impacts from relevant climate hazards.

The sensitivity, exposure and the overall vulnerability of the development over the lifetime of the extraction has been assessed below according to the most applicable climate variable and hazards. Climate change factors such as ocean acidification, sea-level rise and storm surges and waves have been scoped out of this climate assessment. For the development the most applicable climate variables and hazards to consider are:

- Increasing precipitation affecting groundwater levels;
- Fluvial flooding;
- The effects of colder weather extremes effecting site operations; and
- Potential drought conditions from prolonged heat.

The sensitivity of various aspects of the Proposed Development have been assessed in Table 8-1 with regards to the relevant climate hazards identified. On-site assets include any structures and accessible aggregate within the Proposed Development footprint. Inputs to the Site include the raw materials required for Site function, i.e. water and imported fuels. The quarry site's outputs are the extracted aggregate and transport linkages, including access to and from the site to the local road network.

Incidents of increased groundwater levels and fluvial flooding in the region coincide with periods of higher precipitation. The average annual rainfall recorded at Casement Aerodrome from 1964 to 2023 has been shown in Figure 8-2.

A river-network surface water feature is identified on the EPA Envision Mapviewer (Deerpark 09) ca. 700 m to the south the Site and flows to the southeast to the Poulaphouca Reservoir (Blessington lake). An unnamed river network feature (IE_EA_09L010400) flows ca. 400 m west of the proposed extension area and also joins the 'Deerpark 09' feature before it flows to the Poulaphouca Reservoir. As the Site is located far up gradient from these surface water features it is not anticipated to be at risk of fluvial flooding and surface water run-off will not flow from the site due to the inwards sloping nature of the floor and faces of the extraction area.

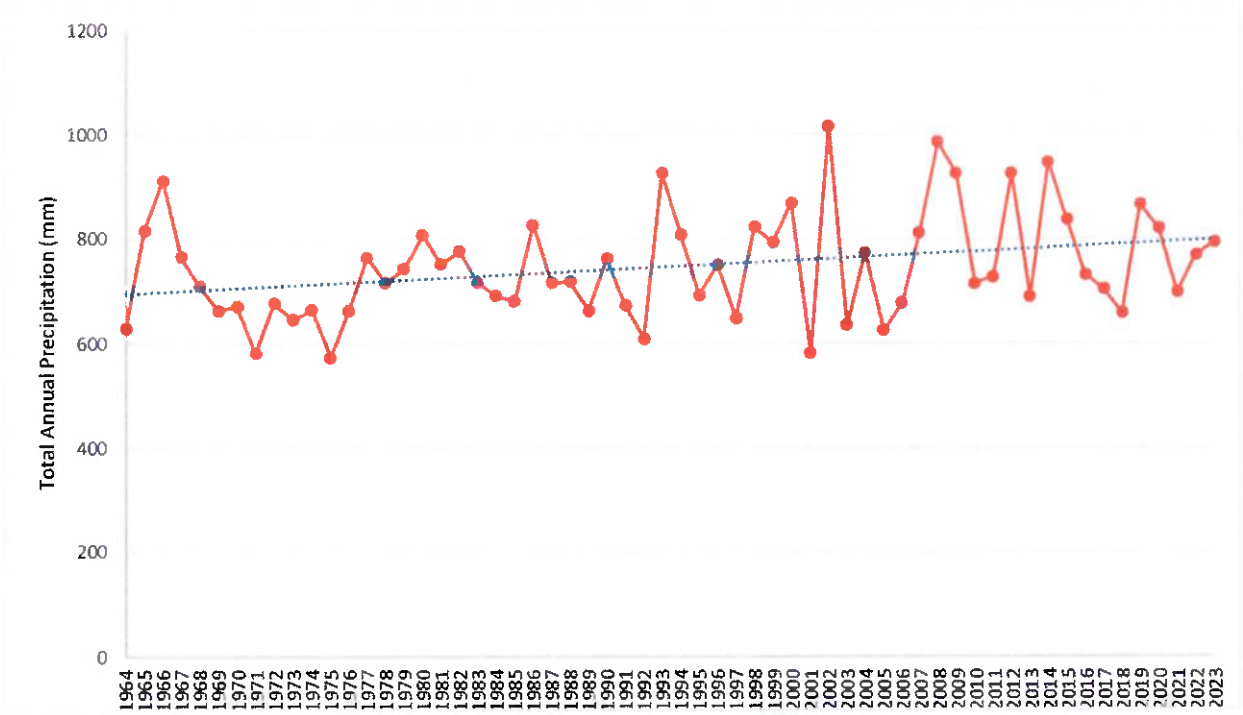

Figure 8-2 - Average annual precipitation recorded at the Met Eireann Casement station from 1964-2023

Table 8-1 -: Sensitivity of the development to relevant climate hazards.

Sensitivity	Climate Variables			
	Fluvial Flooding	**Precipitation and Groundwater Levels**	**Colder Weather Extremes**	**Heat/Drought**
On-site assets	Low	Medium	Low	Low
Inputs to site (water, fuels, etc.)	Low	Medium	Low	Medium (water)
Outputs (greywacke, treated mine water)	Low	Low	Low	Medium
Transportation Linkage	Low	Low	Medium	Low
Highest Sensitivity Score	**Low**	**Medium**	**Medium**	**Medium**

Table 8-2 presents an assessment of the development in relation to the current climate and future predicted climate changes. Future impacts have been assessed as low given the medium term duration of the assessment period (13-15 years) in addition to the mitigations which have been built into the Project at this stage.

Table 8-2 -: Exposure of the development to future climate change

Exposure	Climatic Variables			
	Fluvial Flooding	**Precipitation and Groundwater Levels**	**Colder Weather Extremes**	**Heat/Drought**
Current Climate	Low	Low	Low	Low
Future Climate	Low	Low	Low	Low
Highest Score	**Low**	**Low**	**Low**	**Low**

The combination of the Site's 'Sensitivity' and 'Exposures' have shown, overall, that the Site is at a Low risk from climate hazards (Table 8-3), which is considered to be 'not significant'. Further adaptions have been inbuilt into the Site as the area of extraction is the most exposed to potential climate impacts. Good site management in terms of groundwater monitoring and the good management of site excavations and run-off management during very extreme rainfall or flooding events have been incorporated into the design and operation of the quarry site. Following the implementation of these mitigation measures the overall impact from climate hazards at the site is considered to be 'imperceptible'.

Table 8-3 - Overall vulnerability of the development to relevant climate change events.

Vulnerability		Exposure (Current & Future Climate)		
		Low	**Medium**	**High**
Sensitivity	**Low**	Fluvial Flooding		
	Medium	Precipitation & Groundwater Levels Colder Weather Extremes Heat/Drought		
	High			

8.5.2 IMPACTS ON CLIMATE FROM THE DEVELOPMENT

The Proposed Development is not considered to be of a sufficient scale to have a 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 generated approximately 50 kt CO_2e per annum.

The continued operation of the Proposed Development is not anticipated to have significant effects on local prevailing weather conditions, nor it is anticipated to increase potential of flooding in the surrounding area.

Carbon release from the progressive stripping of soil and overburden will be minimal, however it's contribution to carbon emissions is noted. It is estimated that total of ca. 31.4 ha. of additional land will be disturbed with soil stripping in the course of this Proposed Development (combination of lateral void and formation of screening bunds). These operations will have the potential to result in a loss of soil organic carbon in form of CO_2. However, given the small area of stripping the liberation of soil organic carbon and impact on the climate is considered to be 'imperceptible' adverse.

Overburden will be stockpiled on the quarry site within the screening berms, in order to preserve topsoil quality and integrity. Coupled with the ecological screening areas set aside, the perimeter berms will ensure that the carbon loss through soil stripping is neutral. During restoration these soils will be redistributed across the site. This restoration regime at the Site and the is considered to have positive 'imperceptible' impacts on the climate during and post development.

Therefore, the impacts on climate and climate change are considered to be Not Significant.

8.5.3 THE HUDSON BROTHERS LTD ENVIRONMENT POLICY

HBL has committed to achieving and maintaining industry leading environmental standards and consider environmental management to be a priority. HBL has aimed for continuous improvement with regard minimising the environmental impact of their activities, conserving mineral and energy resources, reducing their visual impacts and minimising waste generation. They seek to exists as a good neighbour and have an open communication policy on environmental performance.

8.6 MITIGATION

Emissions from vehicles during the extraction and restoration phases of quarrying activities can add to the receiving air environment. With regards to climate impacts, it is anticipated that CO_2 will be emitted from vehicle exhausts during the construction, operational and restoration phases of existing and proposed development. As CO_2 is a key gas linked to climate change, the following mitigation measures will be put in place to limit vehicle and plant emissions from the mining activities:

- No vehicles or plant will be left idling unnecessarily;
- Vehicles and plant will be well maintained. Should any emissions of dark smoke occur (except during start up) then the relevant machinery will be stopped immediately, and any problem rectified before being used;
- Engines and exhaust systems will be regularly serviced according to the manufacturer's recommendations and maintained to meet statutory limits/opacity tests; Full loads used in road haulage in order to minimise the carbon footprint per load of exported materials;
- Site management will continue to explore energy efficiencies and incentives in the Site's electrical infrastructure and management practices to optimising energy consumption and GHG reduction in its operations. The energy reduction and efficient use will be promoted in areas of the Site including efficient site lighting using LED lighting.
- Undertake soils stripping during wetter periods (in as far as reasonably practical) to ensure carbon losses are reduced compared with warmer drier periods; and
- Minimising the double handling of materials.

Table 8-4**Error! Reference source not found.** presents an assessment of the potential impacts from the proposed development both with and without the establishment of appropriate mitigation measures. It is considered that the impact from vehicle emissions will have an imperceptible effect in the medium term whilst mining activities are taking place. An 'imperceptible effect' is defined by

the EPA in their 2022 'Guidelines on the information to be contained in environmental impact assessment reports' as 'An effects capable of measurement but without noticeable consequences'.

As noted above, upon completion the site will undergo planting of native tree and shrubs and indigenous plant species encouraged to re-colonize worked out areas. Restoration plans include the formation of a water body, providing an environment for increased biodiversity. Following the restoration and the establishment of agricultural land and the maturity of the planted areas of the site, there will be a permanent effect (>60 years) of carbon sequestration, resulting in a positive effect on the microclimate.

Table 8-4 - Assessment of Impacts to Climate and Mitigation Measures employed.

Impact	With / Without the establishment of Mitigation Measures	Type of Effect	Quality of Effects	Significance of Effects	Duration of Effects
Climate Hazards	Without	Direct	Negative	Not Significant	M-T
Climate Hazards	With	Direct	Negative	Imperceptible	M-T
GHG emissions from extraction activities – Plant and vehicles	Without	Direct	Negative	Not Significant	M-T
GHG emissions from extraction activities – Plant and vehicles	With	Direct	Negative	Not Significant	M-T
Carbon release from soil stripping	Without	Direct	Negative	Imperceptible	S-M
Carbon release from soil stripping	With	Direct	Negative	Imperceptible	P

Notes:

- Type of Effect – Direct and Indirect
- Quality of Effects – Positive; Neutral and Negative
- Significance of Effects – Imperceptible; Not significant; Slight Effects; Moderate Effects; Significant Effects; Very Significant; and Profound Effects;
- Duration of Effects – Momentary Effects (Seconds to minutes); Brief Effects (Less than a day); Temporary Effects (Less than a year); Short-term Effects (1 to 7 years); Medium-term Effects (7 to 15 years); Long-term Effects (15 to 60 years); and Permanent Effects (Lasting over 60 years)

8.7 RESIDUAL EFFECTS

Residual impacts of the proposed extraction activities on air quality, microclimate and climate change are considered to be imperceptible. In the longer term, on completion of the quarry site restoration, there will be a permanent effect (>60 years) of carbon sequestration, resulting in a positive effect on the microclimate. This will most likely constitute a minor positive impact for the local environment.

8.8 CUMULATIVE EFFECTS

There is potential for cumulative impacts on the climate and from climate hazards between the proposed development and the adjacent existing quarries to the south and east. However, these impacts are considered to be negligible in view of the scale of operations, predominantly rural nature of other surrounding land, and local topography.

8.9 DIFFICULTIES ENCOUNTERED

No particular difficulties were encountered in the preparation of this chapter of the EIAR.

8.10 SUMMARY AND CONCLUSIONS

This assessment considers the potential impacts and effects of the Proposed Development on the surrounding climate.

The main receptors that could be affected by changing climate due to activities at the Site were identified and potential effects were assessed.

The assessment concludes that the Proposed Development is not considered to be of a sufficient scale to have a potential to impact the regional or local climate in any significant manner.

Furthermore, the assessment of the combination of the Site's 'Sensitivity' and 'Exposures' have shown, overall, that the Site is at a Low risk from climate hazards, which is considered to be 'not significant'. Further adaptions have been inbuilt into the Site as the area of extraction is the most exposed to potential climate impacts. Good site management in terms of groundwater monitoring and the good management of site excavations and run-off management during very extreme rainfall or flooding events have been incorporated into the design and operation of the quarry site. Following the implementation of these mitigation measures the overall impact from climate hazards at the site is considered to be 'imperceptible'.

8.11 REFERENCES

Department of the Environment, Climate and Communications. 2022. *Climate Action Plan 2023.*

European Commission. 2016. *Climate Change and Major Projects*

EPA. 2022. *Guidelines on the information to be contained in Environmental Impact Assessment Reports.*

IEMA. 2017. *Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance.*

Kildare County Council (2023) *Kildare County Development Plan 2023-2029.*

9

NOISE AND VIBRATION

PUBLIC

9 NOISE AND VIBRATION

9.1 INTRODUCTION

This Environmental Impact Assessment Report (EIAR) has been prepared to accompany a planning application to be made under S.37L of the Planning and Development Act, 2000 as amended for the continuation of extraction at an existing quarry at Philipstown and Red Bog, Co. Kildare. The Proposed Development is located within the administrative boundary of Kildare County Council, (KCC).

This chapter of the EIAR has been prepared by WSP Ireland Consulting Ltd (WSP) and assesses the potential noise and vibration impacts associated with the Proposed Development during extraction (and restoration) at the Application Site.

The following assessment was prepared by Kevin McGillycuddy (BA (Mod), MSc), and Simon Faircloth (PGDip MIOA). Kevin is a Practitioner Member of the Institute of Environmental Management and Assessment and has more than 11 years' experience in environmental consultancy. Simon is a Corporate Member of the Institute of Acoustics and has over 17 years' experience in acoustic consultancy.

9.1.1 SCOPE OF ASSESSMENT

The EIA Directive (Directive 2011/92/EU, as amended by Directive 2014/52/EU), requires that a description of the likely significant effects of the project on the environment resulting from the emission of pollutants, including noise and vibration.

The scope of this assessment has included the following:

- Identification of the study area and sensitive receptors;
- Analysis of noise and vibration survey data;
- Derivation of applicable noise criteria;
- Prediction of operational phase noise and vibration impacts;
- Evaluation of noise and vibration impacts against criteria; and
- Specification of appropriate mitigation, if required.

9.1.2 EFFECTS SCOPED OUT – HGV CONTRIBUTION TO ROAD TRAFFIC NOISE

DMRB LA111 (see Section 9.2.3) provides scoping criteria for the evaluation of operational noise from a road. With reference to the LA111 scoping criteria provided in Section 3.4.1, the following questions need to be considered:

1) Is the project likely to cause a change in the basic noise level (BNL) of 1 dB $L_{A10,18hr}$ in the 'do minimum' opening year compared to the 'do something' opening year?
2) Is the project likely to cause a change in the BNL of 3 dB $L_{A10,18hr}$ in the 'do something' future year compared to the 'do minimum' opening year?
3) Does the project involve the construction of new road links within 600 m of noise sensitive receptors?
4) Would there be a reasonable stakeholder expectation that an assessment would be undertaken?

In consideration of the first two questions, with all other factors remaining the same, i.e. vehicle speed, road gradient and surface type, an increase in traffic flow of 25% would be required in the short term to facilitate a 1dB increase in traffic noise. To facilitate a 3dB increase in traffic noise in the longer term would require a double in road traffic flow.

The current application does not propose an increase in traffic generated by the facility. Operations at the Application Site will remain relatively consistent with previous production rates. There is likely to be small increase in extraction tonnage (1,016,000 tonnes per annum compared with circa 1,000,000 tonnes per annum at present) but this is primarily due to a small increase in the average HGV size used to export the extracted aggregate from the Site.

For the final two scoping questions, the proposals do not include any new road construction and it is unlikely that there would be reasonable expectation from stakeholders that an assessment of noise from operational road traffic would be required seeing as HGV movements will not change.

Changes in operational phase traffic noise levels have therefore been scoped out of this assessment.

9.1.3 SITE LOCATION AND SETTING

The Site is located in the east of Co. Kildare, immediately west of the border with Co. Wicklow, and ca. 1.8 km northwest of Blessington and ca. 7.5 km northeast of Naas. The lands surrounding the Site to the north and west can be characterised as rural in nature, with land uses in the area being agricultural and single house residential. Glen Ding Wood is located in the lands further to the south-west defined as forestry and a semi-natural area. Quarrying and aggregate extraction are widely practiced in the adjacent lands to the east and south. The quarries in the Blessington area are a major source of aggregate used in the production of construction material in the Greater Dublin region.

The Site is located within an area of historical quarrying. The existing operational quarry has been in use since the early 1950s and has been registered with Section 261, Planning & Development Act 2000 (Quarry Ref. No. QR42) and subsequent planning permission for continuation of quarrying operations was granted under Planning Reg. Ref. 07/267.

9.1.4 GEOGRAPHICAL, TEMPORAL SCOPE AND NOISE SENSITIVE RECEPTORS

The geographical study area for the assessment covers the EIA site boundary (Site) (identified on Figure 9-1) and a buffer zone of around 500 m from the EIA boundary (i.e. the study area), because most potential effects due to noise and vibration emissions from the Proposed Development are anticipated to occur within this area. This area includes the receptors anticipated to be impacted by quarry operations. The closest receptors are located approximately 35 metres northeast of the EIA boundary. Representative Noise Sensitive Receptors (NSRs) considered within this assessment are shown in **Figure 9-1** and are listed in Table 9-1.

Note that each of these receptors may also be considered for the purposes of this assessment to be vibration sensitive.

In the context of the EIAR, the Site boundary contains lands which form the existing quarry site and some areas which extend beyond the working areas.

The temporal scope of the assessment covers current 'baseline conditions' of the Site and draws on available historical information. The assessment aims to establish the baseline conditions at the

Site and then assess what impacts the proposed extension of quarrying activities will have on the Site and surrounding environment.

Under the current programme of the Proposed Development, the extraction phase will last for 13 - 15 years, which will provide for fluctuations in market demands for the aggregate extracted from the Site. The duration of the extraction phase is therefore classified as 'medium-term' by the Environmental Protection Agency's (EPA) 2022 'Guidelines on the information to be contained in environmental impact assessment reports'. The Proposed Development totals a remaining volume of ca. 8,708,900 m^3 (13,218,200 tonnes) of combined sands and gravels and rock. This is made up of ca. 5,544,900 m^3 (8,317,350 tonnes) of sands and gravels and ca. 1,960,345 m^3 (4,900,860tonnes) of rock.

The restoration phase of the Proposed Development will follow the extraction phase and will be 2 - 3 years in duration, which is 'short-term' - those lasting from one to seven years (EPA, 2022). From a noise perspective restoration works will be substantially less intensive than the operational phasing of the Proposed Development and as such the assessment of the operational phases in this chapter represents a worst-case assessment compared with the restoration phase. No blasting will occur in the restoration phase of the Proposed Development.

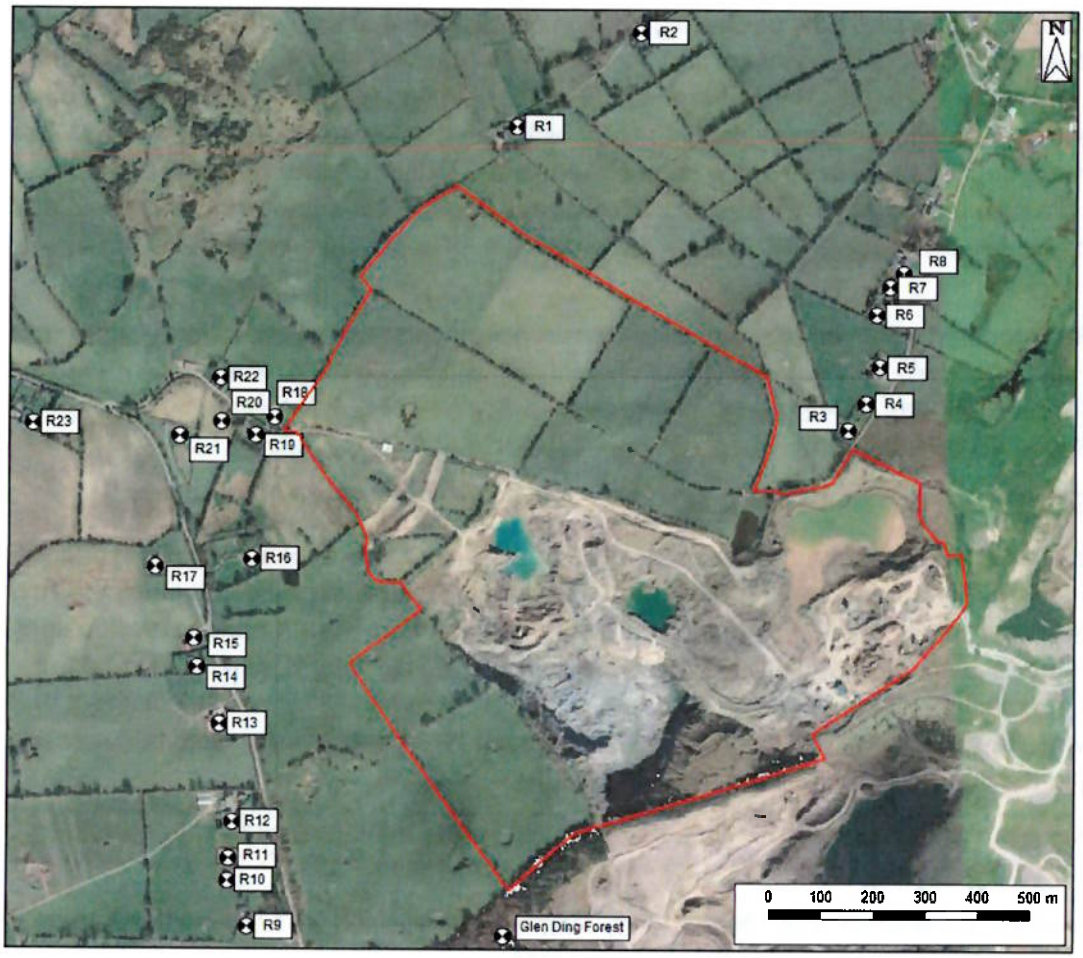

Figure 9-1: Location of the Site (EIA site boundary) with NSRs identified

Note that each of these receptors may also be considered for the purposes of this assessment to be vibration sensitive.

Table 9-1: Coordinates of relevant NSR prediction locations. All receptors are residential properties unless stated otherwise.

Receptor	Coordinates (m) – Irish National Grid		
	Easting (X)	Northing (Y)	Height (Z)
R1	296860	217527	236
R2	297095	217708	230
R3	297493	216951	271
R4	297527	217002	280
R5	297552	217072	270
R6	297546	217171	264
R7	297571	217224	260
R8	297596	217251	259
R9	296353	216003	228
R10	296315	216091	220
R11	296318	216132	219
R12	296323	216203	219
R13	296299	216389	216
R14	296256	216497	210
R15	296249	216551	206
R16	296359	216703	215
R17	296176	216687	207
R18	296400	216973	209
R19	296364	216940	206
R20	296299	216965	207
R21	296220	216937	207
R22	296296	217047	202
R23	295940	216961	205
Glen Ding Wood (non-residential)	296842	215985	275

9.2 LEGISLATIVE AND POLICY CONTEXT

9.2.1 LEGISLATION

Legislative references considered specifically for the assessment of noise from quarrying activities and relevant statutory instruments in a planning context include:

- Directive 2014/52/EU of the European Parliament and of the Council, (amending Directive 2011/92/EU);
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, S.I. 296 of 2018; and
- Planning and Development Regulations 2001 (as amended).

In addition to the above, Directive 2002/49/EC provides a basis for developing and completing the Community measures concerning noise emitted by the major sources, in particular; road and rail vehicles and infrastructure, aircraft, outdoor and industrial equipment and mobile machinery. The Directive applies to environmental noise in which humans are exposed, particularly built-up areas, public parks or quiet areas in an agglomeration, quiet areas in open country, near schools, hospitals and other noise-sensitive buildings and areas.

"Environmental noise" is defined within the Directive as "unwanted or harmful outdoor sound created by human activities, including noise emitted by means of road traffic, and from site of industrial activity…"

9.2.2 RELEVANT POLICIES AND PLANS

The Kildare County Development Plan 2023-2029 (KCDP) is the key strategy document which structures the proper planning and sustainable development of land-use across County Kildare over the six-year statutory time period of the plan. The KCDP seeks to ensure that proposals in the county take account of the need to prevent major accidents involving hazardous substances and safeguard the public, property and the environment.

The KCDP acknowledges the potential environmental effects of the aggregate industry and the importance of protecting surrounding residential and natural amenities. The KCDP also identifies that gravel resources are important to the economy and provide a valuable source of employment in some areas of the county. There is an increasing demand for aggregates and that areas for extraction of aggregates and minerals are needed in the county. To address this the KCDP identifies that planning policies should be carefully constructed to avoid adverse effects on aggregate resources and related extractive industries. The KCDP notes that it is necessary to ensure that aggregates can be sourced without significantly damaging the landscape, environment, groundwater and aquifer sources, road network, heritage and / or residential amenities of the area. KCC has adopted policies and objectives within the development plan in relation to the protection from adverse environmental impact from extractive industry, which includes nuisance noise and excessive vibrations from these projects. The Council acknowledges that nuisance noise and vibrations can have negative effects on the environs.

KCC policies relevant to the assessment of noise and vibration in respect to the extraction industry include:

RD P8 – (It is the policy of KCC to*) Support and manage the appropriate future development of Kildare's natural aggregate resources in appropriate locations to ensure adequate supplies*

are available to meet the future needs of the county and the region in line with the principles of sustainable development and environmental management and to require operators to appropriately manage extraction sites when extraction has ceased.

KCC objectives relevant to the assessment of noise and vibration from extractive industries includes:

RD O42 – (It is the policy of KCC to) *Ensure that development for aggregate extraction, processing and associated concrete production does not significantly impact the following:*

- *Special Areas of Conservation (SACs)*
- *Special Protection Areas (SPAs)*
- *Natural Heritage Areas (NHAs)*
- *Other areas of importance for the conservation of flora and fauna.*
- *Zones of Archaeological Potential.*
- *The vicinity of a recorded monument.*
- *Sensitive landscape areas as identified in Chapter 13 of this Plan.*
- *Scenic views and prospects.*
- *Protected Structures.*
- *Established rights of way and walking routes.*
- *Potential World Heritage Sites in Kildare on the UNESCO Tentative List, Ireland.*

RD O44 – (It is the policy of KCC to) *Require applications for mineral or other extraction to include (but not limited to):*

- *An Appropriate Assessment Screening where there is any potential for effects on a Natura 2000 site.*
- *An Environmental Impact Assessment Report (EIAR).*
- *An Ecological Impact Assessment may also be required for subthreshold developments to evaluate the existence of any protected species / habitats on site.*

RD O44 – (It is the policy of KCC to) *Have regard to the following guidance documents (as may be amended, replaced, or supplemented) in the assessment of planning applications for quarries, ancillary services, restoration and after-use:*

- *Quarries and Ancillary Activities: Guidelines for Planning Authorities, DEHLG (2004). – Environmental Management Guidelines*
- *Environmental Management in the Extractive Industry (Non-Scheduled Minerals), EPA (2006). – Archaeological Code of Practice between the DEHLG an ICF (2009).*
- *Geological Heritage Guidelines for the Extractive Industry (2008).*
- *Wildlife, Habitats, and the Extractive Industry – Guidelines for the protection of biodiversity within the extractive industry, NPWS (2009).*

9.2.3 RELEVANT GUIDANCE

This assessment has been made with guidance from The Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (May 2020). A glossary of acoustic terminology has been provided in Appendix 9A. Other guidance related specifically to noise and vibration has been identified below.

NG4: Guidance Note for Noise: Licence Applications, Surveys and Assessment in Relation to Scheduled Activities

The most recent Irish guidance document in relation to noise was published in 2016 by the EPA, Office of Environmental Enforcement (OEE), entitled 'Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)'.

NG4 sets methods for addressing noise from operations that fall under IPPC and Waste Licensing functions of the EPA's Office of Environmental Enforcement (OEE). The activities at the Development are not Scheduled Activities but the NG4 guidance provides detailed consideration of a range of noise related issues including basic background to noise issues, various noise assessment criteria and procedures, noise reduction measures, Best Available Techniques (BAT) and the detailed requirements for noise surveys. NG4 identifies typical limit values for noise from licensed sites as: Daytime (07:00 to 19:00hrs) – 55dB $L_{Ar,T}$; Evening (19:00 to 23:00hrs) – 50dB $L_{Ar,T}$; and, Night-time (23:00 to 07:00hrs) – 45dB $L_{Aeq,T}$.

NG4 identifies the following guidance as potentially appropriate for assessing noise, subject to the use of the methodology being considered and justified by a competent person:

- BS 4142: 2014: Methods for rating and assessing industrial and commercial sound – evaluation of industrial and commercial noise sources at residential properties;
- BS 8233: 2014 Guidance on sound insulation and noise reduction for buildings – outline guidance on noise matters and deals specifically with noise within buildings; and
- BS 5228-1: 2009 + A1: 2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise – outline guidance on prediction and control of noise from construction and open sites.

British Standard BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1: Noise

BS 5228 provides a procedure for the estimation of construction noise and vibration levels and for the assessment of the significance of the predicted effects at the nearest sensitive receptors. Annex D of the Standard includes measured typical noise levels for a range of construction plant and activities.

The Standard provides several methods for the evaluation of the significance of construction noise effects. The ABC method considers significance by comparison to the measured baseline $L_{Aeq,T}$ noise level, rounded to the nearest 5 dB. Three categories of threshold values are provided: A, B and C, in increasing 5 dB bands, for the periods "daytime and Saturdays", "evenings and weekends" and "night-time". If the construction site noise level exceeds the relevant threshold value this is deemed a 'significant effect'. Furthermore, where the measured baseline exceeds the highest category C, a 3 dB increase over baseline is considered significant. The evaluation periods and thresholds of potential significant effect are set out in the table below:

Table 9-2: Example threshold of potential significant effect at dwellings

Assessment Category and Threshold Value Period	Threshold Value (dB $L_{Aeq,T}$)		
	Category A [A]	Category B [B]	Category© [C]
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends [D]	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

Notes:
[1] A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.
[2] If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.
[3] Applied to residential receptors only.

(A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.
(B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A value (C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.
(D) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

The second method states that "*Noise levels generated by site activities are deemed to be potentially significant if the total noise (pre-construction ambient plus site noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut off values of 65 dB, 55 dB and 45 dB $L_{Aeq,T}$ from site noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant impact.*"

These criteria may be applied not just to residential buildings, but also to hotels and hostels and buildings in religious, educational and health/community use.

The +5 dB criterion for a period of one month or more, might also be deemed to cause significant effects in public open space. However, the extent of the area impacted relative to the total available area also needs to be taken into account.

Annex F of the Standard provides guidance on estimating noise from construction sites. The estimation procedures described in this Annex take into account the following more significant factors:

- sound power outputs of processes and plant;
- periods of operation of processes and plant;
- distances from source to receiver;
- the presence of screening by barriers;
- reflections of sound; and
- attenuation from absorbent ground.

Four discrete prediction methods are described, two for stationary plant – the activity $L_{Aeq,T}$ method and the plant sound power method – and two for mobile plant – the method for mobile plant in a defined area and the method for haul roads.

British Standard BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 2: Vibration

The Standard provides the latest recommendations for basic methods of vibration control where there is a need for the protection of persons living and working in the vicinity of, and those working on, construction and open sites.

With respect to human exposure to building vibration, Table B1 of Annex B to BS 5228-2 provides guidance on the effects of vibration levels on human beings, and it is these (as reproduced in the table below) that the construction vibration effects have been based upon.

Table 9-3: Guidance on effects of vibration levels

Vibration Level (mm/s)	Effect
0.14	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3	Vibration might be just perceptible in residential environments.
1.0	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.
10	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

Notes:
[1] The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.
[2] A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.
[3] Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472-1 or -2, and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.

Guide values for cosmetic damage to buildings are given in Table B.2 of the Standard, and this is reproduced below, together with Figure B.1 (also reproduced below) to which it refers.

Table 9-4: BS 5228-2 Guidance on transient vibration guide values for cosmetic damage

Line (see Figure below)	Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse (mm/s)	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures and industrial and heavy commercial buildings	50 (at 4 Hz and above)	50 (at 4 Hz and above)
2	Unreinforced or light framed structures and residential or light commercial buildings	15 (at 4 Hz) increasing to 20 (at 15 Hz)	20 (at 15 Hz) increasing to 50 (at 40 Hz and above)

Notes:
[1] Values referred to are at the base of the building.
[2] For line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

It should be noted that the above guidance is for transient vibration. For continuous vibration, such as may occur during the use of vibratory equipment, the guidance in the Standard is that the levels in the table above and figure below be reduced by 50%.

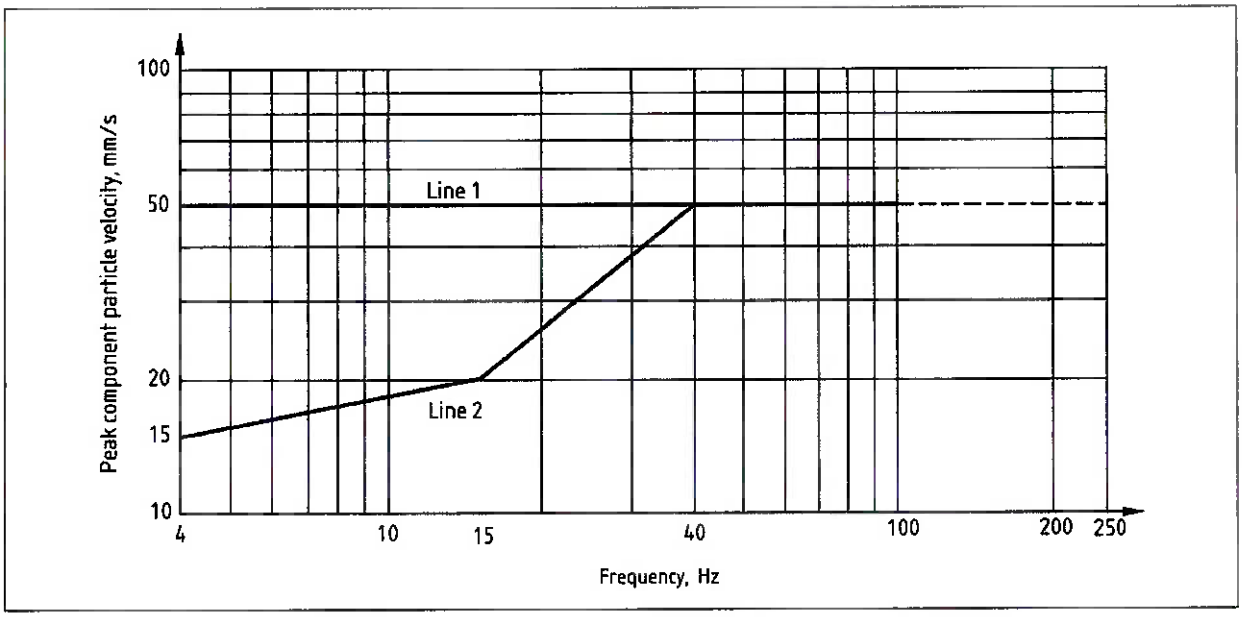

Figure 9-2: BS 5228-2 Guidance on transient vibration guide values for cosmetic damage

BS 6472:2008 Guide to evaluation of human exposure to vibration in buildings. Part 2: Blast induced vibration (BS 6472-2)

The Standard provides guidance on human exposure to blast-induced vibration within buildings. It describes the characteristics of both blast-induced vibration and air overpressure and provides guidance on methods of measurement and prediction of both phenomena. BS 6472-2 also acknowledges the difficulties experienced in the accurate prediction of air overpressure generated by explosive blasts.

Table 1 in BS 6472-2 (reproduced here in Table 9-5) provides maximum magnitudes of vibration that are acceptable with respect to human response for up to three blast vibration events per day.

Table 9-5: Maximum satisfactory magnitude of vibration with respect to human response for up to three blast vibration events per day

Place	Time	Satisfactory Magnitude, PPV (mm/s)
Residential	Day – 08:00 to 18:00 Mon-Fri, 08:00 to 13:00 Saturdays	6.0 to 10.0
	Night – 23:00 to 07:00	2.0
	Other times	4.5
Offices	Any time	14.0
Workshops	Any time	14.0

With respect to satisfactory magnitudes of air overpressure, the Standard advises that: "Windows are generally the weakest parts of a structure exposed to air overpressure. Research by the United States Bureau of Mines has shown that a poorly mounted window that is pre-stressed can crack at around 150 dB(lin), with most windows cracking at around 170 dB(lin). Structural damage would not be expected at air overpressure levels below 180 dB(lin)."

BS 7385: Evaluation and measurement for vibration in buildings, Part 1 1990: Guide for measurement of vibrations and evaluation of their effects on buildings and Part 2 1993: Guide to damage levels arising from ground borne vibration

BS 7385 states that there should typically be no cosmetic damage if transient vibration does not exceed 15 mm/s at low frequencies rising to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above.

BS 7385 also provides the same comments regarding air overpressure as that provided in BS 6472-2.

BS 7445-1:2003 Description and Measurement of Environmental Noise. Guide to Quantities and Procedures.

BS 7445 provides guidance on appropriate environmental noise monitoring, including specification of equipment and appropriate calibration intervals, suitable weather conditions and observations to note regarding the nature of the noise environment.

British Standard BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (BS 8233), 2014

The scope of BS 8233 is the provision of guidance for the control of noise in and around buildings. It suggests appropriate criteria for different situations, which primarily are intended to guide the design of new buildings, or refurbished buildings undergoing a change of use. The noise level criteria recommended in BS 8233 for residential spaces are based on the World Health Organisation Guidelines for Community Noise and are summarised in Table 9-6 below.

Table 9-6: Indoor ambient noise levels for dwellings (BS 8233 Table 4)

Activity	Location	Daytime (dB $L_{Aeq,16hour}$) 07:00 to 23:00	Night-time (dB $L_{Aeq,8hour}$) 23:00 to 07:00
Resting	Living room	35	-
Dining	Dining room/area	40	-
Sleeping (daytime resting)	Bedroom	35	30

Note 7 to the above table states:

"Where development is considered necessary or desirable, despite external noise levels above WHO (World Health Organisation) guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved."

On design criteria for external noise, BS 8233 states that:

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments".

Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (2006).

The EPA's 2006 guidance on Environmental Management in the Extractive Industry (Non-Scheduled Minerals) outlines primary sources of noise associated with quarrying and offers guidance on assessment and mitigation. Recommended noise limit values are 55dB $L_{Aeq,1hr}$ and 45dB $L_{Aeq,15min}$ for daytime and night-time respectively.

World Health Organisation (WHO) Guidelines for Community Noise, 1999

The WHO guidelines consolidate scientific knowledge on the health effects of community noise and provide guidance to environmental health authorities and professionals trying to protect people from the harmful effects of noise in non-industrial environments. The main sources of community noise are identified as road, rail and air traffic, industries, construction and public work and neighbours.

A wide range of specific effects and environments are considered in the guidelines but a few that relate to this study are described below.

With regard to community noise, the guidelines state (in section 4.2.7) that annoyance "*varies with the type of activity producing the noise…..During the daytime, few people are seriously annoyed by activities with L_{Aeq} levels below 55 dB; or moderately annoyed with L_{Aeq} levels below 50 dB.*" The time base for these values, which relate to the daytime period, is 16 hours.

In dwellings, the critical effects of noise are on sleep, annoyance and speech interference. To avoid sleep disturbance "*indoor guideline values for bedrooms are 30 dB L_{Aeq} for continuous noise and 45 dB L_{Amax} for single sound events*".

Design Manual for Roads and Bridges (DMRB) LA 111 Noise and vibration (revision 2), 2020
DMRB LA 111 was first published in November 2019, superseding DMRB HD213/11 which was withdrawn at that time. The document sets out the requirements for noise and vibration assessments from road projects, including operational and construction noise, applying a

proportionate and consistent approach using best practice and ensuring compliance with relevant legislation.

For operational road traffic noise, the magnitude of change shall be defined in accordance with LA 111 Table 3.54a (short-term) and Table 3.54b (long term). These tables are combined below.

Table 9-7: Magnitude of change – short and long-term

	Noise Change (dB $L_{A10,18h}$) or L_{night}	
Magnitude of Impact	Short-term	Long-term
Major	Greater than or equal to 5.0	Greater than or equal to 10.0
Moderate	3.0 – 4.9	5.0 – 9.9
Minor	1.0 – 2.9	3.0 – 4.9
No change or negligible	Less than 1.0	Less than 3.0

For the assessment of magnitude of impact due to construction noise, LA111 recommends adopting the criteria provided in Table 9-8.

Table 9-8: Magnitude of impact due to construction noise

Magnitude of Impact	Construction Noise Level
Major	Above or equal to threshold level +5 dB
Moderate	Above or equal to threshold level and below +5 dB
Minor	Above or equal to threshold level
Negligible	Below existing baseline level

where the threshold level is determined using the 'ABC Method' as described in BS 5228-1:2009+A1:2014 Section 3.2 and Table E.1 (see Table 9-2). Note that LA111 states that the impact of noise from construction traffic on public roads may be evaluated against the short-term noise change criteria provided in Table 9-7. LA 111 further states that the initial assessment of likely significant effect on noise sensitive buildings shall be determined using Table 3.58, reproduced below.

Table 9-9: Initial assessment of operational noise significance

Significance	Short-term Magnitude of Change
Significant	Major
Significant	Moderate
Not significant	Minor
Not significant	Negligible

Where the magnitude of change in the short term is negligible or minor at noise sensitive buildings, it shall be concluded that the noise change will not cause changes to behaviour or response to noise and as such, will not give rise to a likely significant effect.

Note that the 'major', 'moderate' and 'minor' magnitudes of impact referenced in LA11 correlate to 'high', 'medium' and 'low' magnitudes of impact referenced within this EIAR (see Section 9.3.1.3).

9.3 ASSESSMENT METHODOLOGY

9.3.1 NOISE IMPACT ASSESSMENT

9.3.1.1 Proposed Noise Limits

The Site's existing planning permission (KCC Reg. Ref.: 07/267, Condition 33), states the following with respect to noise and vibration:

(a) *'The noise level attributable to all on-site operations associated with the proposed development shall not exceed 55 dB(A) (L_{eq}) over a continuous one-hour period between 0800 hours and 1800 hours Monday to Friday inclusive (excluding bank holidays), and between 0800 hours and 1300 hours on Saturdays, when measured outside any noise sensitive location house in the vicinity of the site. Sound levels shall not exceed 45 dB(A) (L_{eq}) at any other time.'*

(b) *A Noise Assessment shall be carried out on the site by a competent Noise Consultant within 1 month of commencement of on-site operations and at 6 monthly intervals thereafter or at any other time specified by the Planning Authority and shall give advance notice as specified by the Planning Authority. The locations of the noise monitoring stations shall be agreed with the Planning Authority. The Noise Assessment shall be submitted to the Planning Authority.*

(c) *Vibration due to blasting activities shall not exceed a peak particle velocity of 12 mm/s when measured in any of the three mutually orthogonal directions (for vibration with a frequency at less than 40 Hz) at any vibration sensitive location in the vicinity of the site. Air overpressure shall not exceed 125 dB (linear maximum peak value) at any overpressure sensitive location in the vicinity of the site.*

The Site's existing permitted hours of operation (KCC Reg. Ref.: 07/267, Condition 14) are:

'Excavation and processing of material shall be carried out between 0800 hours and 1800 hours, Monday to Friday and between 0800 hours and 1300 hours on Saturdays. However, loading and transporting of processed material may be carried out between 0700 hours and 1800 hours: Monday to Friday and between 0700 hours and 1300 hours on Saturdays. No activities shall be permitted on Sundays or public holidays.'

The noise limits stated in Condition 33 correlate to those recommended by NG4 (see Section 9.2.3), which identifies typical limit values for noise from EPA licensed facilities as: Daytime (07:00 to 19:00) – 55 dB $L_{Ar,T}$; Evening (19:00 to 23:00) – 50 dB $L_{Ar,T}$; and Night-time (23:00 to 07:00) – 45 dB $L_{Aeq,T}$.

It is therefore proposed that the hours and limits stated in Condition 33 are maintained for the proposed continuation of extraction and processing at the Site.

9.3.1.2 Receptor Sensitivity

This assessment considers that human receptors, including residential properties, have a high sensitivity to noise and vibration. Glen Ding Wood to the southwest of the site has also been considered in the assessment and as woodland/amenity space, a medium sensitivity is assumed. Commercial and industrial receptors, comprising buildings and businesses, are considered to have a low sensitivity to noise and vibration and have been scoped out of further assessment.

The assumed sensitivity of identified representative existing NSRs are provided in Table 9-10.

Table 9-10: Sensitivity of Receptors

Receptor	Type of receptor	Sensitivity	Scoped In/Out
All existing dwellings (NSRs)	Human / residential	High	Scoped in
Glen Ding Wood	Woodland / amenity space	Medium	Scoped in
Business, agricultural	Commercial / industrial	Low	Scoped out

9.3.1.3 Evaluation Criteria

Appropriate criteria have been adopted for the derivation of noise impact magnitude resulting from the operation of the scheme. The criteria have been adapted from those provided within DMRB for construction phases of road schemes and which are considered to be appropriate for this evaluation. Table 9-11 details the resulting impact magnitude that have been applied.

Table 9-11: Quarry operational noise impact magnitude criteria

Exceedance of Threshold Value OR Change in Noise Level, dB $L_{Aeq,T}$	Subjective Response	Magnitude of Impact
≥5	Clearly perceptible	High adverse
≥3, <5	Perceptible	Medium adverse
>0, <3	Barely perceptible	Low adverse
≤0	Imperceptible	Negligible/no change

The criteria in Table 9-11 have been used to determine the significance of noise effects for receptors of different sensitivities, as shown in Table 9-12.

Table 9-12: Level of significance, relative to sensitivity of receptors

Magnitude of Impact	Level of Significance, Relative to Sensitivity of Receptor			
	Negligible	Low	Medium	High
High	Slight	Slight or moderate	Moderate or large	Profound
Medium	Imperceptible or slight	Slight or moderate	Moderate	Large or profound
Low	Imperceptible	Slight	Slight	Slight or moderate
Negligible	Imperceptible	Imperceptible or slight	Imperceptible or slight	Slight

9.3.1.4 Significance of Effect

A significant effect occurs where a medium or high impact is identified, but also subject to consideration of the following contextual factors:

- Absolute noise level;
- Proximity of sensitive receptors to the noise source
- Whether or not the impact changes the acoustic character; and
- Likely perception of change by residents.

For the purposes of this assessment, noise impacts that are determined to be large or profound are considered to be **significant** with impacts that are slight or moderate considered to be **not significant**.

9.3.1.5 Method of Baseline Noise Collation

Noise monitoring has been undertaken on Site at five noise monitoring locations over a period between April 2019 and January 2024. The surveys were conducted during daytime hours as night-time works are not conducted on the Site. The monitoring periods chosen are considered to be representative of typical daytime noise at each of the NSRs.

The following noise indices were recorded during each survey period:

- $L_{Aeq,T}$ – the equivalent continuous level is the constant noise level that would result in the same sound energy over a given period and is used to represent varying noise levels over a time, T, as a single number. Typically referred to as the 'ambient' noise level.
- $L_{A90,T}$ – the 'background' or 90th percentile noise level, i.e. the noise level that is exceeded for 90% of a time period, T. Representative of the quieter moments experienced at a location, this index is unaffected by short-duration noisy events.
- $L_{A10,T}$ – the 10th percentile noise level, i.e. the noise level that is exceeded for 10% of a time period, T. Typically used to characterise road traffic noise.
- $L_{Amax,T}$ – the maximum noise level recorded over a time, T.

Weather conditions during each survey were in accordance with the requirements of BS 7445, with no rain, and wind speeds below 5 m/s throughout.

Further information relating to noise monitoring is provided in Section 9.5.1.

9.3.1.6 Prediction of Noise Levels from Proposed Operations

Method of Prediction

A 3D model of the quarry was constructed within noise prediction software CadnaA and noise levels were predicted at the representative NSRs. The software enables prediction of noise levels under atmospheric conditions using the method in BS 5228-1.

BS 5228-1 provides a procedure for the estimation of construction noise levels, and for the assessment of the significance of the predicted effects at the receptors. Annex D of the Standard includes measured typical noise levels for a range of construction plant and activities.

Noise levels associated with the operation of the proposed facility have been predicted using CadnaA. The software supports the ISO 9613 and BS 5228 prediction methods. The model utilised the BS 5228 prediction method, which provides a more conservative prediction of noise propagation based on distance attenuation and ground absorption only.

A topographic survey of the study area was included within the model as a digital terrain map (DTM) to consider screening from topographic features, including the quarry void and walls, between the proposed working area and the closest sensitive receptors. The proposed future extent of the

quarry, including new quarry walls, was also incorporated into the model. The model considers the effect of ground conditions based on mixed ground conditions beyond the Site (G = 0.5) and no ground absorption of noise within the Site (G = 0), where G is the Ground Coefficient, which varies from 0 for hard ground, to 1 for ground covered by vegetation).

Working Scenarios for Noise Prediction

Both the current operational condition and future potential operational scenarios have been modelled. Modelling the current condition (based on topographical surveys undertaken in 2023) allows for direct comparison between predicted and measured noise levels.

Further details on the activities included within the model are provided below:

Current Operational Condition

The main activities currently experienced within the quarry, which would typically operate simultaneously on any given day, are as follows:

Main pit area:

- The processing of blasted rock; by rock-breaking, crushing and screening (using mobile equipment) and associated vehicle movements (excavators, loaders, road trucks etc.); and
- The extraction of sand and gravel by mechanical means, using excavators and haul trucks.

Surface activities at the eastern boundary of the site will include:

- The screening of sand and gravel by a fixed aggregate screening plant; and
- Associated vehicle movements including loaders, haul trucks, road trucks etc.

Future Operational Scenarios

Future scenarios will include the same activities as currently experienced but at new locations within the proposed pit extensions as follows:

Southern pit extension

- The processing of blasted rock; by rock-breaking, crushing and screening (using mobile equipment) and associated vehicle movements (excavators, loaders, road trucks etc.); and
- The extraction of sand and gravel by mechanical means, using excavators and haul trucks.

Northern pit extension (to occur during the latter phases of the project, see Chapter 2, Project Description):

- The extraction of sand and gravel by mechanical means, using excavators and haul trucks.

Surface activities (screening and loading vehicles) will be unchanged.

Based on these operations and the project phasing, the current operational condition and three future noise prediction scenarios have been developed and assessed as follows:

- Existing operational condition: processing of blasted rock towards centre of main pit; extraction of sand/gravel in southern and western areas of main pit; surface activities at eastern boundary of site.

- Future Scenario 1: processing of blasted rock in most southerly extent of southern pit extension; extraction of sand/gravel in most southerly extent of southern pit extension only; surface activities as existing at eastern boundary of site.
- Future Scenario 2: processing of blasted rock in most southerly extent of southern pit extension; extraction of sand/gravel shared between most southerly extent of southern pit extension and westerly extent of southern pit extension; surface activities as existing at eastern boundary of site.
- Future Scenario 3: processing of blasted rock in most southerly extent of southern pit extension; extraction of sand/gravel shared between most southerly extent of southern pit extension and most northerly extent of northern pit extension; surface activities as existing at eastern boundary of site.

Topsoil and Overburden

Topsoil and overburden will be stripped from the Application area in phases. The stripping will occur infrequently at the Site and for short durations. Therefore, soil stripping has not been included within the assessment.

Conservatism in Predicted Scenarios

A conservative approach has been taken in carrying out the predicted scenarios. The void is considered at its maximum extent, therefore modelling has been carried out using scenarios where all mobile plant were placed at the closest area of the Site to the relevant receptors. It should be noted that these work practices would be very unlikely to occur in close proximity at such a location.

The predicted noise levels assume a receptor height of 4 m above local ground level, (representative of a first-floor bedroom window). This is a robust approach, which minimises the attenuation due to ground absorption and potential screening from the quarry face. Predicted noise levels at the height of a person standing at ground level, (e.g., effective receptor height of 1.5 – 1.8 m) will be lower.

The modelling has assumed that the majority of fixed plant operates with a 90 % equipment 'on-time' (based on a 10 hr working day with 1 hr lunch break), with the exception of a rock breaker which is used, on average, for 50 % of the day and a telehandler in the surface plant area which is used for around 40 % of the day.

Embedded Mitigation Assumed within Model

The following mitigation embedded into the design of the proposed scheme has been incorporated within the noise model:

- A stand-off distance of approximately 150 m from the northern boundary of the proposed site extension to the nearest NSR; and
- An earth bund 6 m above ground level along the northern boundary of the proposed site extension.

Operational Plant for Prediction

A list of operational plant has been provided by the operator and is summarised in Table 9-13, below. The stated sound power levels of the surface fixed screen and generator were derived from on-site measurements; mobile plant sound power levels are as stated by the manufacturer, where

available; all other plant sound power levels were based data provided in BS 5228 for equivalent plant. In each case, the octave band spectral shape was based on data within BS 5228.

Table 9-13: Operational plant and noise modelling assumptions applied

Item	Sound Power Level, dB L_{WA}	Spectral Shape, from BS5228-1:2009+A1:2014	Relative Height Above Ground, m
Point sources: Plant associated with extraction works			
Excavator with rock breaker	121.0(1)	BS_5228_2009_C9_11	4
Mobile crusher 1	118.1(1)	BS_5228_2009_C9_14	3
Mobile crusher 2	118.1(1)	BS_5228_2009_C9_14	3
Mobile screen 1	109.1(1)	BS_5228_2009_C10_15	3
Mobile screen 2	109.1(1)	BS_5228_2009_C10_15	3
Excavator 1 (working with crusher)	114.5(1)	BS_5228_2009_C6_5	1.5
Excavator 2 (working with crusher)	107.0(2)	BS_5228_2009_C6_6	1.5
Loader 1 (working in pits)	109.0(2)	BS_5228_2009_C9_27	1.5
Loader 2 (working in pits)	108.0(2)	BS_5228_2009_C9_27	1.5
Face shovel (loading sand and gravel)	116.5(1)	BS_5228_2009_C6_2	6
Excavator (loading sand and gravel)	107.0(2)	BS_5228_2009_C6_6	1.5
Point sources: Plant associated with aggregate plant			
Surface fixed screen	116.3(3)	BS_5228_2009_C10_15	6
Generator	107.0(3)	BS_5228_2009_C4_87	1.5
Loader 1	109.0(2)	BS_5228_2009_C9_27	1.5
Loader 2	109.0(2)	BS_5228_2009_C9_27	1.5
Loader 3	109.0(2)	BS_5228_2009_C9_27	1.5
Truck loading activities (site wide, pit and surface)	112.9(1)	BS_5228_2009_C10_11	4
Excavator	100.0(2)	BS_5228_2009_C6_9	1.5
Telehandler	109.9(2)	BS_5228_2009_C4_55	3
Line sources: Material movement around site			
Dumpers (3 x Volvo A40Fs)	104.8(2)	BS_5228_2009_C6_26	1
Dumpers (Komatsu HD785s)	112.6(1)	BS_5228_2009_C9_16	1
Road trucks	111.1(1)	BS_5228_2009_C11_4	1

(1) Derived from BS5228 equivalent
(2) Stated by manufacturer
(3) Derived by measurement at site

Predicted Operational Scenarios

Current operational condition

Extraction works in the pit

- 1 no. face shovel and 1 no. excavator excavating sand and gravel in the pit and loading haul trucks;
- 1 no. excavator and 1 no. rock breaker at a recently blasted face near the centre of the pit
- 2 no. excavators feeding one mobile crusher at each of two locations within the pit;
- 2 no. mobile screening units being fed by each mobile crusher at the two locations identified above;
- 2 no. loaders working in quarry base, loading road trucks and conducting general stockpiling duties from the screens;

Aggregate plant operating on surface

- Generator adjacent to the aggregate plant;
- 1 no. fixed surface screen;
- 3 no. Volvo L220G loaders working at the aggregate plant loading road trucks and conducting general stockpiling duties from the fixed screen;
- 1 no. loading truck;
- 1 no. Komatsu PC210 excavator working at the aggregate plant loading materials;
- 1 no. Caterpillar H83 telehandler carrying out various duties around the surface plant area ('on-time' of 240 minutes per day)

Haul routes

- 3 no. Volvo A40F haul trucks and 1 no. Komatsu HD785 moving sand and gravel to the aggregate plant on the surface;
- Road trucks exporting materials from site at a frequency of 26 movements per hour (13 road trucks in and 13 road trucks out).

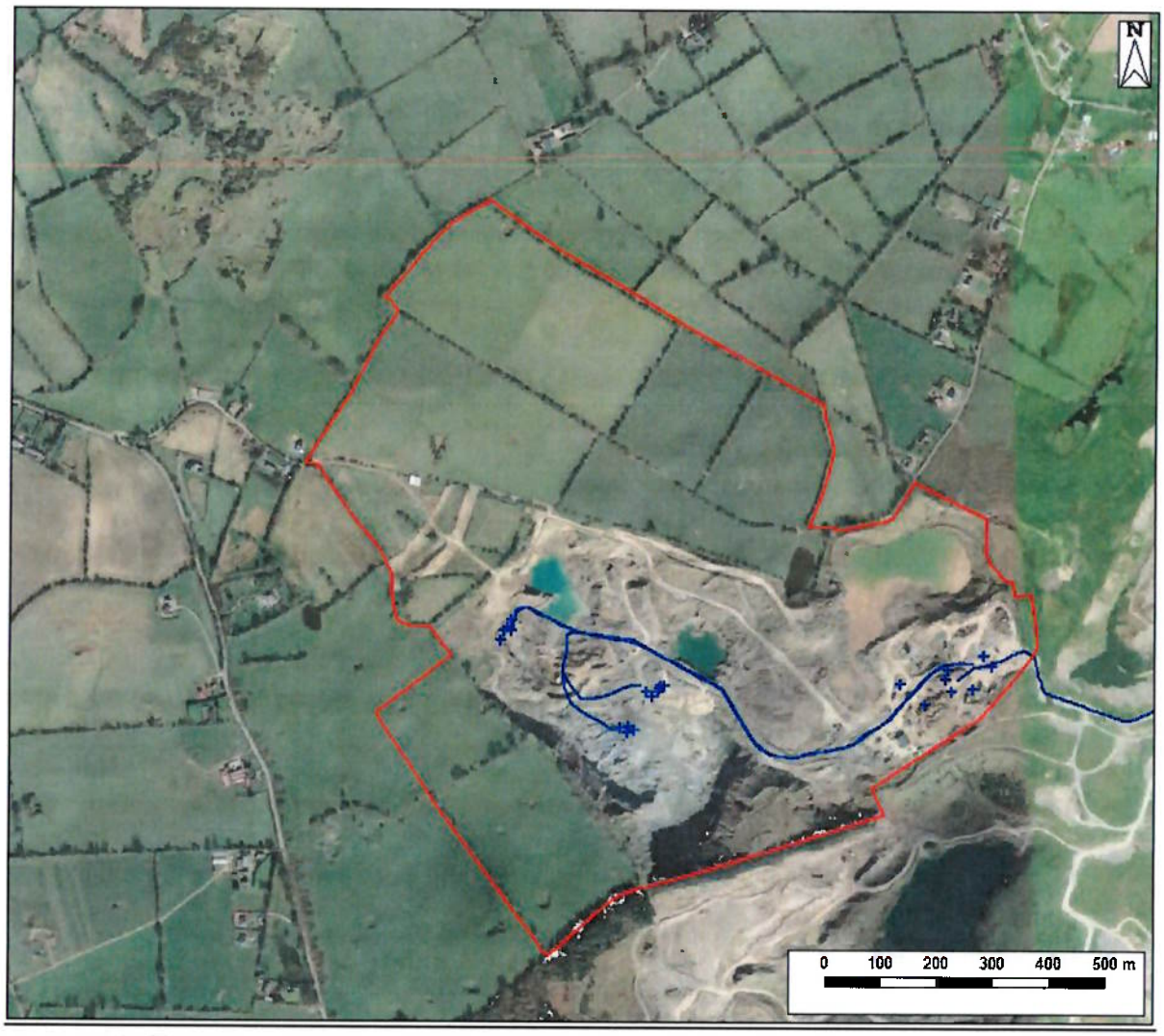

Figure 9-3: Existing operational condition inputs and plant locations

Scenario 1 – all extraction works in southwest pit

In Scenario 1, all plant associated with extraction is located within the proposed southwest pit extension. Plant associated with screening activities is located at the site's eastern boundary. Plant have been located at the extremity of the pit void so that they are at the closest working location to the closest receptors.

The predicted inputs for this scenario include the activities of the fixed and mobile equipment detailed below with locations relative to the current site extents identified in **Figure 9-4**.

Proposed southwest pit extension

- 1 no. face shovel and 1 no. excavator excavating sand and gravel in the pit and loading haul trucks;
- 1 no. excavator and 1 no. rock breaker at a recently blasted face in the southern corner of the pit closest to NSR refs. R13, R14 and R15;
- 2 no. excavators feeding one mobile crusher at each of two locations within the pit;

- 2 no. mobile screening units being fed by each mobile crusher at the two locations identified above;
- 2 no. loaders working in quarry base, loading road trucks and conducting general stockpiling duties from the screens.

Aggregate plant operating on surface

- Generator adjacent to the aggregate plant;
- 1 no. fixed surface screen;
- 3 no. Volvo L220G loaders working at the aggregate plant loading road trucks and conducting general stockpiling duties from the fixed screen;
- 1 no. loading truck;
- 1 no. Komatsu PC210 excavator working at the aggregate plant loading materials;
- 1 no. Caterpillar H83 telehandler carrying out various duties around the surface plant area.

Haul routes

- 3 no. Volvo A40F haul trucks and 1 no. Komatsu HD785 moving sand and gravel to the aggregate plant on the surface;
- Road trucks exporting materials from site at a frequency of 26 movements per hour (13 road trucks in and 13 road trucks out).

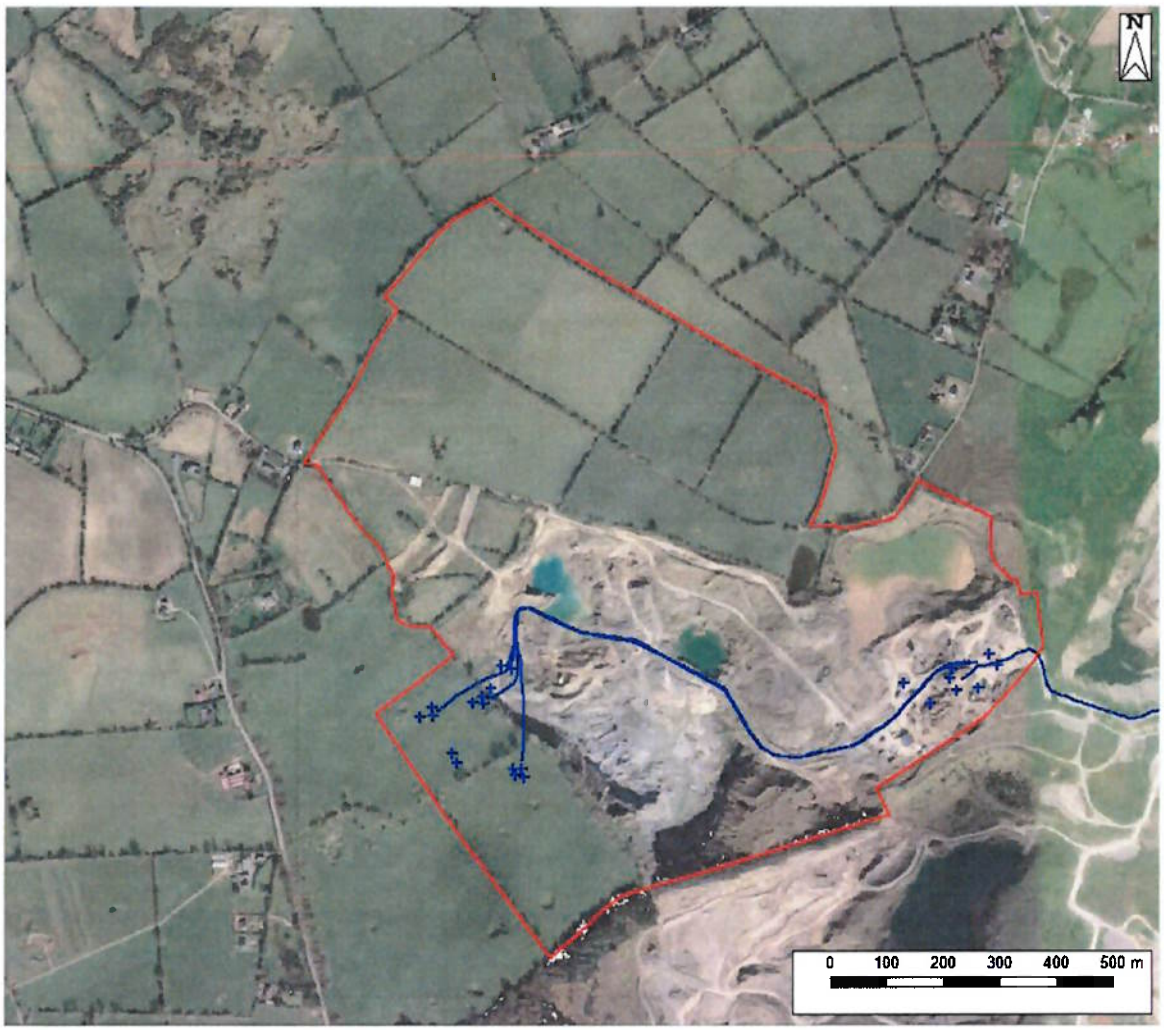

Figure 9-4: Scenario 1 inputs and plant locations

Scenario 2 – extraction works in southwest pit: sand and gravel extraction in northern section of southern pit

This scenario is similar to Scenario 1 described above, but the workings of sand and gravel in the extension area have progressed into the northern section of the southern pit. Plant have been located at the extremity of the pit void so that they are at the closest working location to the closest receptors.

The predicted inputs for this scenario include the activities of the fixed and mobile equipment detailed below with locations relative to the current site extents identified in **Error! Reference source not found.**. All plant has an on-time of 100 % unless otherwise stated.

Proposed southwest pit extension

- 1 no. excavator and 1 no. rock breaker at a recently blasted face in the southern corner of the pit closest to NSR refs. R13, R14 and R15;
- 2 no. excavators feeding one mobile crusher at each of two locations within the pit;
- 2 no. mobile screening units being fed by each mobile crusher at the two locations identified above;
- 2 no. loaders working in quarry base, loading road trucks and conducting general stockpiling duties from the screens.

Northern extent of proposed southwest pit extension

- 1 no. face shovel and 1 no. excavator excavating sand and gravel in the pit and loading haul trucks.

Aggregate plant operating on surface

- Generator adjacent to the aggregate plant;
- 1 no. fixed surface screen;
- 3 no. Volvo L220G loaders working at the aggregate plant loading road trucks and conducting general stockpiling duties from the fixed screen;
- 1 no. loading truck;
- 1 no. Komatsu PC210 excavator working at the aggregate plant loading materials;
- 1 no. Caterpillar H83 telehandler carrying out various duties around the surface plant area.

Haul routes

- 3 no. Volvo A40F haul trucks and 1 no. Komatsu HD785 moving sand and gravel to the aggregate plant on the surface;
- Road trucks exporting materials from site at a frequency of 26 movements per hour (13 road trucks in and 13 road trucks out).

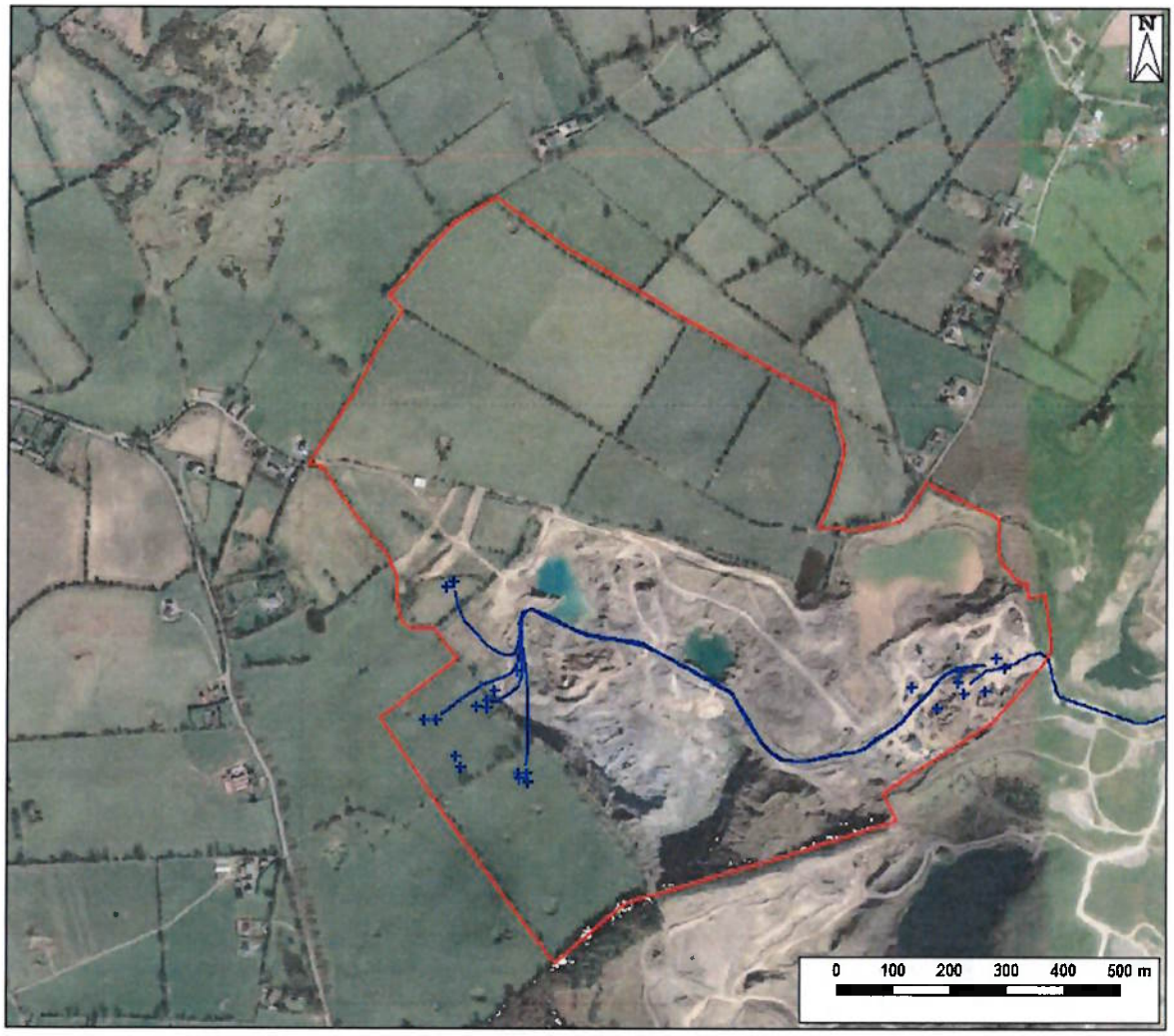

Figure 9-5: Scenario 2 inputs and plant locations

Scenario 3 – extraction works in southwest pit; sand and gravel extraction in northern pit extension

This predicted scenario is similar to Scenario 2 described above, but the workings of sand and gravel have progressed to the northern pit, which represents the latter phases of the proposed development. Plant have been located at the extremity of the pit void so that they are at the closest working location from the sensitive receptors.

The predicted inputs for this scenario include the activities of the fixed and mobile equipment detailed below with locations relative to the current site extents identified in **Figure 9-6**. All plant has an on-time of 100 % unless otherwise stated.

Proposed southwest pit extension

- 1 no. excavator and 1 no. rock breaker at a recently blasted face in the southern corner of the pit closest to NSR refs. R13, R14 and R15;
- 2 no. excavators feeding one mobile crusher at each of two locations within the pit;
- 2 no. mobile screening units being fed by each mobile crusher at the two locations identified above;

- 2 no. loaders working in quarry base loading road trucks and conducting general stockpiling duties from the screens.

Proposed northern pit extension

- 1 no. face shovel and 1 no. excavator excavating sand and gravel in the pit and loading haul trucks.

Aggregate plant operating on surface

- Generator adjacent to the aggregate plant;
- 1 no. fixed surface screen;
- 3 no. Volvo L220G loaders working at the aggregate plant loading road trucks and conducting general stockpiling duties from the fixed screen;
- 1 no. loading truck;
- 1 no. Komatsu PC210 excavator working at the aggregate plant loading materials;
- 1 no. Caterpillar H83 telehandler carrying out various duties around the surface plant area.

Haul routes

- 3 no. Volvo A40F haul trucks and 1 no. Komatsu HD785 moving sand and gravel to the aggregate plant on the surface;
- Road trucks exporting materials from site at a frequency of 26 movements per hour (13 road trucks in and 13 road trucks out).

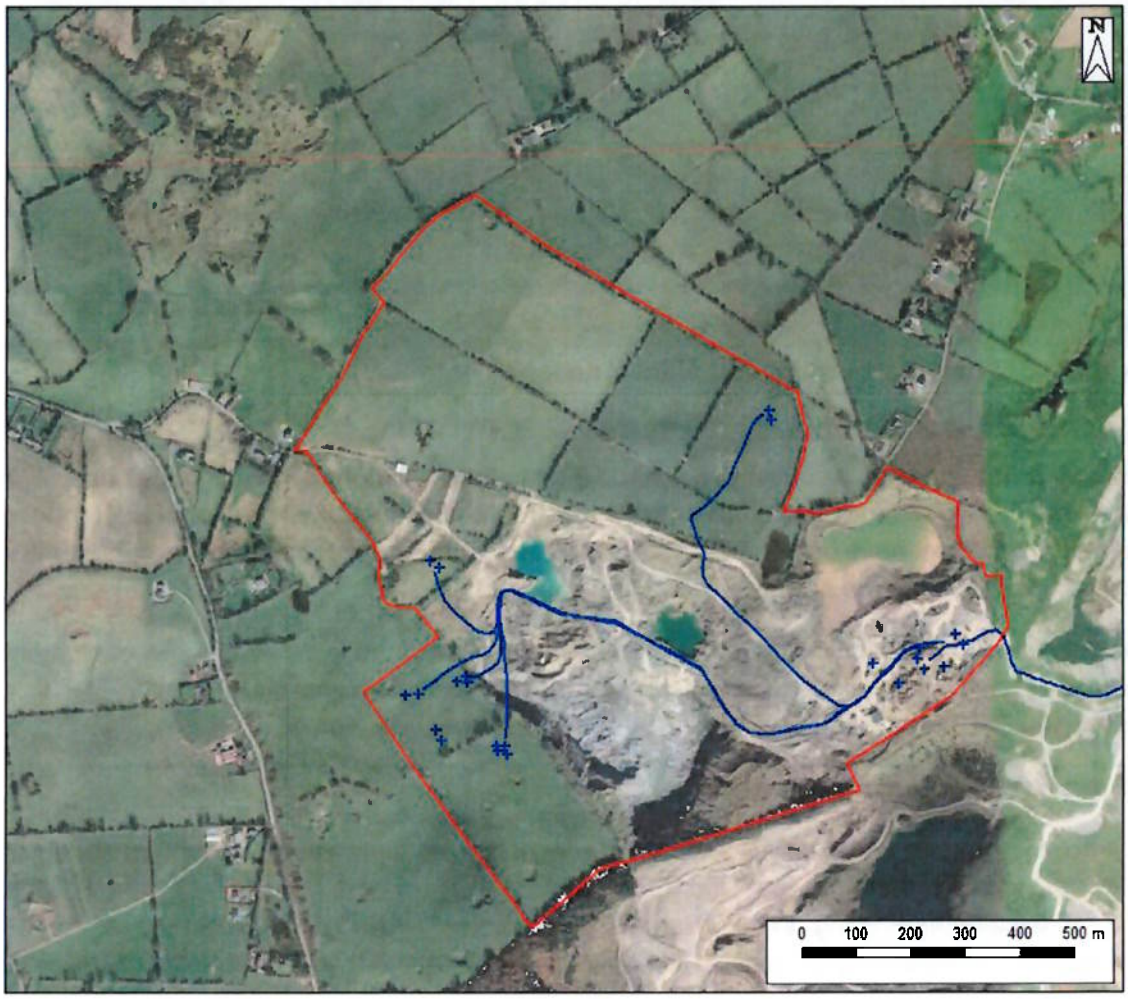

Figure 9-6: Scenario 3 inputs and plant locations

9.3.2 VIBRATION IMPACT ASSESSMENT

9.3.2.1 Introduction

The most significant potential source of ground borne vibration that could be generated by the proposed operations at the quarry is the extraction of rock from the active face. Rock extraction requires the use of a pneumatic rock breaker and blasting.

In addition to ground borne vibration, energy is transmitted from the blast site in the form of airborne pressure waves. These pressure waves occur over a wide range of frequencies, some of which are audible, some of which are not. The audible component is generally perceived as a loud bang; the inaudible component can be sensed as a change in pressure, or concussion. The combination of sound and concussion is referred to as air overpressure (AOP).

In order to characterise potential vibration impacts at the closest receptors, monitoring has been undertaken by a blasting contractor during blasting activities at the closest vibration sensitive receptors to the northeast and southwest boundaries of the quarry.

Measured vibration levels have been assessed according to British Standard BS 7385:1990 Parts 1 and 2.

9.3.2.2 Blast Measurement Parameters

The following terminology is specific to vibration and overpressure:

- Ground borne vibration at sensitive receptors is measured as Peak Particle Velocity (PPV) in mm/s. The PPV is the maximum instantaneous velocity of a particle at a point during a given time interval.
- AOP has a strong low frequency component and for this reason it is measured in linear decibels, dB(lin), rather than with an A-weighting, dB(A).

9.3.2.3 Evaluation Criteria

Vibration limits from blasting are recommended in DEHLG (now DCCAE)s, EPA and ICF Environmental Guidelines. The vibration limit from blasting should not exceed a peak particle velocity of 12 mm/s when measured in any three mutually orthogonal planes at a receiver location when blasting occurs at a frequency of once per week or less.

The acceptable vibration and air overpressure limits at sensitive receptors in Ireland are 12 mm/s (PPV) and 125 dB(lin) AOP as defined in the EPA management guidelines.

9.3.2.4 Impact Magnitude Criteria

Based on the evaluation criteria provided in Table 9-5 and the permitted vibration limits described above, the following magnitude of impact criteria and significance of effect at the nearest sensitive receptors identified in Table 9-14 have been adopted for blasting during the day.

Table 9-14: Quarry blasting vibration impact magnitude criteria

Quarry Blasting Vibration (x) in PPV, mm/s	Magnitude of Impact
x < 6.0	Negligible to low
6.0 < x < 12.0	Low to medium
x > 12.0	Medium to high

9.3.2.5 Significance of Effect

9.3.3 A significant effect occurs where a medium or high magnitude of impact is identified, but also subject to consideration of the following contextual factors:

- Absolute vibration level;
- Proximity of sensitive receptors to the blasting site;
- Number of blasts in a day; and
- Likelihood of damage to a property as a result of vibration or air overpressure.

9.3.4 CONSTRUCTION PHASE

Future construction phase quarry works will consist of stripping the top and subsoils to expose the rock reserve and will be of relatively short-term duration. The construction of the screening banks around the quarry will, upon completion, provide effective attenuation to noise generated by site activities. Noise levels associated with any future construction phase activities will be controlled via the application of best practicable means (BPM) in accordance with methods provided in BS 5228.

Appropriate construction phase noise limits, which are presented in Table 9-15 (NRA Guidelines, 2004) represent a reasonable compromise between the practical limitations in a construction project, and the need to ensure an acceptable noise level for the nearby residents. In addition to the standard workday criterion of 70 dB(A), the guidelines specify a reduced limit of 65 dB(A) for work on Saturdays, and 60 dB(A) for evening periods, and Sundays and bank holidays.

Table 9-15: Construction phase noise limit values

Period	Times	Ambient Level, dB $L_{Aeq,1hr}$	Maximum Level, dB L_{Amax}
Monday to Friday	07:00 to 19:00	70	80
Monday to Friday	19:00 to 22:00	60	65
Saturday	08:00 to 16:30	65	75
Sundays and Bank Holidays	08:00 to 16:30	60	65

9.4 BASELINE CONDITIONS

This Section presents a summary of the baseline conditions and detailed information about conditions on and surrounding the Site.

9.4.1 SITE SETTING

The Site is on lands at Athgarrett, Philipstown and Redbog, Red Lane, Co. Kildare, along the Kildare/Wicklow border. Access to the Site is via the N81 National Road, and through the Hudson Brothers Limited Wicklow site, to the southeast. Regionally, the nearest town is Blessington, which is located approximately 2 km to the south of the Site. Beyond this there are several other small towns and the suburbs of Dublin.

The Red Bog SAC is located approximately 257 m northeast of the Site and is a similar elevation (approximately 260 mAOD), to the highest point within the Site.

Three main land uses have been identified within the Site and the study area (500 m from the Site boundary). These are the agricultural and single-house residential lands, the R410 road and other quarry operations. The lands to the north and west can be characterised as rural in nature, with land uses in the area being agricultural and single-house residential. Sheep rearing and grazing of cattle are the main activities in the area. The R410 road passes through the 500 m buffer to the southwest of the Site and the lands immediately to the east and south of the Site are largely taken up by quarrying activities operated by unrelated parties.

9.4.2 SITE LAYOUT

A detailed description of the Site layout and infrastructure is presented in Chapter 2.0 (Project Description). Only key information relevant to the water environment is detailed below.

The Site comprises lands which are currently used for quarrying activities. The Site is comprised of different areas which include: a northeastern area with buildings, parking and storage areas; an eastern plant area with the processing plant used for the screening and washing of excavated sand and gravel material and a water treatment plant; a southern area where sediment laden water from processing is pumped to settle in a silt pond; a central area where and gravel, and rock material is subject to extraction.

9.4.3 SITE TOPOGRAPHY

The Site sits within a valley that slopes to the northwest and is shouldered by a high peak (at ca. 346 m AOD) to the north of the Site and Red Bog SAC, and a smaller peak to the south of the Site, in the area of Glen Ding Wood and Deer Park Plantation (at ca. 286 mAOD).

The Site is on the northwestern side of a saddle between the two peaks. On the southeastern side of the saddle are the adjacent quarries and the topography slopes down towards Blessington town and the Poulaphouca Reservoir.

The topography at the Site boundary peaks at ca. 271 mAOD and ca. 264 mAOD in the northeastern and southeastern corners respectively and drops to a low of ca. 205 mAOD on the western boundary.

9.4.4 OVERVIEW OF CURRENT OPERATIONS

Sands and gravels are extracted at the operational face by mechanical means and are transported by haul truck to a fixed processing plant in the plant area located in the eastern part of the Site. Processed sand and gravel are stockpiled adjacent to the aggregate plant prior to being transferred to road going trucks via a mobile loader and are then transported to market.

Rock material is currently extracted from active rock faces by an excavator with a rock braker attachment. Prior to September 2020 rock was extracted via blasting with some use of the rock braker on oversize materials. Rock is then processed on the quarry floor by mobile crushing, screening, and associated plant before being stockpiled into specific graded aggregate stockpiles. Crushed rock aggregate is then loaded into road going trucks for transport to market.

9.5 NOISE AND VIBRATION MONITORING

9.5.1 NOISE MONITORING

9.5.1.1 Measurement Methodology

Noise monitoring was undertaken by suitably competent personnel using sound measuring equipment rated Class 1 to IEC 61672-1:2013 and with a current UKAS Certificate of Calibration. Each noise monitoring survey occurred during a typical weekday period when the quarry was operational and consisted of a 30-minute (and most recently, 60-minute) measurement of the ambient noise level at each measurement location. Surveys took place during periods when the weather was suitable and appropriate (i.e. dry with wind speeds <5m/s).

9.5.1.2 Noise Monitoring Locations

The noise monitoring locations adopted in the site's routine surveys have been located at the closest NSRs or at a location closer to the development to be representative of a number of NSRs in that area. The coordinates of these noise monitoring locations are presented in Table 9-16 displayed in Figure 9-7.

Table 9-16: Coordinates of noise monitoring locations

Name	Coordinates (m) – Irish National Grid		
	Easting (X)	Northing (Y)	Height (Z)
N1K	296403	216266	221
N2K	296454	216972	206
N3K	296748	217396	238
N4K	297514	216917	269
N5K (not an NSR)	297504	216344	229

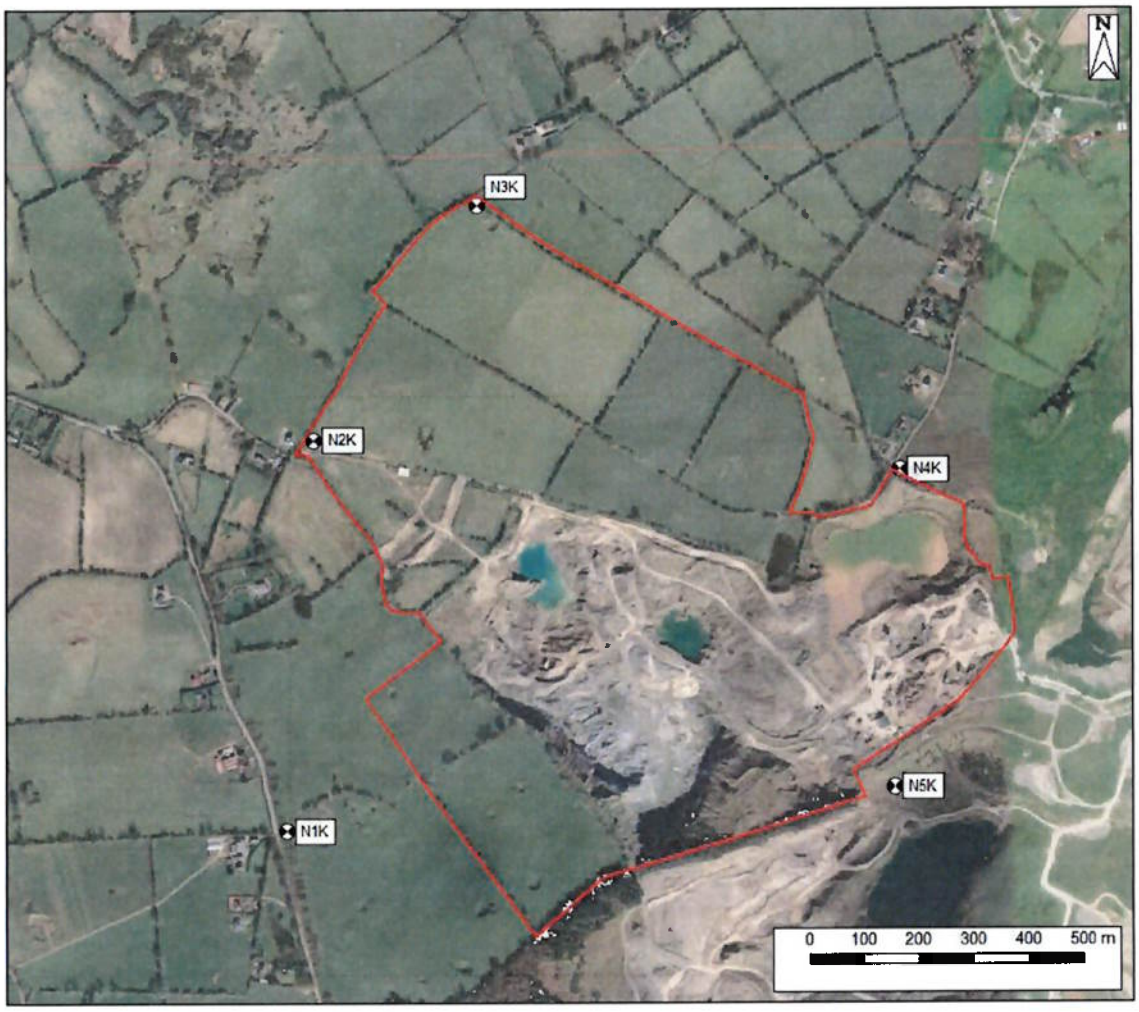

Figure 9-7: Noise monitoring locations

9.5.1.3 Noise Monitoring Equipment

The sound measuring equipment utilised for noise monitoring is detailed in Table 9-17 below. The sound level meter was mounted on a tripod at a height of 1.2 – 1.5 m above ground level for each measurement. Calibration checks were carried out on the sound level meter prior to and on completion of the survey with no significant calibration drift (i.e. drift in excess of 0.1dB) noted.

Table 9-17: Equipment used during noise monitoring

Equipment	Make and Model	Serial Number
Sound level meter	Norsonic 140	1402742
Pre-amplifier	Norsonic 1209	12131
Microphone	Norsonic 1225	72926
Calibrator	Norsonic 1251	33002
Calibrator	Norsonic 1251	31525

All sound measurement equipment is certified Class 1 to IEC 61672-1:2013 and holds a current UKAS Certificate of Calibration with sound level meters having undergone UKAS calibration within the previous two years and calibrators within the previous 12 months.

Noise levels attributable to the quarry operations were monitored and compared with the existing permitted limits.

9.5.1.4 Noise Monitoring Results

A summary of the noise monitoring results obtained between from April 2019 and January 2024 are presented in Table 9-18 below, with detailed results in Appendix 9B.

Table 9-18: Summary of noise monitoring results, April 2019 – January 2024

Monitoring Location	No. of Measurements	Daytime Limit, dB L_{Aeq}	Log-average dB $L_{Aeq,T}$	Exceedance of Daytime Limit, dB	Range dB $L_{Aeq,T}$	Range dB L_{A10}	Range dB L_{A90}
N1K	16	55.0	61.3	6.3	50.5 - 66.4	54.3 - 71.8	32.7 - 49.8
N2K	16	55.0	50.1	-4.9	39.1 - 59.1	41.2 - 51.8	30.9 - 42.7
N3K	16	55.0	46.3	-8.7	34 - 51.4	35.4 - 54.2	27.4 - 45.1
N4K	17	55.0	47.1	-7.9	39.1 - 50.4	39.6 - 52.2	34.1 - 47.4
N5K	17	55.0(1)	51.8	-3.2	41.0 – 60.0	42.4 - 62.6	35.1 - 54.8

(1) Whilst N5K is not a noise sensitive receptor, the measured noise levels have been evaluated against the same criteria for comparative purposes

The quarry was in full operation during each noise monitoring period. Crushing and screening operations were underway on the pit floor, mobile plant (such as loaders, excavators and dump trucks) were active around the site outside the pit and road trucks were being loaded for exportation of aggregate. Rock breaking was being undertaken intermittently during the surveys. The surface aggregate screen was also fully operational during each survey.

9.5.1.5 Comments on Existing Noise Conditions

The results of the noise survey are typical of the levels expected for a rural environment which is not significantly influenced by a continuous or dominant noise source. In general, the main noise sources noted are intermittent passing traffic on adjacent roadways the R410 and the N81 to the west and east of the Site. Activities within the quarry site were audible at low levels, in addition to activities in the adjacent quarries which were also audible intermittently during the surveys.

N1K – This location is directly adjacent to the regional R410 road, which was the dominant noise source during the noise surveys. During lulls in road traffic, the quarry was faintly audible in the distance. No impulsive noise sources from the Site were observed during the survey. During some surveys the quarry operations were not noted at all during lulls in road traffic. Other audible noise sources included: birdsong, nearby treeline blowing in gusts of wind. This treeline along the R410 was felled prior to the March 2020 monitoring event. No tonal noises were audible on site during the surveys or identified in the resultant data.

N2K - The dominant noise sources at this receptor were identified to be birdsong (intermittently audible but dominant) and quarrying activities to the south-east. Intermittent noise sources included: construction machinery to the north-west, planes overhead, rock breaking equipment to the south-east (within the quarry at a low level), activities in adjacent properties, noise within an adjacent

treeline and dogs barking adjacent to the monitoring location. No tonal noises were audible on site during the surveys or identified in the resultant data.

N3K – The dominant noise sources at this receptor were quarrying activities within the Site, consisting of engines and aggregate screening activities in the pit (noted to be at a low level and below the threshold but were the dominant noise source on occasions). Other audible noise sources included: construction activities on an adjacent house, sheep in the adjacent field, rustling in the treeline and birdsong. Other intermittent noise sources included aircraft overhead and reversing alarms on site. No distinctive tonal noises were identified in the resultant data.

N4K – The dominant noise sources at this receptor were quarrying activities within the Site, mainly aggregate screening. Birdsong was also noticeably audible. Other intermittently audible noise sources included: activities in a dwelling north of the monitoring location, dogs barking, construction activities on a nearby house, cars on an adjacent public road, voices in an adjacent house and airplanes overhead. No tonal noises were audible on site during the surveys or identified in the resultant data.

N5K – This location is not representative of a noise sensitive receptor but has been historically monitored at the site to provide a geographic spread of monitoring locations around the site's perimeter. The dominant noise sources at this receptor were quarrying activities in the adjacent quarry to the south (excavators, dump-trucks, screeners and crushers). Due to the topography and screening berm, the surface screen to the north was faintly audible on occasion. Other intermittent noise sources included: aircraft and helicopters, sound from screening plant in the neighbouring quarry, birdsong. No tonal noises were audible on site during the surveys or identified in the resultant data.

9.5.1.6 Exceedances During the Noise Monitoring Surveys

It can be seen in both the monitoring data in Appendix 9B and the summary in Table 9-18 that the individual L_{Aeq} noise levels at location N1K frequently exceeded the 55 dB $L_{Aeq,T}$ noise limit, with the overall logarithmically averaged level being 61 dB $L_{Aeq,T}$. Location N1K is situated off-site and adjacent to a public road, (R410, Blessington/Naas road). Due to the proximity of traffic passing the location it may be appropriate to consider the L_{A90} sound levels when assessing the magnitude of noise in the absence of road traffic. The L_{A90} is the sound level exceeded for 90% of the measurement period, is less affected by intermittent sounds (such as passing traffic) and is often used to quantify the background sound level. It can be seen that at this location the L_{A90} values were in the range of 33-50 dB $L_{A90,T}$ during the monitoring periods. This would suggest that in the absence of contributions from passing traffic, the permitted daytime limit of 55 dB $L_{Aeq,T}$ would be achieved.

One exceedance was also noted at N2K during the March 2020 survey. During this monitoring period, it was noted that the exceedance was due to off-site noise sources, namely a bough of a tree in an adjacent hedge row which was loose and squeaking loudly. The Site was audible at this location, but at a low level. The L_{A90} sound level for this monitoring event measured 34 dB $L_{A90,30min}$ and it is therefore considered that noise levels associated with the Site would also be compliant with the permitted noise limit.

Exceedances above the daytime noise limit noted at N5K have been attributed to noise from the processing plant and other quarry related activities. As noted previously, this location is not representative of a noise sensitive receptor and as the logarithmically averaged sound level from all

survey periods at this location was determined to be 52 dB $L_{Aeq,T}$, the Site was still in compliance with the permitted noise limits.

9.5.2 VIBRATION MONITORING

9.5.2.1 Introduction

Vibration and AOP monitoring of quarry blasting has been undertaken on Site at five vibration monitoring locations over a period between February 2018 and August 2020. No blasting has taken place at the Site since August 2020 so no data is available after this time. The surveys were conducted by the blasting contractor using monitoring equipment provided by the contractor during daytime periods only when blasting was taking place.

9.5.2.2 Blast Monitoring Locations

During each blasting event at the existing quarry both ground vibration and air overpressure are monitored at the closest sensitive locations (i.e., the locations nearest to the blast). The blast monitoring locations vary for each blast.

The coordinates of these monitoring locations are presented in Table 9-19 and displayed in Figure 9-8.

Table 9-19: Coordinates of blast monitoring locations

Name	Coordinates (m) – Irish National Grid		
	Easting (X)	Northing (Y)	Height (Z)
V1	297505	216953	269
V2	296182	216693	211
V3	296262	216552	216
V4	296233	216950	202
V5	297855	217504	278

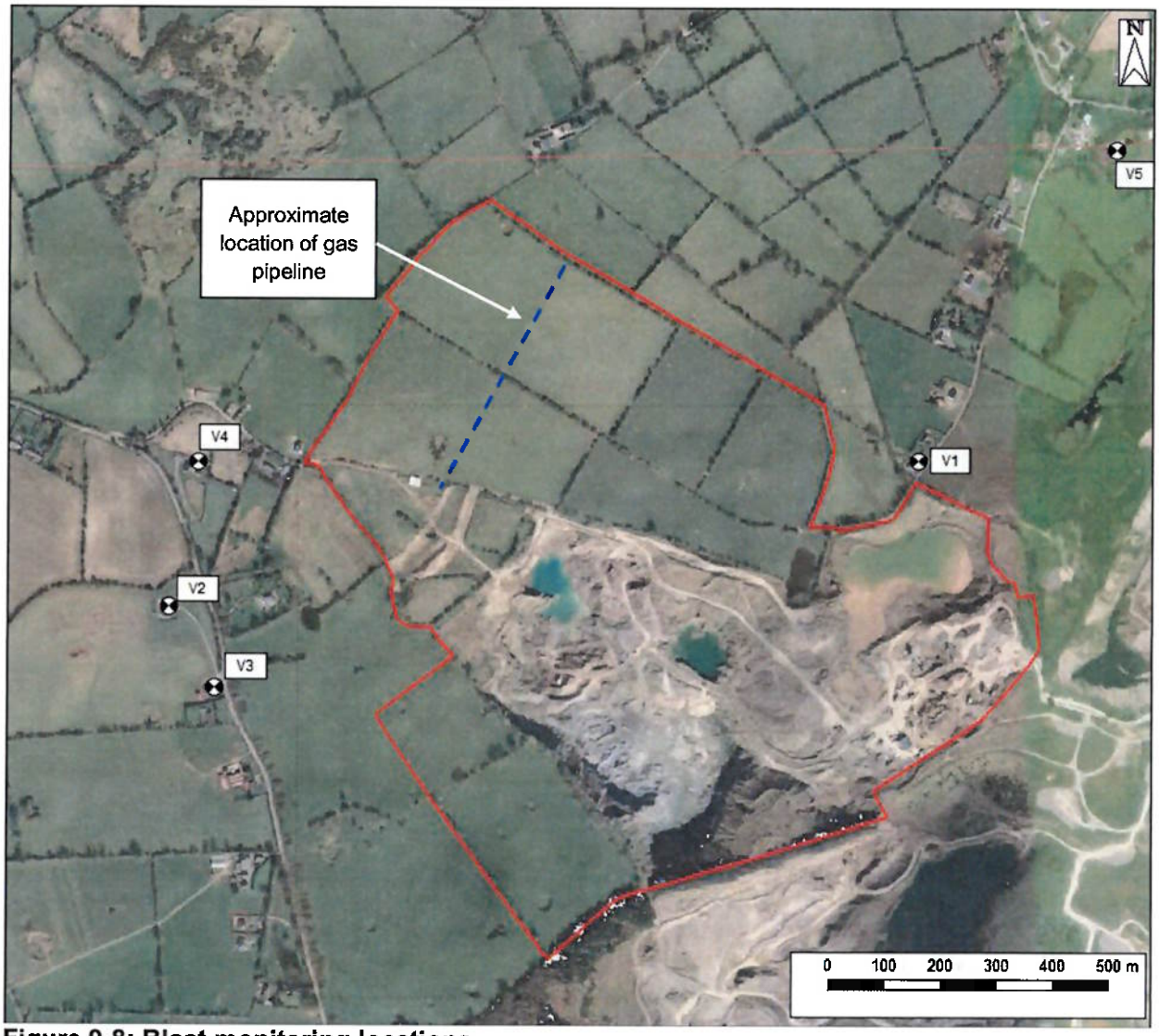

Figure 9-8: Blast monitoring locations

9.5.2.3 Gas Networks Ireland (GNI) Pipeline

A GNI transmission line lies to the northwest of the existing quarry, running in an approximate northeast to southwest direction, as identified in Figure 9-8.

There is the potential for an improperly managed blast to damage the gas transmission line. Fractures in the line could result in gas leaks and an explosion. The loss of gas transmission would result in further indirect effects elsewhere on the line.

The blasted rock face of the quarry is ca. 370 m from the gas transmission line. As the proposed quarry extension progresses westwards, the blasting activities will occur nearer to the transmission line. However, the closest blasted face will be located ca. 315 m away from the line at its closest point. The GNI 2015 'Code of Practice for Working in the Vicinity of the Transmission Network' dictates that: 'blasting shall not be permitted within 400 metres of a transmission network without consulting GNI and making an assessment of the vibration levels at the pipeline'. HBL have liaised with GNI on this matter and a site visit has been conducted by GNI.

In order to mitigate and reduce the potential of damage to the gas transmission line, numerous mitigation measures are employed during blasts, as identified in Section 9.7.2. These measures include a number of operational controls and also the requirement for blasting contractors to be trained and competent.

HBL deploy a vibration monitor at the gas transmission line during all blasting events. From these monitoring records the blasting contractor can determine whether the MIC or methods need to be altered for future blasting events. .

9.5.2.4 Blast Monitoring Results

A summary of the vibration and AOP monitoring, indicating the highest measured PPV and AOP at each blast monitoring location, is provided in Table 9-20 below, with full results in Appendix 9C.

Table 9-20: Summary of highest measured vibration PPV and AOP during blasting

Location of Seismograph	No. of Measurements at Location	Distance from Blast (m)	Relative Position to Blast (degrees)	Highest Measured AOP, dB(lin) Limit: 125 dB(lin)	Highest Measured PPV, mm/s Limit: 12 mm/s		
					Transverse	Vertical	Horizontal
Gas pipeline	7	317	95	120.1	6.00	2.50	4.06
V1	30	656	250	124.8	2.20	1.80	1.80
V2	26	820	118	114.4	1.20	0.89	1.40
V3	16	690	73	113.1	2.20	1.80	2.00
V4	3	710	106	114.0	1.08	1.27	1.27
V5	3	1170	227	93.0	0.40	1.00	0.80

9.5.2.5 Comments on Vibration Monitoring Results

It can be seen from the summary above that none of the measurements exceeded the PPV limit of 12 mm/s in any direction, nor the 125 dB(lin) AOP limit although one AOP measurement (at location V1) was at the limit.

9.6 PREDICTED OPERATIONAL NOISE AND VIBRATION IMPACTS

9.6.1 PREDICTED OPERATIONAL NOISE LEVELS

This section provides the results of noise modelling from each of the assessed operational scenarios and current operational condition described in 9.3.1.6.

9.6.1.1 Current Operational Condition

The predicted noise levels from the current operational condition for each NSR are provided in Table 9-21 with noise contours at a height of 4.0 m above ground level provided in Figure 9-9.

Table 9-21: Predicted noise levels for Current Operational Condition

Noise Sensitive Receptor	Predicted Noise Level, dB $L_{Aeq,1hr}$	Noise Limit, dB $L_{Aeq,T}$	Exceedance of Noise Limit, dB $L_{Aeq,T}$
R1	40.7	55.0	-14.3
R2	37.6	55.0	-17.4
R3	47.5	55.0	-7.5
R4	48.1	55.0	-6.9
R5	45.9	55.0	-9.1
R6	44.9	55.0	-10.1
R7	43.9	55.0	-11.1
R8	43.9	55.0	-11.1
R9	35.3	55.0	-19.7
R10	35.6	55.0	-19.4
R11	35.9	55.0	-19.1
R12	36.7	55.0	-18.3
R13	39.3	55.0	-15.7
R14	43.8	55.0	-11.2
R15	44.6	55.0	-10.4
R16	46.2	55.0	-8.8
R17	44.6	55.0	-10.4
R18	43.1	55.0	-11.9
R19	43.2	55.0	-11.8
R20	43.3	55.0	-11.7
R21	41.0	55.0	-14.0
R22	40.8	55.0	-14.2
R23	41.5	55.0	-13.5

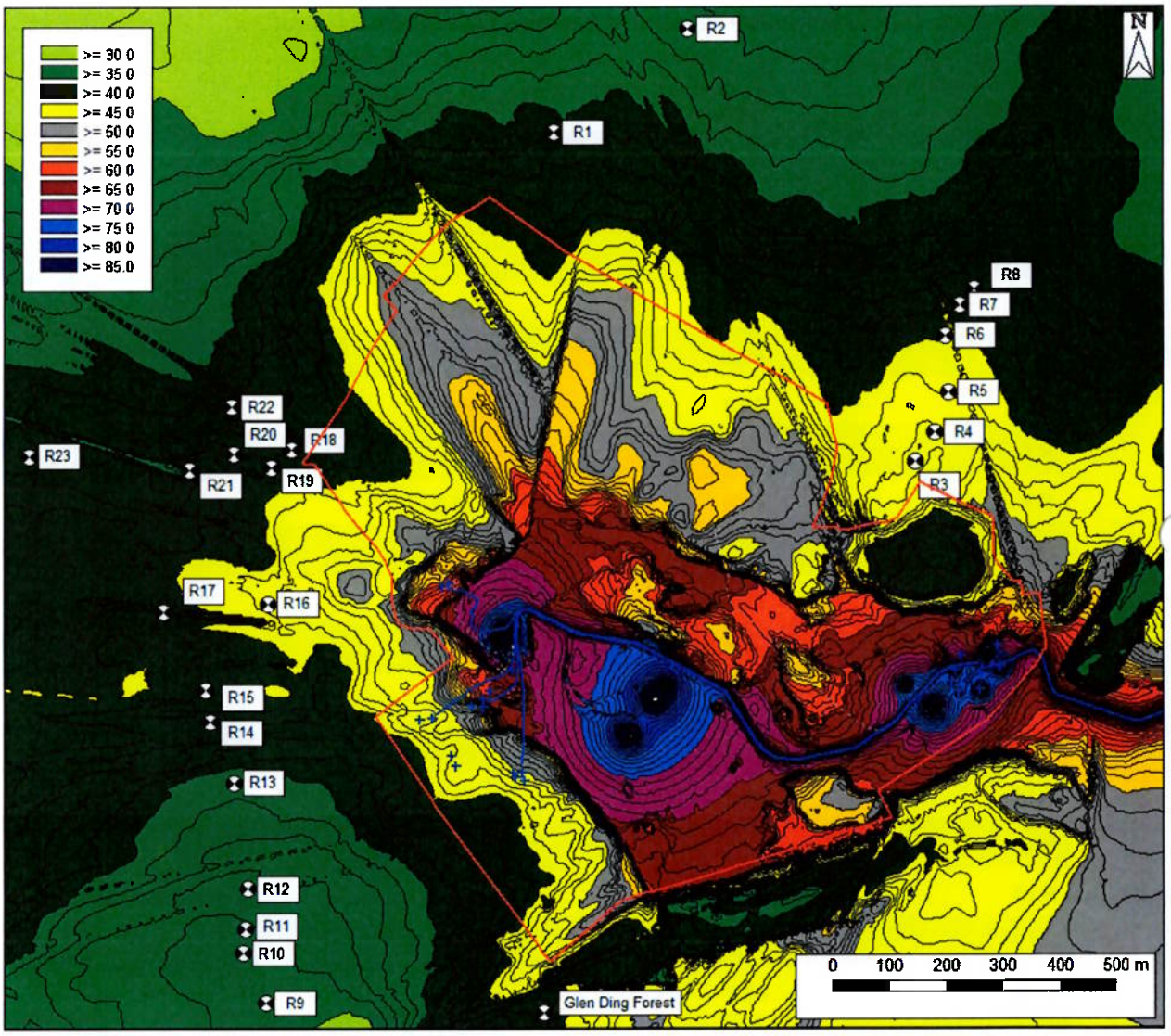

Figure 9-9: Current Operational Condition

9.6.1.2 Proposed Operational Scenario 1

The predicted noise levels from Scenario 1 for each NSR are provided in Table 9-22 with noise contours at a height of 4.0 m above ground level provided in Figure 9-10.

Table 9-22: Predicted noise levels for Operational Scenario 1

Noise Sensitive Receptor	Predicted Noise Level, dB $L_{Aeq,1hr}$	Noise Limit, dB $L_{Aeq,T}$	Exceedance of Noise Limit, dB $L_{Aeq,T}$
R1	40.3	55.0	-14.7
R2	38.0	55.0	-17.0
R3	49.2	55.0	-5.8
R4	50.3	55.0	-4.7
R5	46.9	55.0	-8.1
R6	47.3	55.0	-7.7
R7	46.3	55.0	-8.7
R8	45.9	55.0	-9.1
R9	38.2	55.0	-16.8
R10	39.4	55.0	-15.6
R11	40.0	55.0	-15.0
R12	41.0	55.0	-14.0
R13	44.1	55.0	-10.9
R14	46.8	55.0	-8.2
R15	46.5	55.0	-8.5
R16	46.4	55.0	-8.6
R17	44.9	55.0	-10.1
R18	42.7	55.0	-12.3
R19	43.1	55.0	-11.9
R20	43.2	55.0	-11.8
R21	41.0	55.0	-14.0
R22	40.1	55.0	-14.9
R23	41.2	55.0	-13.8

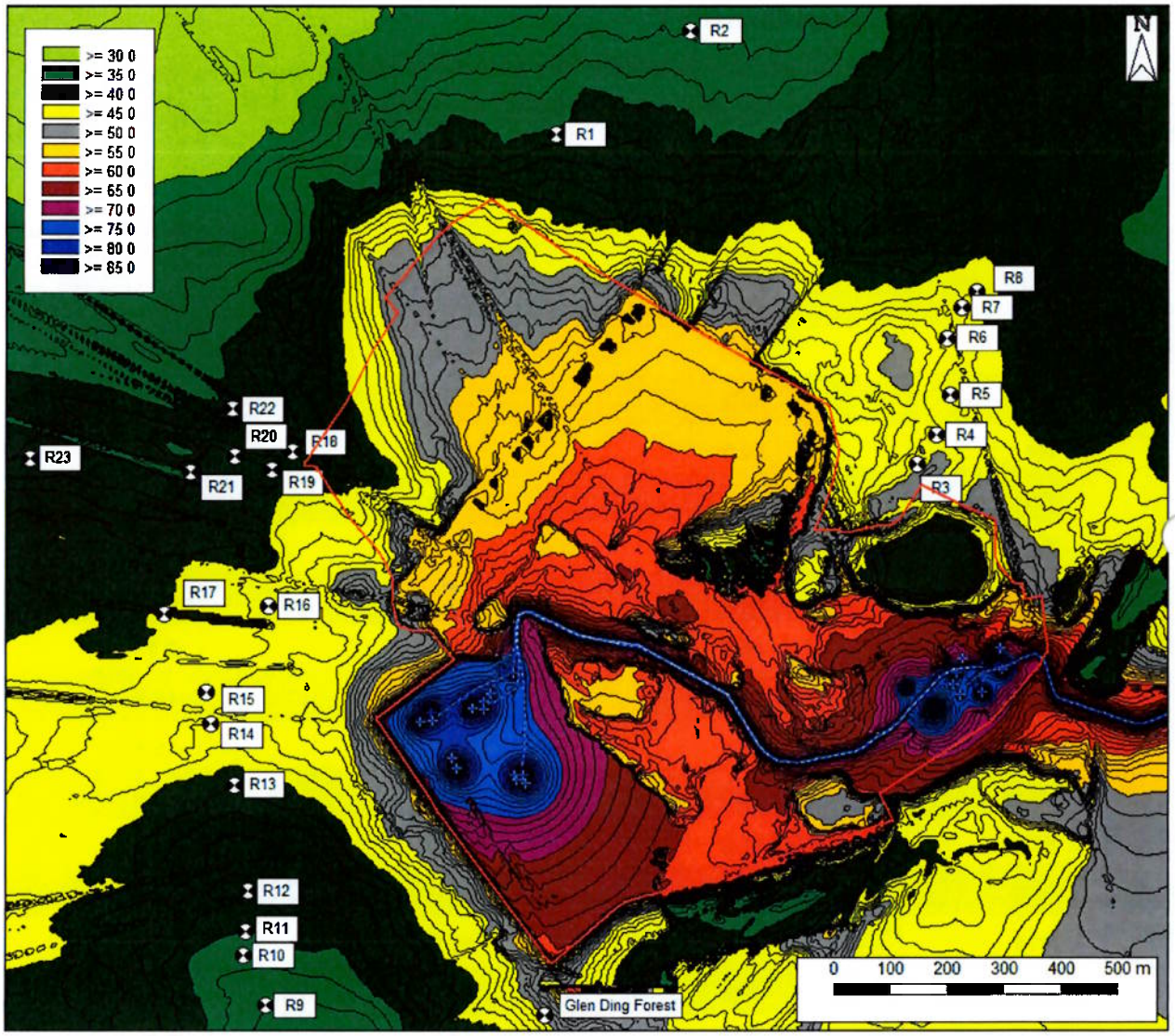

Figure 9-10: Scenario 1 – Noise contours at 4.0 m height, dB $L_{Aeq,1hr}$

9.6.1.3 Proposed Operational Scenario 2

The predicted noise levels from Scenario 2 for each NSR are provided in Table 9-23 with noise contours at a height of 4.0m above ground level provided in Figure 9-11.

Table 9-23: Predicted noise levels for Operational Scenario 2

Noise Sensitive Receptor	Predicted Noise Level, dB $L_{Aeq,1hr}$	Noise Limit, dB $L_{Aeq,T}$	Exceedance of Noise Limit, dB $L_{Aeq,T}$
R1	40.9	55.0	-14.1
R2	38.5	55.0	-16.5
R3	49.1	55.0	-5.9
R4	50.2	55.0	-4.8
R5	47.0	55.0	-8.0
R6	47.2	55.0	-7.8
R7	46.1	55.0	-8.9
R8	45.8	55.0	-9.2
R9	38.6	55.0	-16.4
R10	39.8	55.0	-15.2
R11	40.4	55.0	-14.6
R12	41.3	55.0	-13.7
R13	44.5	55.0	-10.5
R14	47.2	55.0	-7.8
R15	47.1	55.0	-7.9
R16	48.1	55.0	-6.9
R17	45.8	55.0	-9.2
R18	44.0	55.0	-11.0
R19	44.1	55.0	-10.9
R20	44.0	55.0	-11.0
R21	41.8	55.0	-13.2
R22	41.3	55.0	-13.7
R23	41.7	55.0	-13.3

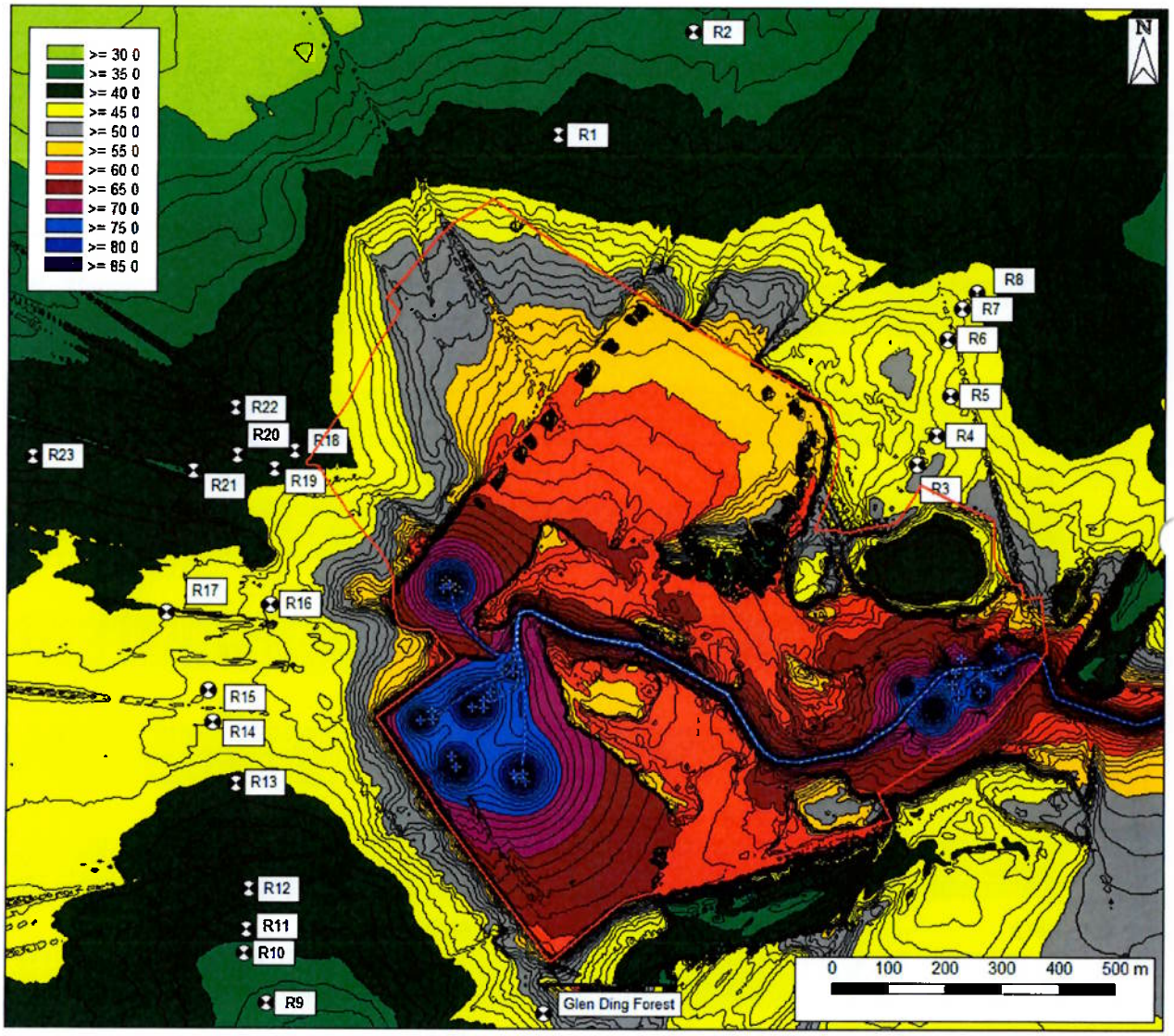

Figure 9-11: Scenario 2 – Noise contours at 4.0m height, dB $L_{Aeq,1hr}$

9.6.1.4 Proposed Operational Scenario 3

The predicted noise levels from Scenario 3 for each NSR are provided in Table 9-24 with noise contours at a height of 4.0m above ground level provided in Figure 9-12..

Table 9-24: Predicted noise levels for Operational Scenario 3

Noise Sensitive Receptor	Predicted Noise Level, dB $L_{Aeq,1hr}$	Noise Limit, dB $L_{Aeq,T}$	Exceedance of Noise Limit, dB $L_{Aeq,T}$
R1	41.5	55.0	-13.5
R2	38.6	55.0	-16.4
R3	49.2	55.0	-5.8
R4	50.3	55.0	-4.7
R5	47.1	55.0	-7.9
R6	47.3	55.0	-7.7
R7	46.2	55.0	-8.8
R8	45.8	55.0	-9.2
R9	38.9	55.0	-16.1
R10	40.0	55.0	-15.0
R11	40.7	55.0	-14.3
R12	41.8	55.0	-13.2
R13	44.8	55.0	-10.2
R14	47.4	55.0	-7.6
R15	47.4	55.0	-7.6
R16	48.1	55.0	-6.9
R17	46.0	55.0	-9.0
R18	44.5	55.0	-10.5
R19	44.5	55.0	-10.5
R20	44.4	55.0	-10.6
R21	42.3	55.0	-12.7
R22	41.6	55.0	-13.4
R23	42.2	55.0	-12.8

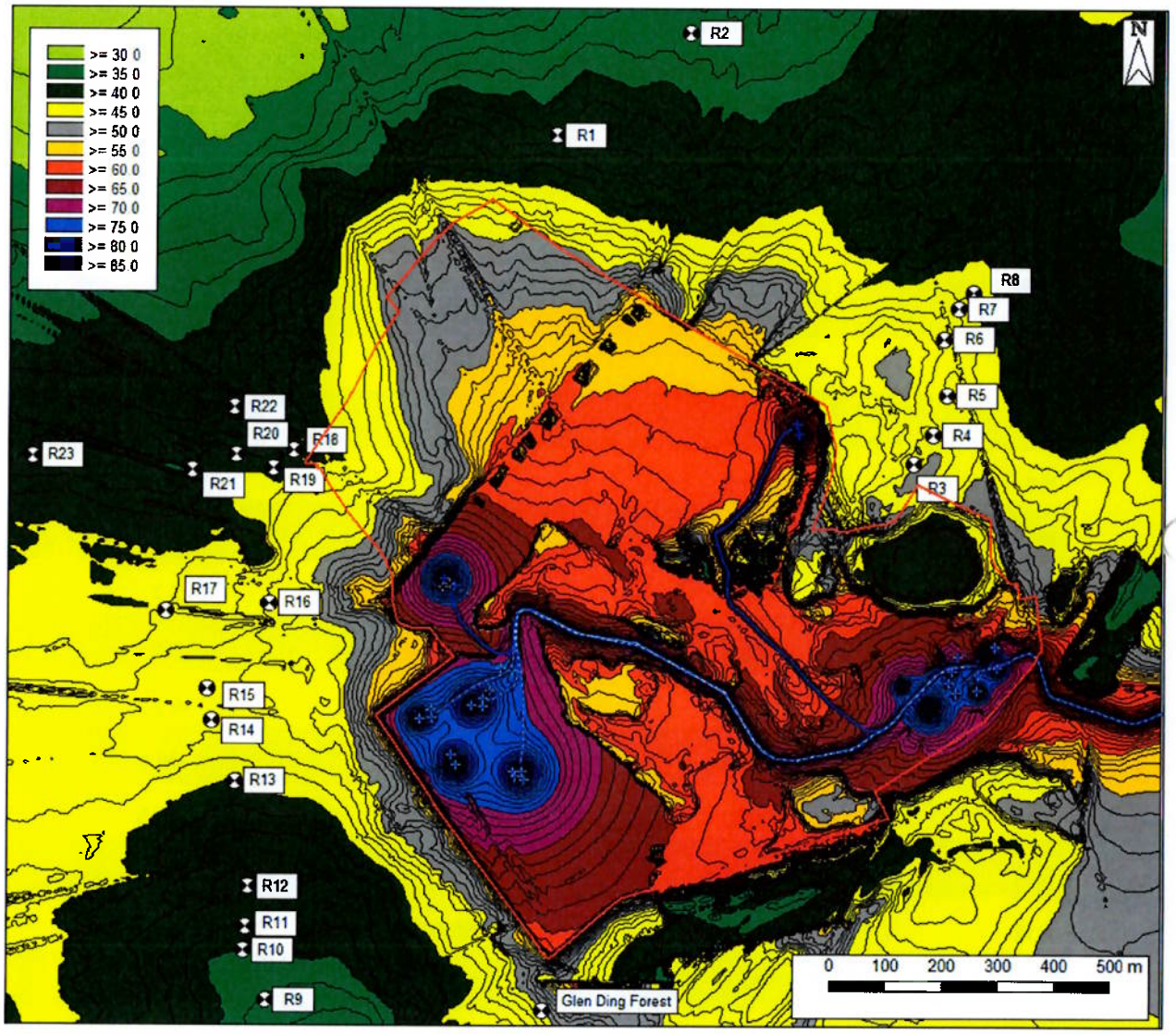

Figure 9-12: Scenario 3 – Noise contours at 4.0m height, dB $L_{Aeq,1hr}$

9.6.1.5 Comments on Predicted Operational Noise Levels

It can be seen from the summary tables above that the daytime operational noise limit of 55 dB $L_{Aeq,T}$ is predicted to be achieved at all receptors during each of the three proposed operational scenario and the current operational condition. It is acknowledged that the predicted levels for the future proposed scenarios include the attenuating effect of the proposed 6 m high earthworks bund along the northern site boundary of the northern extension area. This will be included within the embedded mitigation proposed for the Proposed Development.

9.6.1.6 Predicted Operational Noise at Glen Ding Wood

The wood is considered a lower value NSR compared to the residential NSRs identified in

Figure 9-1 and Table 9-1 and assessed in 9.3.1. This is due to the amenity classification of the woodland and the transient nature of users as receptors of the noise.

Nevertheless, the wood was included in the three predicted scenarios and the current operational condition as used for the residential NSRs. The resultant predicted noise levels are provided in Table 9-25.

Table 9-25: Predicted operational noise levels at Glen Ding Wood

Operational Scenario	Noise Level, dB $L_{Aeq,1hr}$
Current Operational Condition	41.4
Scenario 1	48.8
Scenario 2	48.5
Scenario 3	48.5

It is evident that predicted noise levels for current and proposed future operational scenarios are below the 55 dB $L_{Aeq,T}$ limiting value for the Application Site and below the level which would normally be considered acceptable within an outdoor amenity area (in accordance with guidance within BS 8233). It is therefore considered that noise from activities within the Application Site will have a 'not significant' impact on the amenity of the Glen Ding woodland.

9.6.1.7 Comparison of Predicted Noise Levels with Noise Levels Measured at Receptors

A comparison has been made of the predicted operational noise levels against the noise levels measured at representative locations during the noise surveys conducted between 2019 and 2023. The existing daytime value is derived as the logarithmic average of all sample periods measured during the daytime at each location. Table 9-26 below shows the comparison for the three quarrying scenarios. Cells in orange signify an exceedance of the daytime baseline noise level (rather than the permitted limit, which is not exceeded for any operational scenario). The predicted levels at each of the five noise monitoring locations are also provided for reference.

Table 9-26: Comparison of predicted operational noise levels for Current Operational Condition plus future Scenarios 1 to 3 against existing baseline noise levels measured at nearest monitoring positions

Receptor	Nearest Monitoring Position	Existing Noise Level, dB $L_{Aeq,T}$*	Predicted Operational Noise Level, dB$L_{Aeq,1hr}$				Predicted Operational Noise Level minus Existing Noise Level, dB			
			Curr.	Sc.1	Sc.2	Sc.3	Curr.	Sc.1	Sc.2	Sc.3
R1	N3K	46.3	40.7	40.3	40.9	41.5	-5.6	-6.0	-5.4	-4.8
R2	N3K	46.3	37.6	38.0	38.5	38.6	-8.7	-8.3	-7.8	-7.7
R3	N4K	47.1	47.5	49.2	49.1	49.2	0.4	2.1	2.0	2.1
R4	N4K	47.1	48.1	50.3	50.2	50.3	1.0	3.2	3.1	3.2
R5	N4K	47.1	45.9	46.9	47.0	47.1	-1.2	-0.2	-0.1	0.0
R6	N4K	47.1	44.9	47.3	47.2	47.3	-2.2	0.2	0.1	0.2

Receptor	Nearest Monitoring Position	Existing Noise Level, dB $L_{Aeq,T}$*	Predicted Operational Noise Level, dB$L_{Aeq,1hr}$				Predicted Operational Noise Level minus Existing Noise Level, dB			
			Curr.	Sc.1	Sc.2	Sc.3	Curr.	Sc.1	Sc.2	Sc.3
R7	N4K	47.1	43.9	46.3	46.1	46.2	-3.2	-0.8	-1.0	-0.9
R8	N4K	47.1	43.9	45.9	45.8	45.8	-3.2	-1.2	-1.3	-1.3
R9	N1K	61.3	35.3	38.2	38.6	38.9	-26.0	-23.1	-22.7	-22.4
R10	N1K	61.3	35.6	39.4	39.8	40.0	-25.7	-21.9	-21.5	-21.3
R11	N1K	61.3	35.9	40.0	40.4	40.7	-25.4	-21.3	-20.9	-20.6
R12	N1K	61.3	36.7	41.0	41.3	41.8	-24.6	-20.3	-20.0	-19.5
R13	N1K	61.3	39.3	44.1	44.5	44.8	-22.0	-17.2	-16.8	-16.5
R14	N1K	61.3	43.8	46.8	47.2	47.4	-17.5	-14.5	-14.1	-13.9
R15	N1K	61.3	44.6	46.5	47.1	47.4	-16.7	-14.8	-14.2	-13.9
R16	N1K	61.3	46.2	46.4	48.1	48.1	-15.1	-14.9	-13.2	-13.2
R17	N1K	61.3	44.6	44.9	45.8	46.0	-16.7	-16.4	-15.5	-15.3
R18	N2K	50.1	43.1	42.7	44.0	44.5	-7.0	-7.4	-6.1	-5.6
R19	N2K	50.1	43.2	43.1	44.1	44.5	-6.9	-7.0	-6.0	-5.6
R20	N2K	50.1	43.3	43.2	44.0	44.4	-6.8	-6.9	-6.1	-5.7
R21	N1K	61.3	41.0	41.0	41.8	42.3	-20.3	-20.3	-19.5	-19.0
R22	N2K	50.1	40.8	40.1	41.3	41.6	-9.3	-10.0	-8.8	-8.5
R23	N1K	61.3	41.5	41.2	41.7	42.2	-19.8	-20.1	-19.6	-19.1
Glen Ding Wood	N5K	51.8	41.4	48.8	48.5	48.5	-10.4	-3.0	-3.3	-3.3
N1K	N1K	61.3	37.4	41.6	41.8	42.1	-23.9	-19.7	-19.5	-19.2
N2K	N2K	50.1	42.9	42.1	43.6	44.1	-7.2	-8.0	-6.5	-6.0
N3K	N3K	46.3	43.1	44.3	45.4	45.9	-3.2	-2.0	-0.9	-0.4
N4K	N4K	47.1	47.6	49.2	48.8	48.9	0.5	2.1	1.7	1.8
N5K	N5K	51.8	44.1	43.9	43.9	43.9	-7.7	-7.9	-7.9	-7.9

*Derived as the logarithmic average of all sample periods measured during the daytime at each location. Note that green shading denotes an increase in noise level above existing but <3.0 dB; orange denotes an increase in noise level above existing >3.0 dB.

It can be seen that, with the exception of locations R3, R4 and R6, the predicted noise level due to quarrying activities under each scenario is below the measured baseline noise level at each receptor. At R3 and R6, the predicted noise levels for Scenarios 1, 2 and 3 are above the measured $L_{Aeq,T}$ by up to 2.1 dB. At R4, the predicted noise levels for Scenarios 1, 2 and 3 are above the measured $L_{Aeq,T}$ by up to 3.2 dB.

The predicted levels at the noise monitoring positions are below existing measured levels with the exception of N4K, where there is a maximum 2.1 dB uplift (compared with the measured level) for all three scenarios.

To give context to these increases, a 3 dB difference in noise level is usually considered to be the minimum change normally perceptible by the human ear under 'real world' situations (as opposed to a controlled laboratory environment).

It is noted that the predicted current operational scenario is also below the measured level in almost every case, the exceptions being R3 and R4, where the predicted level is 0.4 dB and 1.0 dB respectively above measured. When considering the predicted levels at each measurement location, all are below measured with the exception of N4K (the closest measurement location to R3 and R4) where it is just 0.5 dB above measured. This exercise does indicate that noise sources other than the quarry influence the acoustic climate at most receptors, although the good correlation between predicted and measured at N4K (and nearby NSRs) suggest other noise source are less of an influence.

It should be noted that predicted noise levels are within the acceptable limits of the existing planning permission and those prescribed in Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (EPA 2006).

9.6.2 PREDICTED VIBRATION RESULTS

9.6.2.1 Ground Borne Vibration

Results from vibration monitoring during blasting at the quarry have been analysed using scaled distance graphs and regression analysis techniques following the guidance presented within BS 6472-2:2008. The use of a scaled distance graph allows the prediction of the likely vibration level at a given distance for a given MIC. The scaled distance approach follows the following equation:

$$s=d\sqrt{C}\ ;$$

where s is the scaled distance, d is the slant distance and C is the MIC.

The scaled distance graph using the provided vibration monitoring data is presented in Figure 9-13 below.

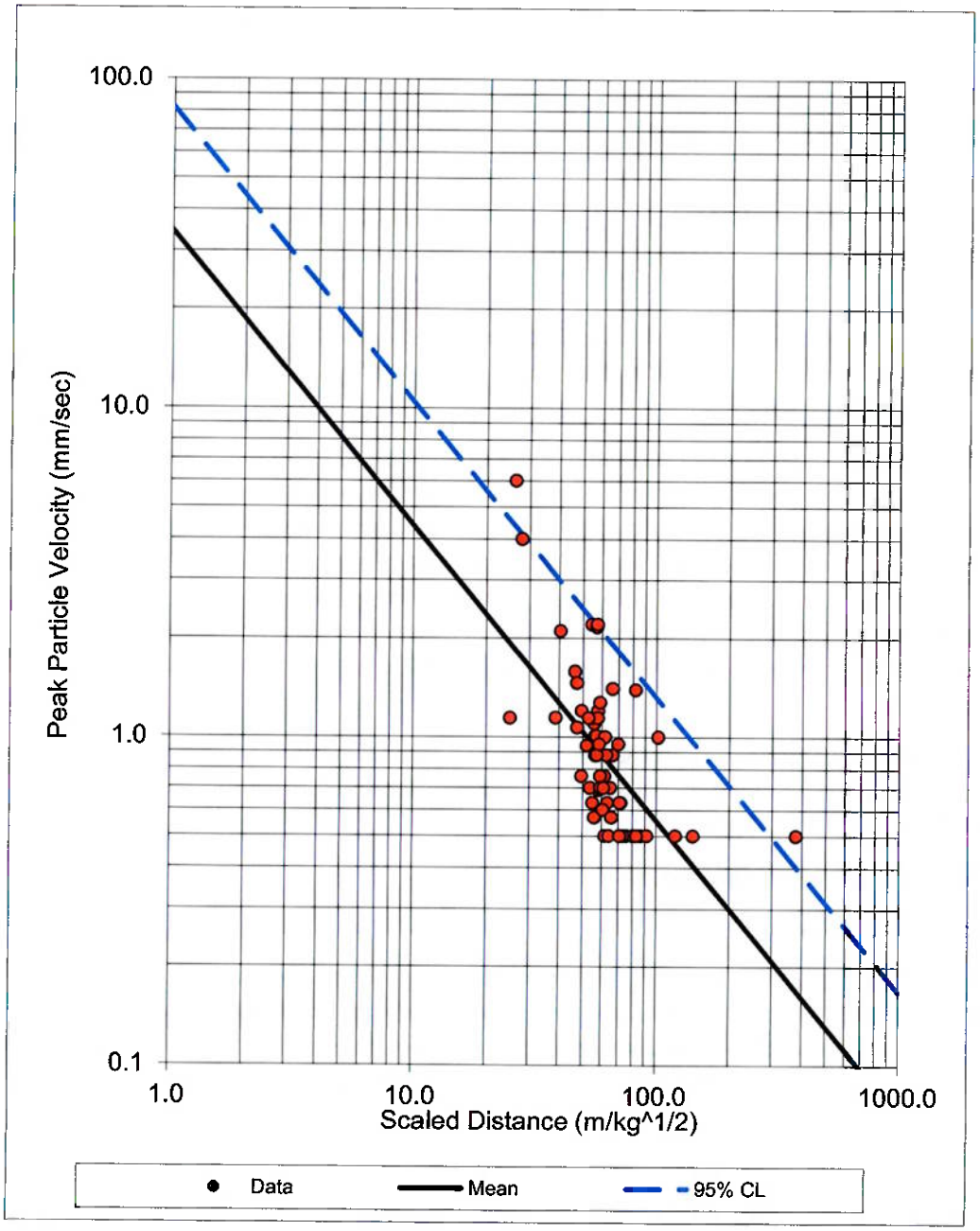

Figure 9-13: Scaled distance against maximum peak particle velocity

The distance of the nearest vibration sensitive receptor to the proposed blasting locations is approximately 300 m and the maximum MIC used to date in blasting at the site is 285 kg. Under these conditions, the predicted maximum PPV at the nearest receptor, calculated with a 95% confidence level (CL), would be 6.2 mm/s and the permitted limit of 12 mm/s is unlikely to be exceeded with even a substantial increase in MIC.

9.6.2.2 Air Overpressure

As advised in BS 6472-2, the accurate prediction of air overpressure is almost impossible due to the variable effects of the prevailing weather conditions in the vicinity of the blast site. Meteorological

conditions such as air temperature, lapse rate (the rate at which temperature changes with height), cloud cover, humidity, wind speed and direction can all affect the magnitude of air overpressure at any particular location. This makes any quantitative prediction of air overpressure highly unreliable.

The control of air overpressure should always be via its minimisation at source through appropriate blast design, as directed by the blasting contractor. Ongoing monitoring of vibration and air overpressure at nearby vibration sensitive receptors will be undertaken during each blast to assist this process.

9.6.3 VIBRATION AND AIR OVERPRESSURE CONTROL MEASURES

9.6.3.1 Groundborne Vibration Control

Groundborne vibration from blasting at any receptor is influenced mainly by:

- The characteristics of the rock mass;
- The MIC of explosives;
- The medium between blast source and receptor point; and
- The distance between the blast source and receptor point.

Groundborne vibration control is based on reducing the weight of explosives detonated per delay (reducing the maximum instantaneous charge). In any given situation, large amounts of explosives can be detonated using time delay intervals between each specific charge within the overall blast. The peak level of ground vibration is related to the maximum charge weight per delay.

In terms of predicting ground vibration, each location is 'site specific'. However, ground vibration is recorded simultaneously for each blast at a minimum of one sensitive location.

9.6.3.2 Air Overpressure Control

The principal factors governing AOP are as follows:

a) The type and quantity of explosives;
b) The degree of confinement (plaster shooting, overcharging and poor stemming);
c) The method of initiation (exposed detonating fuse etc.);
d) Local geology and topography;
e) Atmospheric conditions; and
f) Distance and condition of structures.

Factors a), b) and c) are variables within the control of the quarry operator whereas d), e) and f) are essentially uncontrollable at any particular site. However, by varying the timing of a blast (avoid early morning or late evening), the quantities of explosives, the degree of confinement and the method of initiation, the quarry operator, in effect, achieves partial control over the influence of atmospheric conditions and hence over the blast emissions.

9.6.4 MAGNITUDE OF NOISE AND VIBRATION IMPACTS

The following table provides a summary of the potential noise effects and magnitude of noise impact resulting from the three assessed operational scenarios:

Table 9-27: Summary of Potential Effects and Magnitude of Noise and Vibration Impacts

Operational Scenario	Sensitive Receptor(s)	Summary of Potential Effects	Likely Magnitude of Impacts and Level of Significance			
			Absolute Noise Level	Change in Noise Level	Vibration	Overall Noise and Vibration Impact
Sc. 1	R1, R2, R5, R9 to R23 inclusive, Glen Ding Wood	Noise limit not exceeded. No change in current noise level predicted. Existing acoustic climate likely to be unchanged. PPV likely to be <6 mm/s.	Negligible, imperceptible, not significant.	Negligible, imperceptible, not significant.	Negligible to low adverse, depending on proximity to blast site, imperceptible to slight, not significant.	Negligible, imperceptible. ***Not significant.***
	R3, R6	Noise limit not exceeded. <3.0 dB change in current noise level predicted. Possible that a perceptible change to existing acoustic climate occurs. PPV likely to be <6 mm/s.	Negligible, imperceptible, not significant.	Low adverse, imperceptible, not significant.	Negligible to low adverse, depending on proximity to blast site, imperceptible to slight, not significant.	Negligible to low adverse, imperceptible to slight. ***Not significant.***
	R4	Noise limit not exceeded. >3.0 dB change in current noise level predicted. May result in a perceptible change to existing acoustic climate. PPV likely to be <6 mm/s.	Negligible, imperceptible, not significant.	Low to medium adverse, slight to moderate, not significant.	Negligible to low adverse, depending on proximity to blast site, imperceptible to slight, not significant.	Low adverse, imperceptible to slight. ***Not significant.***
	Gas pipeline	Unlikely to be any change in vibration level as a result of blasting with PPV levels up to 6 mm/s.	-	-	Low adverse, slight, not significant.	Low adverse, slight. ***Not significant.***

Operational Scenario	Sensitive Receptor(s)	Summary of Potential Effects	Likely Magnitude of Impacts and Level of Significance			
			Absolute Noise Level	Change in Noise Level	Vibration	Overall Noise and Vibration Impact
Sc. 2	R1, R2, R5, R6, R9 to R23 inclusive, Glen Ding Wood	Noise limit not exceeded. No change in current noise level predicted. Existing acoustic climate likely to be unchanged. PPV likely to be <6 mm/s.	Negligible, imperceptible, not significant.	Negligible, imperceptible, not significant.	Negligible to low adverse, depending on proximity to blast site, imperceptible to slight, not significant.	Negligible, imperceptible ***Not significant.***
	R3	Noise limit not exceeded. <3.0 dB change in current noise level predicted. Possible that a perceptible change to existing acoustic climate occurs. PPV likely to be <6 mm/s.	Negligible, imperceptible, not significant.	Low adverse, slight, not significant.	Negligible to low adverse, depending on proximity to blast site, imperceptible to slight, not significant.	Negligible to low adverse, imperceptible to slight. ***Not significant.***
	R4	Noise limit not exceeded. >3.0 dB change in current noise level predicted. May result in a perceptible change to existing acoustic climate. PPV likely to be <6 mm/s.	Negligible, imperceptible, not significant.	Low to medium adverse, not significant.	Negligible to low adverse, depending on proximity to blast site, imperceptible to slight, not significant.	Low adverse, imperceptible to slight. ***Not significant.***
	Gas pipeline	Unlikely to be any change in vibration level as a result of blasting with PPV levels up to 6 mm/s.	-	-	Low adverse, slight, not significant.	Low adverse, slight. ***Not significant.***

Operational Scenario	Sensitive Receptor(s)	Summary of Potential Effects	Likely Magnitude of Impacts and Level of Significance			
			Absolute Noise Level	Change in Noise Level	Vibration	Overall Noise and Vibration Impact
Sc. 3	R1, R2, R5, R9 to R23 inclusive, Glen Ding Wood	Noise limit not exceeded. No change in current noise level predicted. Existing acoustic climate likely to be unchanged. PPV likely to be <6 mm/s.	Negligible, imperceptible, not significant.	Negligible, imperceptible, not significant.	Negligible to low adverse, depending on proximity to blast site, not significant.	Negligible, imperceptible. ***Not significant.***
	R3, R6	Noise limit not exceeded. <3.0 dB change in current noise level predicted. Possible that a perceptible change to existing acoustic climate occurs. PPV likely to be <6 mm/s.	Negligible, imperceptible, not significant.	Low adverse, slight, not significant.	Negligible to low adverse, depending on proximity to blast site, not significant.	Negligible to low adverse, imperceptible to slight. ***Not significant.***
	R4	Noise limit not exceeded. >3.0 dB change in current noise level predicted. May result in a perceptible change to existing acoustic climate. PPV likely to be <6 mm/s.	Negligible, imperceptible, not significant.	Low to medium adverse, not significant.	Negligible to low adverse, depending on proximity to blast site, not significant.	Low adverse, slight. ***Not significant.***
	Gas pipeline	Unlikely to be any change in vibration level as a result of blasting with PPV levels up to 6 mm/s.	-	-	Low adverse, slight, not significant.	Low adverse, slight. ***Not significant.***

At the majority of receptors, the likely magnitude of noise and vibration impact is predicted to be negligible or low adverse for each operational scenario, which is ***not significant***.

At receptor R4 the likely magnitude of noise impact is predicted to be low to medium adverse for each operational scenario as a result of the predicted increase in noise level of up to 3.1 dB compared with the baseline condition. However, as the predicted operational noise level is below the threshold level, the overall impact is considered to be low adverse, which is ***not significant***.

The magnitude of vibration impact at each of the blast monitoring locations was either negligible or low adverse, depending on the proximity to the blast, and is predicted to remain so under future proposed blasting conditions. The predicted vibration impact at each assessment location is, therefore, ***not significant***.

Nevertheless, mitigation to control noise and vibration impacts will be required and is discussed in the following section.

9.7 MITIGATION

9.7.1 NOISE CONTROL

Noise control measures for the proposed operations will be incorporated into the design and operation from the existing quarry operation's management and work practices. A noise monitoring programme at the five existing noise monitoring locations will be maintained at bi-annual intervals - this will determine compliance with the permitted noise limits and the effectiveness of mitigation. Measures to manage potential noise impacts include:

- Any measured exceedances of the threshold levels at locations representative of the nearest noise sensitive receptors as a result of quarrying operations will be communicated to the Quarry Manager on the day of the monitoring surveys so that the cause of the exceedance can be identified and measures put in place to reduce noise below the threshold level.
- Site activities will only take place during the permitted hours of operation and will be monitored to determine compliance with the conditioned noise limits. There will be no activities on site on Sundays or public holidays.
- Perimeter screening berms will be constructed as appropriate along the boundaries of the proposed extended operational area to reduce noise propagation beyond the quarry boundary. This includes a 6 m high berm along the boundary of the proposed northern extension to the Site.
- All haul roads will be kept clear and maintained in a good state of repair to minimise noise from rattling and bouncing of mobile plant.
- Heavy goods vehicles entering and leaving the quarry will have tailgates securely fastened. All mobile plant used at the proposed development will have noise emission levels that comply with relevant guidance.
- Plant will be operated in a proper manner with respect to minimising noise emissions, e.g. minimisation of drop heights, no unnecessary revving of engines, plant used intermittently not left idling.
- Plant will be subject to regular maintenance, i.e., all moving parts kept well lubricated, the integrity of silencers and acoustic hoods maintained.
- Haul routes within the northern pits should be demarked around the perimeter of the pit to maximise topographical screening to reduce any potential noise impacts on nearby residential dwellings.

- Haul routes will be designed so as to have as low a gradient as possible so as to minimise excessive revving of vehicle engines on-site.
- 30 kmph speed limit will be applied to access road.
- Plant will be fitted with effective exhaust silencers and maintained in good working order to meet manufacturers' noise rating levels. Defective silencers will be replaced.
- Quarry operations such as blasting, excavation or crushing will not occur outside normal operating hours.
- All site plant, machinery and vehicles will shut down when not in use.

9.7.2 VIBRATION CONTROL

The following blast mitigation procedures will continue to be employed during each blast event at the quarry:

- Blast events will be conducted by an approved blasting contractor in accordance with best practice in this field, and potential impacts associated with the activity will therefore be minimised.
- All operatives involved in the blasting procedure will be adequately trained and suitably competent.
- The use of delayed blasting techniques whereby each blast event takes place in a series of timed small blasts rather than a single large blast will be employed to minimise vibrations in the rock body.
- All shot holes will be drilled to exact specifications by specialist contractors. Any features encountered during drilling such as cavities or soft material will be recorded by the drilling contractor and this information will be subsequently passed on to the shot-firer so that the correct charge will be used. This will ensure safe and efficient blasting of the rock face.
- In addition to implementing the necessary blast specifications, the quarry operator will provide appropriate advance warning of blasts to neighbouring residents, undertake required environmental monitoring and record any complaints arising, as detailed below.
- The following blast warnings will be provided by the quarry:
  - A warning sign will be posted at the quarry entrance on the day of each blast and will be removed following each blast;
  - Residents will be notified of blasting times by means of a phone call or text message prior to the blast taking place;
  - The blast operator signals 30 seconds prior to each blast;
  - The blast operator signals after each blast.
- Drilling contractors complete a log for every borehole drilled, and the drilled holes are probed for an as-built survey of each to confirm the holes' specifications.
- Ensuring that the optimum blast ratio is maintained and ensuring that the maximum amount of explosive on any one delay, the maximum instantaneous charge is optimised so that the ground vibration levels are kept below those specified.
- Blasting shall be confined to between 10:00 to 18:00 Monday to Friday. Blasting shall not take place on Saturdays (or Sundays and public holidays).
- Vibration levels from blasting shall not exceed a peak particle velocity of 12 millimetres per second, measured in any three mutually orthogonal directions at any sensitive location. The peak particle velocity relates to low frequency vibration of less than 40 hertz where blasting occurs no more than once in seven continuous days. Where blasting operations are more

frequent, the peak particle velocity limit is reduced to eight millimetres per second. Blasting shall not give rise to air overpressure values at sensitive locations which are in excess of 125 dB (Linear) maximum peak with a 95% confidence limit. No individual air overpressure value shall exceed the limit value by more than 5 dB (Linear).

- The quarry operator will engage with GNI to agree appropriate vibration limits for its infrastructure and a method and programme of monitoring such that compliance with limits will be established as required.
- All blasts measured (ground vibration and air overpressure) in the area of at least one sensitive residence to determine compliance with the aforementioned limits and, so that information can be employed in any necessary modification of future blast designs.

9.7.3 PROPOSED ADDITIONAL MITIGATION MEASURES FOR FUTURE OPERATION

The following additional measures are proposed:

- Vibration monitoring records will continue to be maintained by the Quarry Manager (or appointed Environmental Manager) and will be available for display to local residents that may have been affected by site operations; and
- The Quarry Manager (or appointed Environmental Manager) will maintain a written complaints log in which all complaints made by local residents are detailed. This will ensure that the concerns of local residents who may be affected by site activities are considered during the management of activities at the quarry site.
- Monitoring of vibration levels at local residences will be conducted in agreement and with the consent of local residents. The Quarry Manager (or appointed Environmental Manager) will give at least 24-hours' notice to the residents at whose homes vibration monitoring will occur. GNI will also be contacted in advance of any blasting activities in close proximity to their pipeline to the north of the quarry.

9.8 CUMULATIVE EFFECTS

9.8.1 NOISE

Quarrying activities currently take place in the adjacent sites to the south and east of the Application Site. Cumulative impacts of the activities within the Application Site and these surrounding developments on the local noise environment are considered *'imperceptible'*. Quarrying activities were operational at both local sites during the noise surveys and cumulative noise was assessed. As demonstrated in these surveys the ambient noise in the locality was dominated by the regional road network. Noise from typical site work practices, the quarry facility to the south of the Site, the quarry facility to the east and the regional road network are not considered to cumulatively impact the local sound environment.

There is no discernible effect in cumulative noise anticipated as a result of proposed activities at the Application Site.

9.8.2 VIBRATION

Other quarrying activities taking place to the east and south of the site consist of sand and gravel extraction by mechanical means. Therefore, cumulative vibration impacts of the Application Site and adjacent quarry operations are considered *'negligible'* as there is no requirement to conduct blasting for rock extraction at these other operations.

The closest quarries to the Application Site which conduct blasting activities for rock are located ca. 2.2 km to the north-west. Given the distance of these operations from each other and the strict blasting controls employed at these sites, any cumulative impacts are deemed to be *'imperceptible'*.

Phased restoration activities at the existing quarry and the Application Site do not use blasting techniques. Restoration will be carried out using mobile plant. Therefore, there will be no cumulative impacts from extractive phases at the Application Site and restoration activities at the existing quarry and proposed development.

9.9 RESIDUAL EFFECTS

9.9.1 NOISE

At present the noise environment at the Application Site is typical of a rural setting with influences of the national road to the southeast of the Site and slight influences of the extractive industry and road traffic noted. Any impacts resulting from the continuation of the quarry void in this Application are considered consistent with the existing permitted development and, with the implementation of the noise mitigation techniques detailed in Section 9.7, would be ***not significant.***

It is considered that there will be no significant residual effect from noise at the Application Site on the local environs if the mitigation measures practiced on site and outlined in Section 9.7 are adhered to.

9.9.2 VIBRATION

Once all mitigation measures, as highlighted in Section 9.7 are adopted there should be no significant residual vibration effects in the area after blasting is completed. However, there may be some concerns from local residences about damage to their properties. Recent research shows that blasting can have the potential to upset people but well-established quarries which have developed good relationships with local residents are less likely to attract complaints.

In general, complaints concerning blast-induced vibration are not the result of actual structural damage, but rather due to adverse human responses and fears of structural damage[1].

9.10 DIFFICULTIES AND CHALLENGES ENCOUNTERED

Some of the survey work undertaken for this assessment coincided with the Covid-19 global pandemic, and as such it is possible that road traffic and commercial activities at the height of the pandemic between March 2020 and around Spring 2021 were at lower levels than before Covid-19 restrictions came into force. As a result, measured baseline noise levels during this period where road traffic was a dominant source may have been lower than would have been expected in the pre-Covid situation.

The above comments notwithstanding, it is not immediately obvious that baseline measurements were adversely affected by Covid related changes in road traffic. For example, at N1K (the receptor closest to the R410), one of the lowest measured noise levels was recorded on 5th March 2020,

[1] Farnfield, R.A. (1998) Environmental Effects of Blasting - Recent Experiences. International Mining and Minerals. 1, 4, 94-99.

although this was taken several weeks prior to Ireland's first Covid related national 'stay-at-home' order and therefore before significant restrictions on travel came into play.

Nevertheless, any reduction in road traffic flows that may affect baseline noise levels would result in a greater prominence of quarrying noise, thereby resulting in a more representative assessment.

9.11 CONSIDERATION OF THIRD-PARTY SUBMISSIONS MADE DURING THE HBL 2020 PLANNING APPLICATION (KCC REG. REF.: 20/532)

Following the submission of the 2020 planning application (KCC Reg. Ref.: 20/532) a number of third-party submissions were received by KCC. These third-party submissions were considered as part of the Further Information response submitted to KCC prior to the invalidation of the application in September 2020. In the compilation of this section these submissions, concerns and points of note have been addressed in this assessment. Table 9-28 below provides a general summary of submissions relevant to this section and details where or how this item has been considered.

Table 9-28 - KCC Reg. Ref.: 20/532 Third-Party Submissions Items Relevant to the Noise and Vibration Assessment

Submission Item Summary	Comment
Residential amenity	Residential amenity of the surrounding receptors has been considered in the predictive assessment – See Section 9.6
Structural damage to nearby homes from blasting	The measured air overpressure levels were substantially lower than the levels which would see structural damage to windows. The predicted vibration impact due to blasting is predicted to be negligible to low adverse, depending on the proximity to the blast site, which is not significant.
Potential damage from blasting to the high-pressure gas pipeline that runs to the north of the subject site	Potential adverse effects to the GNI gas transmission pipeline have been assessed in this chapter. Please refer to Sections 9.6.2, 9.6.3, and 9.6.4. Potential impacts to the gas transmission pipeline are not significant.
Noise, dust and air pollution	The potential adverse impacts from noise as a result of the proposed development have been discussed and assessed throughout this chapter, with the overall impact categorised as 'not significant'.
Noise monitoring to be undertaken at the nearest occupied dwelling and at other noise sensitive locations in the vicinity of the quarry and the haul route	The noise monitoring locations adopted in the site's routine surveys have been located at the closest NSRs or at a location closer to the development to be representative of a number of NSRs in that area. See Section 9.5.1.2.
Corrective noise action to be incorporated into the Environmental Management Plan if exceedances of permitted limits are recorded	Environmental compliance is managed on site under the HBL Environmental Management System. Any exceedances reported to the Site are directed to the Quarry Manager for immediate investigation.

HSE submission - Include steps to be undertaken where noise, air water quality exceedances occur	Environmental compliance is managed on site under the HBL Environmental Management System. Any exceedances reported to the Site are directed to the Quarry Manager for immediate investigation.
HSE submission - Noise and vibration monitoring to be undertaken at nearest sensitive locations along the western boundary where blasting will occur,	The noise monitoring locations adopted in the site's routine surveys have been located at the closest NSRs or at a location closer to the development to be representative of a number of NSRs in that area. See Section 9.5.1.2. Vibration monitoring is to be undertaken the nearest sensitive receptors surrounding the site and at the gas transmission pipeline. The closest receptors are monitored during each blast.

9.12 SUMMARY AND CONCLUSIONS

This assessment has considered potential noise and vibration impacts associated with the proposed future operations of the quarry on the amenity of residents at existing nearby properties. It has also assessed noise impacts on Glen Ding Wood and vibration impacts on the GNI gas transmission pipeline.

The assessment has comprised a desk-top study to determine an appropriate study area and identify potentially sensitive receptors, prediction of worst-case operational phase noise and vibration levels, and evaluation against appropriate criteria. In addition to this desk-top assessment, baseline noise monitoring during existing quarrying operations has been undertaken at least biannually at five monitoring locations around the Site between April 2019 and January 2024 and this has been used to inform the noise impact assessment. Vibration and air overpressure monitoring has also been undertaken between February 2018 and August 2020 during periods of quarry blasting by the blasting contractor at five further vibration monitoring locations.

The baseline noise environment included contributions from road traffic noise, quarrying activities, other traffic sources, e.g. occasional overhead aircraft, and other sources typical of a rural environment, e.g., birdsong and rustling trees. With the exception of N1K, the average measured noise level at each location did not exceed the permitted level. At N1K, the exceedance was due to road traffic noise from the R410 rather than from quarrying activities.

Operational noise from the quarry has been predicted for three future operational scenarios within the proposed extensions to the quarry. These scenarios occur during daytime periods only; night-time operations are not proposed (and do not currently take place). All modelled scenarios have followed a conservative approach to determine the likely 'worst-case' noise levels at NSRs. Predicted noise levels for each operational scenario are within the permitted daytime limits and the levels recommended by the EPA Environmental Management Guidelines – Environmental Management in Extractive Industry.

The specific noise levels from quarry operations for each modelled scenario are predicted to not exceed the permitted threshold level, resulting in a negligible adverse impact at all NSRs which is ***not significant***.

At NSRs R3 and R6, noise levels are predicted to increase the ambient noise level above the measured noise level (relative to the nearest measurement location) by <3dB for Scenarios 1 and 3

and no increase for Scenario 2, which may result in a negligible or low adverse impact at these NSRs which is ***not significant***.

At NSR R4, the noise level is predicted to increase the ambient noise level above the measured noise level (relative to the nearest measurement location) by >3dB but <5dB for all future operational scenarios, which may result in a low to medium adverse impact at this NSR which is ***not significant***.

At all other NSRs and at Glen Ding Wood, there is predicted to be no or negligible change in ambient noise level (relative to the nearest measurement location) due to proposed future quarrying activities which is ***not significant***.

Vibration monitoring undertaken between 2018 and 2020 at the nearest vibration sensitive receptors to the quarry, including the GNI gas pipeline, determined there were no exceedances in the specified vibration or air overpressure limits. Regression analysis indicates that at the NSR closest to the proposed new quarry face (approximately 300m from the nearest proposed blasting site), the PPV at the typical maximum MIC of 285 kg would be around 6 mm/s (at 95% CL), below the permitted threshold of 12 mm/s. The measured air overpressure levels were substantially lower than the levels which would see structural damage to windows. The predicted vibration impact due to blasting is predicted to be negligible to low adverse, depending on the proximity to the blast site, which is ***not significant***.

When taking into account the predicted absolute noise level, the change in ambient noise level and the likely vibration level due to blasting, the overall magnitude of impact at each receptor is ***not significant***.

Noise from operational activities associated with other quarries in the vicinity of the Site were ascertained to be imperceptible at all measurement locations. As such, the cumulative impact is **not significant.**

Potential noise and vibration impacts will be controlled by the continued implementation of mitigation measures at the quarry. Supplementary measures have been proposed to ensure that blasting is monitored appropriately, and potential impacts associated with the GNI pipeline are considered. With these mitigation measures in place, residual noise and vibration impacts due to proposed quarry operations have been determined to be ***not significant***.

9.13 REFERENCES

Environmental Impact Assessments of Projects Guidance on the Preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU). European Commission 2018.

EU Environmental Impact Assessment Directive (Council Directive 2014/52/EU).

Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, Department of Environment, Community and Local Government, 2018.

Department of the Environment, Quarries and Ancillary Activities, Guidelines for Planning Authorities 2004.

Kildare County Development Plan 2017 – 2023.

Environmental Code (Irish Concrete Federation, 2005).

Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR). Environmental Protection Agency, Johnstown Castle Estate, Co. Wexford, Ireland. EPA. 2017.

Draft Advice Notes for preparing Environmental Impact Statements. Environmental Protection Agency, Johnstown Castle Estate, Co. Wexford, Ireland. EPA. 2015.

Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4), Environmental Protection Agency (EPA), Office of Environmental Enforcement (OEE), 2016.

Environmental Effects of Blasting - Recent Experiences. International Mining and Minerals. 1, 4, 94-99, Farnfield, R.A., 1998.

BS 4142:2014 Method for Rating and Assessing Industrial and Commercial Sound.

BS 8233:2014 Guidance on sound insulation and noise reduction for buildings.

Guidelines for Environmental Noise Impact Assessment, Institute of Environmental Management and Assessment, 2014.

BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1: Noise

BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 2: Vibration

BS 64722:2008 Guide to evaluation of human exposure to vibration in buildings, Part 2: Blast-induced vibration

BS 7385-1:1990 - Evaluation and measurement for vibrations in buildings, Part 1: Guide for measurement of vibrations and evaluation of their effects on buildings.

BS 7385-2:1993 - Evaluation and measurement for vibrations in buildings, Part 2: Guide to damage levels from groundborne vibration.

BS 7445-1:2003 Description and Measurement of Environmental Noise. Guide to Quantities and Procedures.

Design Manual for Roads and Bridges (DMRB) LA 111 Noise and vibration (revision 2), 2020

Appendix 9A

GLOSSARY OF ACOUSTICS TERMINOLOGY

GLOSSARY OF ACOUSTICS TERMINOLOGY

Ambient sound	The totally encompassing sound in a given situation, at a given time, including sound from any source in any direction.
Area source	A real or theoretical source that radiates as a planar surface. Sound from an area source at close range is radiated as plane waves rather than spherical waves, close range being considered as where the source is large relative to the wavelength of the sound produced. In the far field, the sound waves from an area source become spherical.
A-Weighting	The human ear can detect a wide range of frequencies, from 20Hz to 20kHz, but it is more sensitive to some frequencies than others. Generally, the ear is most sensitive to frequencies in the range 1 to 4 kHz. The A-weighting is a filter that can be applied to measured results at varying frequencies, to mimic the frequency response of the human ear, and therefore better represent the likely perceived loudness of the sound. SPL readings with the A-weighting applied are represented in dB(A).
Background sound	A component of the ambient and residual sound, comprising the steady sounds underlying sources that fluctuate in level within a period of consideration. This can be evaluated using the L_{A90} metric.
Band-Pass Filter	A band-pass filter allows defined sound frequencies with a certain range (or band) to pass with little or no impediment, while removing or impeding any other frequencies in the signal.
Decibel (dB)	The decibel scale is used in relation to sound because it is a logarithmic rather than a linear scale. The decibel scale compares the level of a sound relative to another. The human ear can detect a wide range of sound pressures, typically between $2x10^{-5}$ and 200 Pa, so the logarithmic scale is used to quantify these levels using a more manageable range of values.
Equivalent Continuous Level ($L_{eq,T}$)	The Equivalent Continuous Level represents a theoretical continuous sound, over a stated time period, T, which contains the same amount of energy as a number of sound events occurring within that time, or a source that fluctuates in level. For example, a noise source with an SPL of 80 dB(A) operating for two hours during an eight-hour working day, has an equivalent A-weighted continuous level over eight hours of 74 dB, or $L_{Aeq,8hrs}$ = 74 dB. The time period over which the L_{eq} is calculated should always be stated.

Level Envelope	The envelope of a signal describes its variation in amplitude over time, and 'encloses' the short-term variation in instantaneous signal levels.
Line Source	A theoretical source of sound, with length only, often used to model long, thin sound sources, such as roads.
Loudness	The loudness of a sound is subjective and differs from person to person. The human ear perceives loudness in a logarithmic fashion, hence the suitability of the decibel scale. Generally, a perceived doubling or halving of loudness will correspond to an increase or decrease in SPL of 10dB. Note that a doubling of sound energy corresponds to an increase in SPL of only 3dB.
L_{10}, L_{90} and other L_n percentile-based measures	Percentile measures express statistical measures of noise: L_{10} represents the SPL exceeded for 10% of the time period considered; L10 is often used to describe typical noise levels of road traffic. L_{90} represents the SPL which is exceeded for 90% of the time, expressed in dB or dB(A); L_{A90} is used to quantify underlying 'background sound' levels. Other percentile-based measures are sometimes used for various types of noise assessment. These include L_{01}, L_{50}, L_{99}.
L_{den}	The day-evening-night noise level, also known as the day-evening-night noise indicator, is the A-weighted L_{eq} (equivalent continuous level) over a whole day, but with a penalty of 10 dB(A) for night-time noise (23.00-07.00) and 5 dB(A) for evening noise (19.00-23.00).
L_{night}	The night noise level, also known as the night noise indicator, is the A-weighted, L_{eq} (equivalent noise level) over the 8-hour night period of 23.00 to 07.00 hours.
Masking Noise	The human perception of a sound is affected by the presence of other audible sounds. Noise can provide masking for sounds that would otherwise be more clearly perceived. A masked sound may appear less distinct or may even not be detectable at all by a listener when a masking noise is present. In some situations, such as wind farms with residential neighbours, some masking noise (such as wind blowing through local vegetation) may be desirable.
Maximum Sound Level (L_{max})	The maximum sound level, L_{max} (or L_{Amax} if A-weighted) is the highest SPL that occurs during a given event or time period.
Minimum Sound Level (L_{min})	Similarly, the minimum sound level, L_{min} (or L_{Amin} if A-weighted) is the lowest SPL that occurs during a given event or time period.
Noise	A noise can be described as an unwanted sound. Noise can cause nuisance.

Noise Sensitive Receptors (NSRs)	Any identified receptor likely to be affected by noise. These are generally human receptors and may include residential dwellings, work places, schools, hospitals, community facilities, places of worship and recreational spaces.
Octave	In reference to the frequency of a sound, an octave describes the difference between a given frequency and that which is double that frequency, e.g. 125Hz to 500Hz, or 4kHz to 8kHz.
Octave Band / Third Octave Bands	A sound made up of more than one frequency can be described using a frequency spectrum, which shows the relative magnitude of the different frequencies within it. The possible range of frequencies is continuous, but can be split up into discrete bands, often an octave or third-octave in width. Each octave band is referred to by its centre frequency, generally 63Hz, 125Hz, 250Hz, 500Hz, 1kHz etc.
Point Source	A theoretical source of sound, with zero size and mass, often used as an approximation to model small sources. Sound from a point source radiates spherically in all directions.
Residual Sound	Another component of the ambient sound, associated with any sources other than the specific source(s) under consideration.
RMS	Root-mean-square. Instantaneous sound pressure can take positive or negative values around the mean (atmospheric pressure). To describe the energy in pressure waves the instantaneous pressure is squared and averaged over a finite time interval. The square root reduces the mean-square value to linear, rather than squared, units.
Sound Power Level (SWL)	The Sound Power Level defines the rate at which sound energy is emitted by a source and is also expressed in dB. It is defined as follows: SWL (dB) = 10 $Log_{10}(W/W_{ref})$ Where W = Sound Power (in Watts) W_{ref} = Reference Power 1 picoWatt

Sound Pressure Level (SPL)	The Sound Pressure Level has units of decibels and compares the level of a sound to the smallest sound pressure generally perceptible by the human ear, or the reference pressure. It is defined as follows: SPL (dB) = 10 $Log_{10}(P/P_{ref})^2$ Where P = RMS Sound Pressure (in Pa) P_{ref} = Reference Pressure $2x10^{-5}$ Pa An SPL of 0dB suggests the Sound Pressure is equal to the reference pressure. This is known as the *threshold of hearing.* An SPL of 140dB represents the *threshold of pain.*
Specific Sound	A component of the ambient sound, associated with a specific source/s under consideration.
Spectral content	Sounds are typically made up of acoustic energy present in many frequencies of the audible spectrum. The frequency spectrum describes this signal 'content'.
Time Weighting	The sound pressure level is calculated from the root-mean-square (RMS) value of the instantaneous acoustic pressure. Calculation of the RMS value requires a finite time interval over which to calculate the mean. Sound level meters use a time-weighted average, which multiplies the squared pressure sample by an exponential function of the constant time interval over which the average is calculated. Standard time constants in current use include 'Fast', 'Slow', and 'Impulse' which have values of 0.125s, 1s, and 0.035s respectively. The weighting used is designated by subscripts attached to a level descriptor, e.g. $L_{p,F}$; L_{Smax} etc. The L_{eq} is not a time-weighted level descriptor.

Vibration	Vibration is defined as a repetitive oscillatory motion. Vibration can be transmitted to the human body through the supporting surfaces; the feet of a standing person, the buttocks, back and feet of a seated person or the supporting area of a recumbent person. In most situations, entry into the human body will be through the supporting ground or through the supporting floors of a building. Vibration is often complex, containing many frequencies, occurring in many directions and changing over time. There are many factors that influence human response to vibration. Physical factors include vibration magnitude, vibration frequency, vibration axis, duration, point of entry into the human body and posture of the human body. Other factors include the exposed persons experience, expectation, arousal and activity. Experience shows that disturbance or annoyance from vibration in residential situations is likely to arise when the magnitude of vibration is only slightly in excess of the threshold of perception.

Vibration and Blasting Terminology	
Air Overpressure	The energy transmitted within the atmosphere from a blast site in the form of pressure waves, comprising both audible (noise) and inaudible (concussion) energy. Measured in linear decibels, dB(lin).
Maximum Instantaneous Charge (MIC)	Maximum amount of explosive detonated on any one delay interval. Measured in kg.
Peak Particle Velocity (PPV)	The maximum instantaneous velocity of a particle at a point during a given time interval, usually stated in mm/s.
Vibration Sensitive Receptors (VSRs)	Any identified receptor likely to be affected by vibration. As with noise, these are generally human receptors and may include residential dwellings, work places, schools, hospitals, community facilities, places of worship and recreational spaces.

Appendix 9B

NOISE MONITORING DATA, APRIL 2019 – JANUARY 2024

Public

Monitoring Location	Date	Time (start of measurement)	Duration	Day-time Limit $L_{Aeq,T}$	$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$
N1K	05/04/2019	15:25	00:30	55	66.4	71.8	38.8
N1K	23/08/2019	12:58	00:30	55	64.6	69.8	45.1
N1K	17/09/2019	11:17	00:30	55	62.3	68.0	35.8
N1K	29/10/2019	12:28	00:30	55	60.7	66.0	45.5
N1K	05/03/2020	10:27	00:30	55	56.4	61.7	36.3
N1K	23/08/2020	12:59	00:30	55	64.6	69.8	45.1
N1K	30/04/2021	12:45	00:30	55	59.4	63.9	41.5
N1K	16/11/2021	11:28	00:30	55	60.2	65.1	42.4
N1K	28/07/2022	10:19	00:30	55	53.3	58.1	32.7
N1K	28/10/2022	15:16	00:30	55	50.5	54.3	42.4
N1K	04/04/2023	15:53	01:00	55	66.3	70.7	49.8
N1K	01/06/2023	12:14	01:00	55	57.2	74.4	42.6
N1K	04/08/2023	16:55	01:00	55	53.8	57.9	38.6
N1K	10/10/2023	10:00	01:00	55	53.2	57.9	37.1
N1K	29/11/2023	12:18	01:00	55	53.1	57.7	40.7
N1K	08/01/2024	15:58	01:00	55	54.9	59.0	45.3
N2K	05/04/2019	11:56	00:30	55	43.3	46.1	38.5
N2K	23/08/2019	16:26	00:30	55	47.3	49.5	42.1
N2K	17/09/2019	12:57	00:30	55	39.1	41.2	30.9
N2K	29/10/2019	15:27	00:30	55	46.5	48.9	42.7
N2K	05/03/2020	12:26	00:30	55	59.1	43.8	34.3
N2K	23/08/2020	16:26	00:30	55	47.3	49.5	42.1
N2K	30/04/2021	09:56	00:30	55	41.5	45.5	31.9
N2K	16/11/2021	13:57	00:30	55	53.8	50.0	41.4
N2K	28/07/2022	12:15	00:30	55	42.5	46.3	34.1
N2K	28/10/2022	14:07	00:30	55	46.9	49.8	40.6
N2K	04/04/2023	12:44	01:00	55	49.7	51.8	42.4
N2K	31/05/2023	16:28	01:00	55	49.4	68.7	38.5
N2K	04/08/2023	14:26	01:00	55	45.8	45.1	37.6
N2K	10/10/2023	14:59	01:00	55	46.1	48.3	41.0
N2K	29/11/2023	15:11	01:00	55	46.1	48.1	40.1
N2K	08/01/2024	17:41	01:00	55	43.9	46.7	36.9
N3K	05/04/2019	12:33	00:30	55	39.6	39.7	33.3
N3K	23/08/2019	15:51	00:30	55	48.2	50.7	44.1
N3K	17/09/2019	13:32	00:30	55	34.0	35.4	27.4
N3K	29/10/2019	13:43	00:30	55	46.0	48.5	41.6
N3K	05/03/2020	11:32	00:30	55	36.3	37.4	30.4
N3K	23/08/2020	15:52	00:30	55	48.2	50.7	44.1
N3K	30/04/2021	11:16	00:30	55	42.6	45.8	34.5
N3K	16/11/2021	14:37	00:30	55	46.7	49.2	42.8
N3K	28/07/2022	11:26	00:30	55	36.2	38.6	29.7
N3K	28/10/2022	14:42	00:30	55	51.4	50.8	42.6
N3K	04/04/2023	14:07	01:00	55	51.1	54.2	45.1
N3K	31/05/2023	14:56	01:00	55	43.9	66.4	38.5
N3K	04/08/2023	15:32	01:00	55	46.2	45.6	36.9

Monitoring Location	Date	Time (start of measurement)	Duration	Day-time Limit $L_{Aeq,T}$	$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$
N3K	10/10/2023	16:19	01:00	55	46.7	48.5	42.2
N3K	29/11/2023	13:51	01:00	55	37.2	39.7	31.3
N3K	08/01/2024	14:30	01:00	55	45.4	44.3	37.7
N4K	05/04/2019	13:36	00:30	55	43.6	45.7	40.8
N4K	23/08/2019	13:50	00:30	55	50.4	52.2	47.4
N4K	17/09/2019	12:18	00:30	55	46.8	48.9	40.9
N4K	29/10/2019	16:39	00:30	55	46.9	48.4	44.0
N4K	05/03/2020	16:07	00:30	55	46.5	47.3	43.2
N4K	23/08/2020	13:50	00:30	55	50.4	52.2	47.4
N4K	30/04/2021	14:01	00:30	55	40.0	41.5	35.8
N4K	16/11/2021	13:13	00:30	55	47.8	49.0	44.7
N4K	28/07/2022	13:37	00:30	55	44.3	48.4	37.0
N4K	28/10/2022	12:14	00:15	55	47.6	47.3	37.3
N4K	28/10/2022	12:29	00:15	55	46.5	46.5	36.4
N4K	04/04/2023	11:13	01:00	55	49.0	51.7	44.3
N4K	31/05/2023	12:49	01:00	55	47.7	78.6	36.5
N4K	04/08/2023	13:09	01:00	55	40.8	41.7	35.1
N4K	10/10/2023	11:50	01:00	55	49.8	50.6	44.0
N4K	29/11/2023	10:44	01:00	55	39.1	39.6	34.1
N4K	08/01/2024	12:44	01:00	55	45.0	42.6	36.8
N5K	05/04/2019	14:28	00:30	55	49.9	53.0	42.5
N5K	23/08/2019	14:40	00:30	55	50.1	53.2	43.6
N5K	17/09/2019	14:21	00:30	55	45.4	48.3	37.6
N5K	29/10/2019	15:45	00:30	55	47.7	50.5	42.1
N5K	05/03/2020	16:00	00:30	55	47.2	60.9	38.9
N5K	23/08/2020	14:40	00:30	55	50.1	53.2	43.6
N5K	30/04/2021	15:21	00:30	55	41.0	42.4	35.1
N5K	16/11/2021	12:34	00:30	55	47.8	49.9	43.5
N5K	28/07/2022	12:55	00:30	55	41.7	43.8	38.8
N5K	28/10/2022	11:39	00:15	55	44.8	46.9	40.2
N5K	28/10/2022	11:54	00:15	55	45.5	47.6	39.8
N5K	04/04/2023	09:40	01:00	55	60.0	62.6	54.8
N5K	01/06/2023	10:19	01:00	55	52.0	71.3	44.6
N5K	04/08/2023	10:18	01:00	55	54.9	56.9	51.0
N5K	10/10/2023	13:26	01:00	55	47.3	49.6	41.7
N5K	29/11/2023	09:08	01:00	55	50.7	52.8	46.8
N5K	08/01/2024	10:43	01:00	55	55.5	56.6	49.3

Appendix 9C

VIBRATION MONITORING DATA, FEBRUARY 2018 – AUGUST 2020

Location of Seismograph	Date	Relative Position to Blast (degrees)	Distance (m)	AOP, dB(lin)	PPV, mm/s Transverse	PPV, mm/s Vertical	PPV, mm/s Horizontal	Company	No. of Holes	Diam. mm	Inclination, °	Depth, m	Burden, m	Spacing, m	Total Charge, kg	No. of Delays	Max. Inst. Charge, kg
Gas pipeline	10/06/2020	131	428	111	1.400	1.000	1.000										
Gas pipeline	09/07/2020	138	396	111	0.762	0.635	1.143	IIE Ltd	80	110	0-5	13.2	7.7	3.3	3750	74	105
Gas pipeline	20/07/2020	98	320	117.9	3.110	2.480	4.060	IIE Ltd	44	108	0	12.5	3.5	4230	44	115	
Gas pipeline	20/07/2020	NA	NA	117.9	3.112	2.477	4.064										
Gas pipeline	07/08/2020	95	317	120	6.000	2.500	3.100	IIE Ltd	49	106	0-6	15.3	6.5	3.5	6207	49	145
Gas pipeline	07/08/2020	NA	317	120	6.000	2.500	3.100										
Gas pipeline	31/08/2020	94	321	120.1	4.000	2.100	3.810	IIE Ltd	37	108	0-14	14.5	7	4	4294	37	132
V1	13/02/2018	n/a	n/a	Non-Trigger Event	-	-	-	Rock Solutions									
V1	13/03/2018	n/a	n/a	Non-Trigger Event	-	-	-	Rock Solutions									
V1	30/05/2018	n/a	n/a	Non-Trigger Event	-	-	-	Rock Solutions									
V1	13/09/2018	212	770	121.2	1.58	1.27	1.01	IIE Ltd	27	110/127	5-20°	22	9.5	5.3	6,184	26	275
V1	19/10/2018	222	744	113.3	0.95	0.69	1.01	IIE Ltd	46	110	0°	16	6.8	4.2	7,210	46	175
V1	20/11/2018	223	764	109.9	1.01	0.82	0.57	IIE Ltd	40	110	0-10°	18	7.5	5	6,370	40	180
V1	12/12/2018	227	781	98	0.69	0.63	0.38	IIE Ltd	22	110	0°	18.5	6.7	4	3,654	23	180
V1	07/01/2019	228	770	117	0.80	0.80	1.00	IIE Ltd	45	108	0 - 43°	17.4	8.5	3.8	5,320	41	155
V1	21/01/2019	230	794	115	0.57	0.57	0.50	IIE Ltd	29	110	0 °	20	7	4	5,407	29	200
V1	26/04/2019	222	828	117	1.08	0.82	1.14	IIE Ltd									
V1	05/07/2019	230	759	108	0.50	0.63	0.63	IIE Ltd	34	110	0°	20	7.2	4	3,430	32	190
V1	17/07/2019	215	800	114	1.10	0.80	0.80	IIE Ltd	56	110	0°	19.5	7	4.3	8,820	56	205
V1	19/08/2019	221	796	101.9	0.88	0.76	0.82	IIE Ltd	32	110	0-10°	20	7.6	3.9	5,190	28	200
V1	19/09/2019	224	880	91	0.50	0.51	0.63	IIE Ltd	30	110	0-10°	16.6	9.38	4	4,270	30	150
V1	08/10/2019	224	810	<120	<0.51	<0.51	<0.51	IIE Ltd	22	105	0°	12.5	12	3.7	2,405	22	115
V1	18/10/2019	220	825	106.5	0.44	0.88	0.69	IIE Ltd	54	110	0-15°	16.2	6.9	4.3	7,670	53	155
V1	31/10/2019	230	800	124.8	1.46	1.21	0.83	IIE Ltd	36+13	105	5-23°	28	10	4	8,476	38+8	285
V1	21/11/2019	220	780	120.8	0.63	0.88	0.63	IIE Ltd	54	110	0-20°	16.8	7	4.3	7,304	55	155
V1	02/12/2019	224	792	88	0.50	0.57	0.31	IIE Ltd	21	110	10-20°	20	8.9	3.7	3,300	20	200
V1	17/01/2020	130	805	118.7	0.57	0.45	0.70	IIE Ltd	35	108	8-12°	21.5	10.4	4.2	6,182	35	225
V1	11/02/2020	218	757	121	0.064	0.064	0.064	IIE Ltd	17	110	0-13°	11.5	8.6	4	1,108	15	96
V1	17/02/2020	230	759	103	0.25	0.38	1.39	IIE Ltd	32	110	0-15°	11.2	7.35	4	1,181	32	85
V1	09/03/2020	230	780	116	0.630	1.140	0.570	IIE Ltd	48	110	0-25°	21	3.3	3.8	6,190	40	205
V1	20/03/2020	NA	889	108.8	0.696	0.826	1.143										
V1	08/04/2020	232	4141	<116	<0.5	<0.5	<0.5	IIE Ltd	80	110	0	13.8	6.2	4	6237	78	120
V1	10/06/2020	236	703	105	0.889	0.572	0.445										
V1	20/07/2020	251	653	111	1.000	1.400	1.400	IIE Ltd	44	108	0	12.5	3.5	4230	44	115	
V1	20/07/2020	NA	NA	111	1.000	1.400	1.400										
V1	07/08/2020	250	656	110	2.200	1.800	1.800	IIE Ltd	49	106	0-6	15.3	6.5	3.5	6207	49	145
V1	31/08/2020	252	656	104.9	2.160	1.650	1.590	IIE Ltd	37	108	0-14	14.5	7	4	4294	37	132

Location of Seismograph	Date	Relative Position to Blast (degrees)	Distance (m)	AOP, dB(lin)	PPV, mm/s Transverse	PPV, mm/s Vertical	PPV, mm/s Horizontal	Company	No. of Holes	Diam. mm	Inclination, °	Depth, m	Burden, m	Spacing, m	Total Charge, kg	No. of Delays	Max. Inst. Charge, kg
V2	13/03/2018	n/a	n/a	Non-Trigger Event	-	-	-	Rock Solutions									
V2	19/04/2018	n/a	n/a	Non-Trigger Event	-	-	-	Rock Solutions									
V2	03/05/2018	n/a	n/a	Non-Trigger Event	-	-	-	Rock Solutions									
V2	18/06/2018	n/a	n/a	Non-Trigger Event	-	-	-	Rock Solutions									
V2	13/09/2018	118	820	114.4	1.20	0.85	1.14	IIE Ltd	27	110/127	5-20°	22	9.5	5.3	6,184	26	275
V2	19/10/2018	100	765	104.2	1.20	0.76	0.82	IIE Ltd	46	110	0°	16	6.8	4.2	7,210	46	175
V2	20/11/2018	115	849	110.2	0.63	0.57	0.57	IIE Ltd	40	110	0-10°	18	7.5	5	6,370	40	180
V2	12/12/2018	108	813	<90	0.40	0.60	0.60	IIE Ltd	22	110	0°	18.5	6.7	4	3,654	23	180
V2	07/01/2019	107	820	102.8	0.57	0.44	0.57	IIE Ltd	45	108	0 - 43°	17.4	8.5	3.8	5,320	41	155
V2	21/01/2019	106	809	94	0.88	0.57	0.38	IIE Ltd	29	110	0 °	20	7	4	5,407	29	200
V2	06/02/2019	108.41	926	<120	<0.5	<0.5	<0.5	IIE Ltd	39	105	0 °	15	8	3.6	4,019	37	132
V2	26/04/2019	103	776	99	0.50	0.50	0.72	IIE Ltd									
V2	07/06/2019	111	868	96	0.38	0.63	0.76	IIE Ltd	35	110	0 - 5°	20.4	7	3.3	6,867	35	200
V2	05/07/2019	106	816	88	0.63	0.50	0.76	IIE Ltd	34	110	0°	20	7.2	4	3,430	32	190
V2	17/07/2019	129	846	112	0.69	0.40	0.70	IIE Ltd	56	110	0°	19.5	7	4.3	8,820	56	205
V2	19/08/2019	331	907	<120	<0.5	<0.5	<0.5	IIE Ltd	32	110	0-10°	20	7.6	3.9	5,190	28	200
V2	19/09/2019	110	870	94	0.57	0.38	0.63	IIE Ltd	30	110	0-10°	16.6	9.38	4	4,270	30	150
V2	18/10/2019	110	870	104.2	0.95	0.69	0.82	IIE Ltd	54	110	0-15°	16.2	6.9	4.3	7,670	53	155
V2	21/11/2019	115	910	<120	<0.5	<0.5	<0.5	IIE Ltd	54	110	0-20°	16.8	7	4.3	7,304	55	155
V2	17/01/2020	106	780	112.3	0.94	0.45	0.79	IIE Ltd	35	108	8-12°	21.5	10.4	4.2	6,182	35	225
V2	17/02/2020	106	800	No reading	<0.5	<0.5	<0.5	IIE Ltd	32	110	0-15°	11.2	7.35	4	1,181	32	85
V2	20/03/2020	Na	755	106.5	0.826	0.889	1.080										
V2	10/06/2020	99	767	<115	<0.51	<0.51	<0.51	IIE Ltd	59	110	0	9	8.3	3	2992	59	70
V2	20/07/2020	85	765	107	1.000	0.800	0.800	IIE Ltd	44	108	0	12.5	3.5	4230	44	115	
V2	20/07/2020	NA	NA	107	1.000	0.800	0.800										
V2	31/08/2020	88	763	107	1.200	0.800	1.400	IIE Ltd	37	108	0-14	14.5	7	4	4294	37	132

Location of Seismograph	Date	Relative Position to Blast (degrees)	Distance (m)	AOP, dB(lin)	PPV, mm/s Transverse	PPV, mm/s Vertical	PPV, mm/s Horizontal	Company	No. of Holes	Diam. mm	Inclination, °	Depth, m	Burden, m	Spacing, m	Total Charge, kg	No. of Delays	
V3	13/02/2018	n/a	n/a	Non-Trigger Event	-	-	-	Rock Solutions									
V3	14/05/2018	n/a	n/a	Non-Trigger Event	-	-	-	Rock Solutions									
V3	30/05/2018	n/a	n/a	Non-Trigger Event	-	-	-	Rock Solutions									
V3	20/11/2018	160	337	108	1.01	1.14	0.88	IIE Ltd	40	110	0-10°	18	7.5	5	6,370	40	180
V3	07/01/2019	99	719	104.2	0.89	1.08	1.14	IIE Ltd	45	108	0 - 43°	17.4	8.5	3.8	5,320	41	155
V3	26/04/2019	95	665	109	0.88	0.88	1.01	IIE Ltd									
V3	07/06/2019	105	747	108	1.14	0.88	1.01	IIE Ltd	35	110	0 - 5°	20.4	7	3.3	6,867	35	200
V3	08/10/2019	106	696	97.5	0.38	0.44	0.70	IIE Ltd	22	105	0°	12.5	12	3.7	2,405	22	115
V3	31/10/2019	106	683	113.1	2.10	1.46	1.65	IIE Ltd	36+13	105	5-23°	28	10	4	8,476	38+8	285
V3	02/12/2019	101	699	106	0.76	0.50	0.31	IIE Ltd	21	110	10-20°	20	8.9	3.7	3,300	20	200
V3	11/02/2020	101	815	<120	<0.5	<0.5	<0.5	IIE Ltd	17	110	0-13°	11.5	8.6	4	1,108	15	96
V3	09/03/2020	100	680	104	1.07	0.63	0.63	IIE Ltd	48	110	0-25°	21	3.3	3.8	6,190	40	205
V3	08/04/2020	97	640	108	0.820	0.950	0.950	IIE Ltd	80	110	0	13.8	6.2	4	6237	78	120
V3	08/04/2020	NA	NA	108	0.826	0.953	0.953										
V3	09/07/2020	95	625	106.5	0.699	0.381	0.381	IIE Ltd	80	110	0-5	13.2	7.7	3.3	3750	74	105
V3	07/08/2020	73	690	113	2.200	1.800	2.000	IIE Ltd	49	106	0-6	15.3	6.5	3.5	6207	49	145
V4	06/02/2019	111.32	817	<120	<0.5	<0.5	<0.5	IIE Ltd	39	105	0 °	15	8	3.6	4,019	37	132
V4	07/08/2020	106	710	114	1.080	1.270	1.270	IIE Ltd	49	106	0-6	15.3	6.5	3.5	6207	49	145
V4	07/08/2020	NA	NA	114	1.080	1.270	1.270										
V5	19/04/2018	n/a	n/a	Non-Trigger Event	-	-	-	Rock Solutions									
V5	08/04/2020	220	1320	<117	<0.5	<0.5	<0.5	IIE Ltd	80	110	0	13.8	6.2	4	6237	78	120
V5	31/08/2020	227	1170	93	0.400	1.000	0.800	IIE Ltd	37	108	0-14	14.5	7	4	4294	37	132

10

CULTURAL HERITAGE

10 CULTURAL HERITAGE

10.1 INTRODUCTION

This chapter of the Environmental Impact Assessment Report (EIAR), addresses the effects on the archaeological, architectural and cultural heritage of the application site and the surrounding area of a proposal to further development of an existing quarry over approximately 64.0 hectares (ha.) located in the townlands of Athgarrett, Philipstown and Redbog, Co. Kildare.

10.1.1 PROJECT BACKGROUND AND OVERVIEW

The lands the subject of this EIAR (the subject lands) at approximately 95.8 ha (EIA study area) entirely encompasses the Section 37L application area of approximately 64.0 ha. The reserve at this quarry is greywacke rock, overlain by sand and gravel. The reserve is traditionally excavated by blasting and mechanical means, primarily processed by mobile plant at the working face. In this case, however, blasting has not occurred in the period since 07267 expired on 18 September 2020. Excavated material is transported to a centrally located existing administration and processing plant area, that holds further processing plant (washing, screening, grading). This plant and processing area is an established part of the quarry area.

10.1.2 SCOPE OF ASSESSMENT

This study is an assessment of the known or potential cultural heritage resource within a specified study area relating to the proposed development and includes the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the project on the environment, taking into account current knowledge and methods of assessment.

It consists of a collation of existing written and graphic information in order to identify the likely context, character, significance and sensitivity of the known or potential cultural heritage, archaeological and structural resource using an appropriate methodology (EPA 2002, 2003 and 2022).

The criteria and definitions for describing effect is drawn from the 2022 EPA Guidelines Table 3.4 Description of Effects. The study involved detailed investigation of the cultural heritage, archaeological, architectural, and historical background of the application area and the surrounding area. The overall study area extends 1km from the application area and is presented in Figure 10-1.

The area was examined using information from:

- The Kildare County Development Plan 2023-29
- The Wicklow County Development Plan 2022-28
- The Record of Monuments and Places (RMP) for County Kildare
- The Record of Monuments and Places (RMP) for County Wicklow
- The Sites and Monuments Record
- The National Inventory of Architectural Heritage
- Aerial photographs
- Previous investigations
- Cartographic sources
- Documentary sources

Note that although the Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 was signed into law by the President on October 13, 2023, the act had not been commenced at the time this assessment was prepared. This assessment uses the National Monuments Acts 1930-2014, which were still in force at the time the assessment was completed.

A Field inspection was carried out on the 26th of August 2020 and the 8th of January 2024. This involved an inspection of all the lands in the application area.

The assessment was prepared by Dr. Charles Mount who has more than thirty years of cultural heritage assessment experience. He holds B.A., M.A., and Ph.D. degrees in archaeology as well as a professional diploma in EIA and SEA Management and is a member of the Institute of Archaeologists of Ireland an.

An effect assessment and mitigation strategy have been prepared. An effect assessment is undertaken to identify likely significant adverse effects that the proposed development may have on the cultural resource, while a mitigation strategy is designed to avoid, reduce or offset such adverse effects.

10.1.3 LOCATION AND SETTING

The Section 37L application area is located in the townlands of Athgarrett, Philipstown and Redbog Co. Kildare, on OS Six Inch Sheet No. 25, approximately 1.8 km north-west of the town of Blessington and approximately 1.4km north-west of the N81 road.

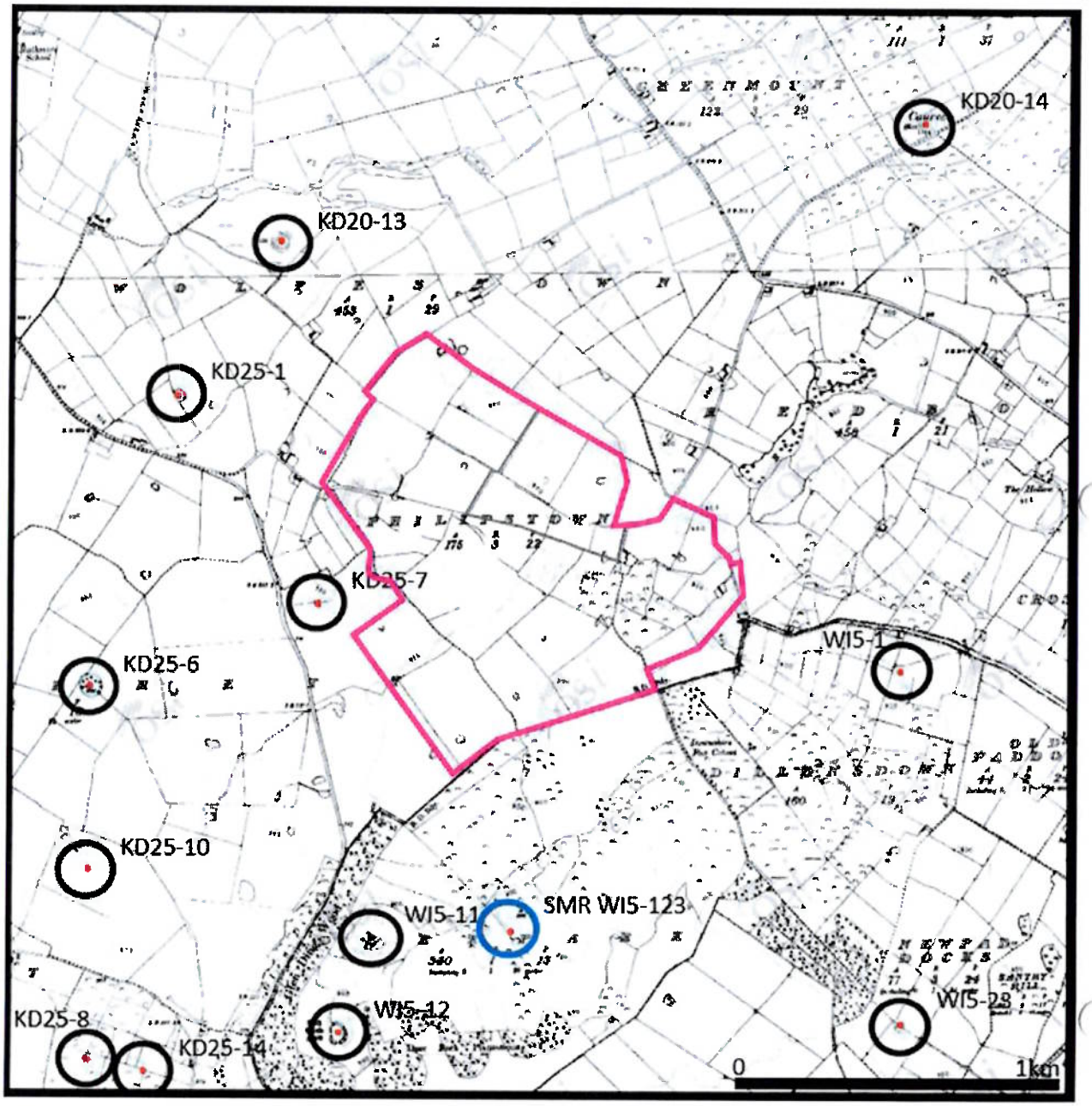

Figure 10-1. The EIA study area is indicated with the purple line. RMPs are indicated with black circles and SMRs with blue circles.

10.2 LEGISLATIVE AND POLICY CONTEXT

10.2.1 LEGISLATION

Apart from the EIA Directive, no specific Irish legislation exists governing cultural heritage assessments.

10.2.2 RELEVANT POLICIES AND PLANS

The County Kildare Development Plan 2023-2029 (CDP) is the statutory plan detailing the development objectives/policies of the local authority. The plan includes objectives and policies, relevant to this assessment, i.e., with regard to cultural heritage.

The Councils aim is to protect, conserve and manage the archaeological and architectural heritage of the county and to encourage sensitive sustainable development so as to ensure its survival and maintenance for future generations

10.2.2.1 Cultural Heritage

Chapter 11 of the Kildare County Development Plan sets out the policies on cultural heritage within the county. The Council recognises the importance of identifying, valuing and safeguarding the archaeological and architectural heritage of Kildare.

Archaeology Resource

The following policy, objectives and actions are set out in Section 11.10 of the KCDP:

Policy AH P2 Protect and enhance archaeological sites, monuments and where appropriate and following detailed assessment, their setting, including those that are listed in the Record of Monuments and Places (RMP) or newly discovered archaeological sites and/or subsurface and underwater archaeological remains.

Objective AH 02 Manage development in a manner that protects and conserves the archaeological heritage of County Kildare, avoids adverse impacts on sites, monuments, features or objects of significant historical or archaeological interest and secures the preservation in-situ or by record of all sites and features of historical and archaeological interest, including underwater cultural heritage. The Council will favour preservation in – situ in accordance with the recommendation of the Framework and Principles for the Protection of Archaeological Heritage (1999) and the Council will seek and have regard to the advice and recommendations of the Department of Housing, Local Government and Heritage.

Objective AH O3 In co-operation with the National Monuments Service, Department of Housing, Local Government and Heritage require archaeological impact assessment, surveys, test excavation and/or monitoring and/or underwater archaeological impact assessments for planning applications in areas of archaeological importance and where a development proposal is likely to impact upon in-situ archaeological monuments, their setting and archaeological deposits, based on recommendations of a suitably qualified archaeologist and the Council will seek and have regard to the advice and recommendations of the Department of Housing, Local Government and Heritage.

Objective AH O4 Ensure that development in the vicinity of a site of archaeological interest is not detrimental to the character of the archaeological site or its setting by reason of its location, scale, bulk or detailing and to ensure that such proposed developments are subject to an archaeological assessment prepared by a suitably qualified archaeologist. Such an assessment will seek to ensure that the development can be sited and designed in such a way as to avoid impacting on archaeological heritage that is of significant interest including previously unknown sites, features, objects and areas of underwater archaeological heritage.

Objective AH O5 Require the preservation of the context, amenity, visual integrity and connection of the setting of archaeological monuments. As a general principle, views to and from archaeological monuments shall not be obscured by inappropriate development. Where appropriate, archaeological visual impact assessments will be required to demonstrate the continued preservation of an archaeological monument's siting and context.

Objective AH O6 Secure the preservation in-situ or by record of:

- the archaeological monuments included in the Record of Monuments and Places as established under section 12 of the National Monuments (Amendment) Act, 1994
- any sites and features of historical and archaeological interest including underwater cultural heritage and protected wrecks.
- any subsurface archaeological features including those underwater, that may be discovered during the course of infrastructural/development works in the operational area of the Plan. Preservation relates to archaeological sites or objects and their settings.

Objective AH O7 Contribute towards the protection and preservation of the archaeological value of underwater or archaeological sites associated with rivers and associated features.

Objective AH O8 Protect historic burial grounds that are recorded monuments and encourage their maintenance in accordance with best conservation principles in co-operation with the Historic Monuments Advisory Committee and the National Monuments Service, Department of Housing, Local Government and Heritage. Development may be restricted or conditions requiring substantial excavation may be imposed in and adjacent to former burial grounds.

Objective AH O9 Promote and support in partnership with the National Monuments Section of the Department of Housing, Local Government and Heritage (DHLGH), the concept of Archaeological Landscapes where areas contain several Recorded Monuments.

Objective AH O10 Require that all development proposals for industrial buildings and sites identified in Kildare Industrial Archaeology Survey (2007) or otherwise identified as being of industrial archaeological importance be accompanied by an industrial archaeology assessment of the surrounding environment. New development should be designed in sympathy with and to protect existing features and structures.

Action AH A2 Where possible, facilitate and enhance public access to and understanding of the archaeological heritage and disseminate archaeological information and advice to prospective developers and the general public.

Action AH A3 Identify appropriate archaeological sites in the Plan area to which public access could be provided and work to secure public access, where appropriate, in consultation with the landowners.

Action AH A4 Support and encourage the provision of signage in Irish and English to publicly accessible recorded monuments.

Action AH A5 Support the implementation of the recommendations of the Curragh Conservation, Management and Interpretation Plan, when prepared, in association with relevant stakeholders, within the lifetime of this Development Plan.

Action AH A6 Encourage and promote the appropriate management and enhancement of archaeological heritage, to include community initiatives.

Features of Historical Interest

The following policy, objectives and actions are set out in Section 11.13 of the KCDP:

Policy AH P5 Secure the identification, protection and conservation of historic items and features of interest throughout the county including street furniture, surface finishes, roadside installations, items of industrial heritage, riverine heritage, and other stand-alone features of interest (items not listed on the RMP or RPS).

Objective AH O19 Ensure that development within the county including Council development retains, refurbishes and incorporates features of historical interest, as deemed appropriate in each instance.

Action AH A9 Develop a database of features of historical interest including street furniture, surface finishes, roadside installations, items of industrial heritage, riverine heritage, and other stand-alone features of interest (items not listed on the RMP or RPS) within villages and towns in County Kildare and ensure they are included in relevant Local Area Plans.

Architectural Heritage

The following policy, objectives and actions are set out in Section 11.15 of the KCDP:

Policy AH P6 Protect, conserve and manage the archaeological and architectural heritage of the county and to encourage sensitive sustainable development in order to ensure its survival, protection and maintenance for future generations.

Objective AH O20 Conserve and protect buildings, structures and sites contained on the Record of Protected Structures of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

Objective AH O21 Protect the curtilage of protected structures or proposed protected structures and to refuse planning permission for inappropriate development that would adversely impact on the setting, curtilage, or attendant grounds of a protected structure, cause loss of or damage to the special character of the protected structure and/or any structures of architectural heritage value within its curtilage. Any proposed development within the curtilage and/or attendant grounds must demonstrate that it is part of an overall strategy for the future conservation of the entire built heritage complex and contributes positively to that aim.

Objective AH O22 Refuse planning permission for the demolition of any protected structure unless the Council is satisfied that exceptional circumstances exist. The demolition of a protected structure with the retention of its façade will likewise not generally be permitted.

Objective AH O23 Require an Architectural Heritage Assessment Report, as described in Appendix B of the Architectural Heritage Protection, Guidelines for Planning Authorities (2011), to accompany all applications with potential for visual or physical impacts on a Protected Structure, its curtilage, demesne and setting. This report should be prepared by a person with conservation expertise that is appropriate to the significance of the historic building or site and the complexity of the proposed works.

Objective AH O24

- Safeguard the amenities of Castletown House including the main avenue, Donaghcumper, St Wolstans and the River Liffey environs as shown on Map V1 - 11.14.
- Safeguard the amenities of The Wonderful Barn including the adjacent buildings.

Objective AH O25 Maintain the views from Castletown House to the River Liffey and to protect the integrity of the designed landscape at Castletown Demesne, including the pathways, avenues, and the following views:

- Axial views between Castletown House and the Conolly Folly, Obelisk.
- Views between Castletown House and the Wonderful Barn including the trees and natural growth areas within same.
- Views from the House to the river and across the back parterre
- Views across the river and to the linked demesnes of Donaghcumper and St. Wolstans.
- Views from the main avenue to, and across, the river towards Castletown, and up and down the river to Celbridge and New Bridges.
- ensuring development does not inappropriately encroach on same.

Objective AH O26 Require that planning applications in proximity to 'Views to be Preserved" are accompanied by a Visual Impact Assessment.

Objective AH O27 Maintain the views to and from Carton House and protect the character of the historic designed landscape within Carton Demesne, as outlined in Map V1 - 11.13.

Objective AH O28 Support the re-development of Clongowes Wood College to ensure the continued and enhanced educational use of this protected structure. Any proposed development within the curtilage and/or attendant grounds must demonstrate that it is part of an overall strategy for the future conservation of the entire complex including the structures, demesne and/or attendant grounds.

Objective AH O29 Preserve and protect the historic, architectural, and military heritage of The Curragh Camp. Ensure that proposed development within the curtilage and/or attendant grounds demonstrates that it is part of an overall strategy to protect the heritage significance of the entire Curragh Camp.

Objective AH O30 Ensure that, in the event of planning permission being granted for development within the curtilage and attendant grounds of a protected structure, a sustainable use and appropriate maintenance plan is in place for the structure and any associated buildings or structures of heritage interest. The proposed works to the protected structure should occur in the first phase of the development to prevent endangerment, abandonment and dereliction of the structure.

Objective AH O31 Protect the designed landscapes associated with protected structures and retain important elements of the built heritage including historic gardens, stone walls, pathways, and avenues within the curtilage and attendant grounds of protected structures.

Objective AH O32 Ensure that new development will not adversely impact on the setting of a protected structure or obscure established views of its principal elevations.

Objective AH O33 Promote best practice and the use of skilled specialist practitioners in the conservation of, and any works to, protected structures. Architectural Heritage Impact Assessment reports should make reference to the DHLGH Advice Series on how best to repair and maintain historic buildings. The AHIA report should summarise the principal impacts on the character and special interest of the structure or site and describe how it is proposed to minimise these impacts. It may also describe how the works have been designed or specified to have regard to the character of the architectural heritage.

Objective AH O34 Encourage high quality design in relation to planning applications that are made for the construction of extensions or new buildings affecting protected structures or older buildings of

architectural merit not included in the RPS. The Council will have regard for the visual impacts on the setting and character of protected structures and/or buildings of architectural merit not included on the RPS, when considering applications on neighbouring sites.

Objective AH O35 Favourably consider the change of use of any structure included on the Record of Protected Structures, where such a change of use does not adversely impact on its intrinsic character or special interest and where such a use may otherwise not conform to the zoning matrix associated with any Local Area Plan.

Objective AH O36 Actively encourage uses that are compatible with the character of protected structures. In certain cases, the Planning Authority may relax site restrictions / development standards in order to secure the preservation and restoration of a protected structure or building of architectural merit that is not included on the RPS.

Objective AH O37 Promote the use of energy upgrade materials and technologies that follow good conservation practice and are compatible with the character and vapour permeable construction of traditionally built structures.

Objective AH O38 Support appropriate and sensitive thermal upgrade of protected structures and other heritage buildings. These works shall be undertaken with the necessary planning permission / statutory declarations with the advice of Kildare County Council's Architectural Conservation Officer.

Objective AH O39 Promote the maintenance and appropriate re-use of buildings of architectural, cultural, historic and aesthetic merit which make a positive contribution to the character, appearance and quality of the streetscape or landscape and the sustainable development of the county. Any works associated with the re-use of such buildings should be carried out in accordance with best conservation practice.

Objective AH O40 Encourage appropriate change of use and reuse of industrial buildings of heritage interest, provided such a change does not seriously impact on the intrinsic character of the structure and that all works are carried out in accordance with best conservation practice.

Objective AH O41 Promote the retention of original or early building fabric including timber sash windows, stonework, brickwork, joinery, render and slate. Likewise, the Council will encourage the re-instatement of historically correct traditional features.

Objective AH O42 Retain where practicable a protected structure which has been damaged by fire, and to retain those elements of that structure that have survived (either in whole or in part) and that contribute to its special interest.

Objective AH O43 Ensure that national guidelines and the principles of conservation best practice are followed in assessing the significance of a Protected Structure and in considering the impact of proposed development on the character and special interest of the structure, its curtilage, demesne and setting.

Objective AH O44 Co-operate with Waterways Ireland in the management, maintenance and enhancement of the Royal Canal and Grand Canal and associated structures/features. Such projects shall be subject to an AA Screening Report, and where applicable, Stage 2 AA. They shall have a regard for any hydrological connection shared with a European Site and their qualifying interest species. The project shall account for any potential likely significant effects and provide mitigation and monitoring where appropriate.

Objective AH O45 Support the implementation of the National Policy on Architecture, 'Places for People' prepared by the Department of Housing, Local Government and Heritage.

Action AH A10 Review and amend on an ongoing basis the Record of Protected Structures and make additions, deletions and corrections as appropriate over the period of this Plan.

Action AH A11 Prepare a Buildings at Risk Register to prevent the endangerment of Protected Structures, historic or vernacular buildings.

Action AH A12 Carry out an audit and assess the condition of all protected structures within the Council's ownership and devise a management plan including a range of proposed uses for these structures, which may include community uses.

Action AH A13 Carry out field surveys of industrial heritage in the county and make recommendations for its protection.

Action AH A14 Carry out an audit of all historic rail and road bridges and disused railway lines in Kildare and liaise with Iarnród Eireann and Transport Infrastructure Ireland regarding the management, maintenance and enhancement of same.

Action AH A15 Carry out a pilot study on the sympathetic re-use of a Protected Structure/ or groups of buildings in an Architectural Conservation Area (ACA) to address high quality residential reuse in historic urban cores of towns and villages.

10.2.3 RELEVANT GUIDANCE

The report format and some of the descriptions of effects are based on the Guidelines on the Information to be contained in Environmental Impact Assessment Reports, published by the Environmental Protection Agency (EPA) in 2022

10.3 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

This study which complies with the requirements of Directive EIA 2014/52/EU is an assessment of the known or potential cultural heritage resource within a specified area and includes the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the project on the environment, taking into account current knowledge and methods of assessment. It consists of a collation of existing written and graphic information in order to identify the likely context, character, significance and sensitivity of the known or potential cultural heritage, archaeological and structural resource using an appropriate methodology (EPA 2002, 2003 and 2022).

The criteria and definitions for describing effects set out below is drawn from the 2022 EPA Guidelines.

Table 10-1 – Effect criteria and definitions, EPA EIAR Guidelines 2022.

Quality of Effects	**Positive:** A change which improves the quality of the environment.
	Neutral: No effects or effects that are imperceptible, within normal bounds or variation or within the margin of forecasting error.
	Negative/adverse effects: A change which reduces the quality of the environment.
Significance of effects	**Imperceptible:** An effect capable of measurement but without noticeable consequences.
	Not significant: An effect which causes noticeable changes in the character of the environment but without noticeable consequences.
	Slight effects: An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate effects: An effect that alters the character of the environment in a manner that is consistent with existing and emerging trends.
	Significant effects: An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant effects: An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.
	Profound effects: An effect which obliterates sensitive characteristics
Describing extent & context of effects	**Extent:** Describe the size of the area, the number of sites, and the proportion of population affected by an effect.
	Context: Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions.
Describing Probability of effects	**Likely effects:** The effects can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely effects: The effects can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing duration & frequency of effects	Momentary effects: Effects lasting from seconds to minutes.
	Brief effects: Effects lasting less than a day.
	Temporary effects: Effects lasting less than a year.
	Short-term effects: Effects lasting one to seven years.
	Short-term effects: Effects lasting seven to fifteen years.
	Long term-term effects: Effects lasting fifteen to sixty years.
	Permanent effects: Effects lasting over sixty years.
	Reversible effects: Effects that can be undone, for example through remediation or restoration.
	Frequency of effects: Describe how the effect will occur.
Describing the types of effects	**Indirect effects:** Impacts on the environment which are not a direct result of the project.
	Cumulative effects: The addition of minor or significant effects, including effects of other projects, to create a larger more significant effect.
	'Do-Nothing Effects': The environment as it would be in the future should the project not be carried out.
	'Worst case' effects: The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable effects: When the full consequences of a change in the environment cannot be described.
	Irreversible effects: When the character distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual effects: The degree of environmental change that will, occur after the proposed mitigation measures take effect.
	Synergistic effects: Where the resultant effect is of greater significance than the sum of its constituents.

10.4 BASELINE CONDITIONS

10.4.1 THE LANDSCAPE

The Section 37L application area and EIA study area are located in the townlands of Athgarrett, Philipstown and Redbog Co. Kildare, on OS Six Inch Sheet No. 25, approximately 1.4 km north-west of the town of Blessington and approximately 1.4 km north-west of the N81 road. The local soil is a fine loamy drift with limestones overlying drift with limestones (http://gis.teagasc.ie/soils/map.php).

10.4.2 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

The following is a brief summation of the archaeological and historical development of the study area and the main types of sites and monuments that are known from the surrounding landscape. It is intended to place the types of sites and monuments in the study area in context. The EIA study area is situated in the Barony of Naas North and the parish of Rathmore.

10.4.2.1 Prehistoric Period

There are two Bronze Age burials known from the study area in Dillonsdown (RMP WI005-001----) and Athgarrett (RMP KD025-007----) townlands that indicate prehistoric activity in the Bronze Age. There is also ring-barrow (prehistoric burial monument) in Newtownpark (RMP KD025-008----) and a mound in Caureen townland (RMP KD020-014----) that may also be the remains of a prehistoric burial monument (see Appendix 10A).

10.4.2.2 Early medieval period

In the Early Medieval period (500 AD-1170 AD) the study area formed part of the Kingdom of Leinster which was ruled by 68 Kings from various inter-related families from the fifth century AD, commencing with Bressal Belach (died c.436 AD) and ceasing with Diarmait Mac Murchade who died in 1171. The earliest historical dynasty associated with Leinster is the Dal Messin Corb who were by the 7th-8th centuries replaced by the Uí Mail and the Uí Dunlainge. The Uí Dunlainge, who occupied the Liffey Plain to the northwest of the Wicklow Mountains, held the provincial over kingship of Leinster from 738 until 1042, when the Uí Chennselaig assumed the kingship. On the death of Diarmait Mac Murchade, of Uí Chennselaig, Leinster passed, through his daughter, to her husband, Richard fitz Gilbert de Clare, 2nd Earl of Pembroke, who became the first Norman Lord of Leinster. From the Uí Dunlainge are descended the Uí Faelain who had their political centre at Naas and ruled the eastern part of the plain of Airthir Liphi, the Liffey plain (Byrne 1973, 150). There are a number of references to the Uí Faelain in the Annals of the Four Masters commencing in the ninth century and concluding in the thirteenth. Classically settlement in the Early Medieval period is indicated by the presence of enclosed farmsteads known as ringforts. There are ringforts known in Wolfestown (RMP KD025-001----) and Deerpark (RMP WI005-012----) townlands and enclosures in Wolfestown (RMP KD020-013----), Athgarrett (RMP KD025-006----), Newtownpark (RMP KD025-014----), Deerpark (RMP WI005-011----) and Newpaddocks (RMP WI005-023----) Townlands, that may be the remains of ringforts, indicating extensive early medieval settlement in the study area.

10.4.2.3 Medieval period

Diarmaid Mac Murchadha, King of Leinster, Killed the King of Ui-Faelain in 1141 and relations between Ui-Faelain and Murchadha were uneasy throughout the period. In 1166 the Ui-Faelain supported the High-King Ruaidhri OConchobhair's invasion of Ui Cheinnselaig and forced Murchadha to flee to Britain later in the year. He returned the following year aided by Norman mercenaries and retook Ui

Cheinnselaig and the town of Wexford. In 1169 he invaded Ossory and overran the Ui-Faelain lordship. On the death of Diarmaid Mac Murchadha in 1171 his son-in-law Richard fitz Gilbert de Clare claimed the Lordship of Leinster and this was confirmed to him by King Henry II the same year. By the time of his death in 1176, when Leinster passed to King Henry II, the process of sub-infeudation (the granting of lands by lords to their dependents, to be held by feudal tenure) was well under way in much of Leinster. The Ui Faeláin lands in the study area were granted to Maurice FitzGerald who established the manor of Rathmore with its caput and motte and bailey castle to the north of the study area (Otway Ruthven 1980, 43, MacCotter 2008, 174-177). In 1185 John, Lord of Ireland, confirmed the grant of the manor of Rathmore to Maurice FitzGerald (MacNiochaill 1964, 14). In 1293 Rathmore passed to John FitzThomas who subsequently became the Earl of Kildare (MacNiochaill 1964, 67) The Earl's of Kildare held Rathmore until the rebellion of Silken Thomas in 1534.

10.4.2.4 Post-medieval period

Following the Kildare rebellion of 1534, the FitzGerald lands were confiscated by the Royal Government and in 1541 King Henry VIII leased Rathmore, including Phillippiston, Ratynekil, Monfynn, possessions of Earl of Kildare who had been attainted and Haynestown, Agarret, Little Newtown, 3 Castles by the Mountain side and Comyngston, possessions of James FitzGerald, who had been attainted, to Walter Trott (Tudor Fiants Henry VIII No. 184). In 1546 Henry VIII granted John Travers the manor of Ratymore along with Rathtorkyll, Monefyne, Philippeston, Heyneston, Athgarrett and Three Castles near the Mountains (Morrin 1861, 116-7). In 1550 John Travers sold the lands granted him by the King in 1547 to a group consisting of Luke Netterville, Thomas Talbote, Thomas FitzWilliams, Thomas Fyan, Thomas Creafe, Thomas Fleming, Patrick Barnewall and Richard Field. In 1567 John Allen leased Rathmore with Three Castles for 51 years from Queen Elizabeth (Tudor Fiants Elizabeth No. 1087).

The Civil Survey records that John Cheevers held Agarard (Athgarrett) and Redbog along with William Eustace, Edward Allen, Nicholas Sutton, John Seagrave, and Handcocke Long, and William Eustace had Pheelipstownne (Philipstown) in 1640 (Simington 1952). By 1670 Athgarrett and Redbog had come into the hands of Charles Berkeley, Lord Fitzharding and Philipstown was held by Christopher Eustace.

In 1667 the Archbishop of Dublin and Lord Chancellor, Michael Boyle, bought the lordship of Threecastles, previously the property of the Cheevers family for £1,000. Boyle received a Royal Charter to establish the town of Blessington, in the townland of Munfine, as a borough. Construction of Blessington House was begun in 1673 and afterwards St. Mary's Church in Blessington, which was completed in 1683 (Trant 2004, 31-3). At this period the formal gardens of Blessington Demesne and the Deerpark was laid out. On Boyle's death in 1702 his son Morough, Baron Boyle and Viscount Blessington, inherited the Blessington estate. Morough's son, Charles, died in 1732 without an heir and the estate was inherited by his sister Anne, then her son William Stewart, Viscount Mountjoy and Baron Stewart. Stewart died in 1769 without an heir and the estate passed to Charles Dunbar, a great grandson of Morough Boyle, who also died heirless in 1778, when the estate passed to Wills Hill of Hillsborough, Co. Down, a great great grandson of Michael Boyle and the first Marquis of Downshire. The Hills held the estate until 1908 (*Ibid.* 41-5). In 1853 the Kenelm Henry Digby was recorded as holding Philipstown and Redbog and William Cogan held Athgarrett (Primary Valuations for the Poor Law 1853, 153-7).

10.5 SELECTION OF SENSITIVE RECEPTORS

10.5.1 BUILDING ASSESSMENT

10.5.1.1 Designated structures

The Kildare County Development Plan 2023-29 and Wicklow County Development Plan 2022-28 were examined as part of the baseline study for this chapter of the EIAR. The review established that there are no Protected Structures situated within the Section 37L application area or within the EIA study area.

10.5.2 NATIONAL INVENTORY OF ARCHITECTURAL HERITAGE

The National Inventory of Architectural Heritage (NIAH) which is maintained by the Dept. of Culture, Heritage and the Gaeltacht was examined as part of the baseline study for this chapter of the EIAR on the 5th of January 2024. The review established that there are no additional structures included in the NIAH situated within the Section 37L application area or the EIA study area.

10.5.3 MAP INSPECTION

All structures marked on the 1910 edition of the six-inch Ordnance Survey mapping within 300m of the application area were checked for potential field assessment. There are no such structures located in this area (see Figure 10-1).

10.5.4 ARCHAEOLOGICAL ASSESSMENT

10.5.5 RECORDED MONUMENTS

The RMP for Co. Kildare which was established under Section 12 of the National Monuments (Amendment) Act, 1994 was examined as part of the assessment (DAHGI 1997). Note that in accordance with the Historic and Archaeological Heritage and Miscellaneous Provisions Bill 2023 the RMP will be replaced by the Register of Monuments, but the RMP was still legally in force when this assessment was prepared. The closest Recorded Monument to the application the site of a burial (RMP KD025-007---) found in Athgarrett townland during the construction of the Cork-Dublin natural gas pipeline in 1983 and preserved by record (see Figure 10-1 and Appendix 10A). This site is described in the RMP as:

KD025-007---- Burial ATHGARRETT

In undulating pasture. Discovered in 1983 during topsoil-stripping for the construction of the Cork-Dublin natural gas pipeline. Most of a flat-based, bucket-shaped pot containing 'tiny fragments of burnt bone' was found standing upright in a pit of only very slightly larger volume and shape, which may originally have been sealed by a covering stone. While the paucity of the burnt bone led the excavator to caution against interpreting it as a cinerary urn, the form of the vessel suggests a Late Bronze Age date.

This burial no longer exists, it was located 150 m north-west of the study area but will not be directly or indirectly effected by the proposal.

The next closest Recorded Monument in the study area is the site of a Ringfort in Wolfestown townland (KD025-001----). This site is described in the RMP as:

KD025-001---- Ringfort - rath WOLFESTOWN

On a short, moderately steep-sided pasture ridge (WNW-ESE) with an extensive sand/gravel quarry c. 50m to the ENE. A circular area (diam. 30m) is defined by a generally low earthen bank (int. H 0.1-0.6m; Wth 0.8-1.9m; ext H 0.6-2.1m) S-NW-SE which is reduced to a low scarp (H 1m) elsewhere. The enclosing bank is best preserved SSW-W-NW where it is hedged and reused as a field boundary. There is no visible surface trace of a fosse. An arc of spoil and large stones (L 20m; Wth 5m) has been dumped against the enclosing bank at NE. The interior has been partially dug out, leaving an L-shaped depression (L 15m SW-NE; L 12.5m WNW-ESE; Wth 7m).

This monument is located c.750m north-west of the application area and will not be directly or indirectly effected by the proposal. The remaining Recorded Monuments in the study area are located a greater distance to the application area and are considered to be too far distant to be directly or indirectly effected by the proposal.

10.5.6 SITES AND MONUMENTS RECORD

Examination of the Sites and Monuments Record (SMR) which is maintained by the Dept. of Housing, Local Government and Heritage the 5th of January 2024 indicated that that there are no SMRs included within the application area. There is one SMR included within the study area outside the application area. This a deerpark wall (SMR WI005-123----) situated in Deerpark townland (see Appendix 10B). This site is described in the SMR as:

WI005-123---- Deer park DEERPARK
Indicated on the first edition OS 6-inch map. A detailed plan, elevation and photographic record of the north-western boundary of this Deerpark was undertaken in February 2000. This is a 285m length of mortared stone wall, revetting a low bank and internal ditch and defining part of the circuit of the 17th-century deer park.

This Deerpark wall is situated on the southern edge of the study area forming the boundary with Deerpark townland.

10.5.7 CARTOGRAPHIC SOURCES

The Ordnance Survey 1st and 3rd edition six-inch maps and the first edition 25-inch maps of the area were examined. A lime kiln is indicated on the first edition 25-inch maps as 'L.K.' in the area of existing extraction and no longer exists. Otherwise the analysis did not indicate any previously unrecorded archaeological sites in the application area or vicinity.

10.5.8 PLACE NAME EVIDENCE

The place names were extracted from the cartography in order to facilitate the search for structures and monuments and small finds, to help identify any unrecorded monuments or structures, to search for any published papers and documents related to the study area and to assist in the study of the historical development of the area. The English translations of the townland names of the study presented below are based on the Placenames Database of Ireland. The placenames refer to natural and topographic features and proprietors. There are no additional sites or monuments indicated in the application area.

Table 10-2 - Townland Names of the Study Area

Townland	Description
Athgarrett	Garret's ford
Blessington demesne	originally Munfine (white bog) a sub-division of the Downshire Estate
Caureen	possibly little rath
Crosscoolharbour	cross of the corner or angle
Deerpark	park for Deer
Dillonsdown	originally Munfine a sub-division of the Downshire Estate
Greenmount	green hill
Newpaddocks	originally Munfine (white bog) a sub-division of the Downshire Estate
Newtownpark	new parkland
Oldpaddocks	originally Munfine (white bog) a sub-division of the Downshire Estate
Philipstown	land of the Philips family
Rathmore west	great rath
Redbog	red bogland
Slate quarries	Area of slate quarries
Wolfestown	land of the Wolfe family
Athgarrett	Garret's ford

10.5.9 AERIAL PHOTOGRAPHS

Examination of the Ordnance Survey 1995, 2000 and 2005 imagery, a newly commissioned drone survey carried out in March 2020, as well as Google earth imagery from 2009, 2010, 2012, 2013, 2015, 2016, 2018, 2019, 2020 and 2022, and Bing imagery from 2011 did not indicate any additional cultural heritage sites in the application area.

10.5.10 OTHER SOURCES

Examination of archaeological corpus works on prehistoric artefacts (Harbison 1969, Eogan 1965, 1983, 2000, Kavanagh 1991, Mount 1989, Simpson 1990), and pottery (O'Ríordáin and Waddell 1993) and Iron Age material (Raftery 1984) revealed an artefact find from the study area (see Appendix 10C).

10.5.11 NATIONAL MUSEUM OF IRELAND

Examination of the finds registers and topographical files held by the National Museum of Ireland revealed four artefacts from the study area, a macehead found in a sand quarry near Blessington, a

polished stone axes from Deerpark townland, a coarse urn from Deerpark and a saddle quern from the bank of the Kings River (see Appendix 10C).

10.5.12 PREVIOUS ASSESSMENTS

The existing quarry and part of the current application area was the subject of an EIA carried out by Golder Associates that included an assessment of archaeology, architecture and cultural heritage carried out by the Archaeology Company in 2007 (Planning Reg. No. 07/267). The assessment identified no sites of archaeological significance associated with the lands under consideration. The assessment recommended that soil stripping of previously undisturbed land be monitored by a suitably qualified archaeologist. Conditions 53-58 of the 2009 grant of planning permission required that pre-development archaeological testing be carried out at the site.

10.5.13 ARCHAEOLOGICAL INVESTIGATIONS

Examination of the excavations.ie database of Irish excavation reports indicated that there have been three licensed archaeological investigations carried out in the study area. The only heritage identified was a 285 m long stretch of wall enclosing a 17th-century deer park (See Appendix 10D).

10.5.14 FIELD INSPECTION

A Field inspection was carried out on the 26th of August 2020 and the 8th of January 2024. This involved an inspection of all the lands in the application area. The fieldwork areas are numbered on Plate 10.1.

Plate 10.1: June 2018 aerial image of the application are outlined in red from Google Earth with the fieldwork areas numbered.

Area 1

This is the existing area of extraction. All topsoil and subsoil has been removed and there is no surviving archaeological, architectural or cultural heritage material (see Plate 12.1).

Area 2

This is a large generally rectangular-shaped southwest sloping field of pasture enclosed by banks and ditches with mature trees, (Plate 10.2). There is one historical disused quarry pit in the field identifiable on the OSI 25 Inch 1888-1913 mapping. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level.

Plate 10.2: Panoramic view of Area 2 looking east.

Area 3

This is a large trapezoidal-shaped southwest sloping field of pasture enclosed by banks and ditches with mature trees (Plate 10.3). There is one historical disused quarry pit in the field identifiable on the OSI 25 Inch 1888-1913 mapping. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level.

Plate 10.3: Panoramic view of Area 3 looking southwest.

Area 4

This is a four-sided northwest sloping area with internal haul road used to store soil, which is now grassed over (Plate 10.4). There is an agricultural shed on its north edge. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level.

Plate 10.4: View of Area 4 looking northwest.

Area 5

This is a wedge-shaped area that has been stripped of topsoil (Plate 10.5). There was no visible indication of any archaeological, architectural or cultural heritage material at ground level.

Plate 10.5: View of Area 5 looking west.

Area 6

This is the southeast corner of a large rectangular northwest sloping field of pasture enclosed by banks and ditches with mature trees (Plate 10.6). There are two historical disused quarry pits in the field identifiable on the OSI 25 Inch 1888-1913 mapping. There was no visible indication of any archaeological, architectural or cultural heritage material at ground level.

Plate 10.6: View of Area 6 looking southeast.

Area 7

This is a large rectangular northwest sloping field of pasture enclosed by banks and ditches with mature trees (Plate 10.7). There are eight historical disused quarry pits in the field identifiable on the OSI 25 Inch 1888-1913 mapping. The Deerpark wall forms the southeast boundary (Plate 10.8). The wall is partly ruined with mature trees growing on it in places. There was no visible indication of any other archaeological, architectural or cultural heritage material at ground level.

Plate 10.7: View of Area 7 looking southeast.

Plate 10.8: View of the Deerpark wall in Area 7 looking southeast

Area 8

This is a rectangular-shaped area of undulating west-sloping pasture, enclosed by banks with hedgerow and mature trees (Plate 10.9). There was no visible indication of any archaeological, architectural or cultural heritage material at ground level.

Plate 10.9: Panoramic view of Area 8 looking northwest

Area 9

This is a pentagonal-shaped area of undulating west-sloping pasture, enclosed by banks with hedgerow and mature trees (Plate 10.10). There was no visible indication of any archaeological, architectural or cultural heritage material at ground level.

Plate 10.10: Panoramic view of Area 9 looking northeast.

Area 10

This is a long concave-shaped area of undulating west-sloping pasture, enclosed by banks with hedgerow and mature trees (Plate 10.11). There was no visible indication of any archaeological, architectural or cultural heritage material at ground level.

Plate 10.11: View of Area 10 looking northwest.

10.6 POTENTIAL EFFECTS

Direct effects

SMR WI005-123---- a Deerpark wall is situated on the southern edge of the application area forming the boundary with Deerpark townland. There will be no other direct effects on any known items of archaeology, cultural heritage or buildings of heritage interest in the application area or the vicinity.

Indirect effects

There will be no indirect effects on any known items of archaeology, cultural heritage or buildings of heritage interest in the application area or the vicinity.

Interaction with other effects

No interaction with other effects have been identified.

Do nothing effects

If the proposed development were not to proceed there would be no negative effect on the cultural heritage.

Worst case effect

In the worst-case scenario soil-stripping of unstripped land within the application area in Areas 2 ,3, 4, 5, 6, 7, 8, 9 and 10 may have a significant, permanent, negative/adverse effect on previously unknown subsurface archaeological deposits or artefacts without preservation by record taking place.

Unplanned events

No unplanned events arising from the proposal capable of effecting known cultural heritage within the application area has been identified by the assessment.

10.7 MITIGATION MEASURES

Direct effects

Extraction should be set back 10 m from SMR WI005-123---- the Deerpark wall that is situated on the southern edge of the application area forming the boundary with Deerpark townland. As such, the design includes a set back for a safety/screening berm which will set back the extraction activities from the Deerpark wall.

Due to the possibility of the survival of previously unknown subsurface archaeological deposits or finds within the unstripped part of the application area in Areas 2 ,3, 4, 5, 6, 7, 8, 9 and 10 all soil-stripping in these areas should be archaeologically monitored under licence from the National Monuments Service.

Indirect Effects

No indirect effects warranting specific mitigation were identified during the course of the cultural heritage assessment.

10.8 RESIDUAL EFFECTS

No residual effects have been identified.

10.9 CUMULATIVE EFFECTS

The proposed development will not have any effect on the setting of any archaeological architectural or cultural heritage and therefore the application is not considered to have any cumulative effects on cultural heritage.

10.10 MONITORING

No monitoring except that required to ensure no archaeological heritage is disturbed during soil stripping will be required.

10.11 DIFFICULTIES ENCOUNTERED

No difficulties were encountered in the compilation of this assessment.

10.12 SUMMARY AND CONCLUSIONS

This environment assessment report is intended to assess the potential effect on the archaeological, architectural and cultural heritage of the application site and the surrounding area of a proposal to further development of an existing quarry over approximately 64.0 hectares (ha.) located in the townlands of Athgarrett, Philipstown and Redbog, Co. Kildare. There is no known the archaeological, architectural and cultural heritage in the application site and the proposal will have no impact on any known cultural heritage. Extraction should be set back 10m from SMR WI005-123---- the Deerpark wall to avoid any impact on the monument. Due to the possibility of the survival of previously unknown subsurface archaeological deposits or finds within the unstripped part of the application area in Areas 2 ,3, 4, 5, 6, 7, 8, 9 and 10 all soil-stripping in these areas should be archaeologically monitored under licence from the National Monuments Service.

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Appendix 10A

RECORD OF MONUMENTS AND PLACES (RMP) SITES IN THE STUDY AREA

KD020-013---- Enclosure WOLFESTOWN
Shown on the latest ed. (1913-17) of the OS 6-inch map as a raised circular area (est. diam. c. 40m) enclosed by an outer bank from NNW-ENE and from S-WNW (est. ext. diam. c. 70m NE-SW. In 1972, there was no visible trace of these features and the area was a flat-topped hill (SMR file). The site and surrounding ground, especially to the S, are visible as having been extensively quarried on a 2000 aerial photograph (OSI Orthophoto).

KD020-014---- Mound CAUREEN
Prominently sited c. 60m W of a hill summit with panoramic views in all directions except E. A low, circular, grass-covered, earthen mound (diam 17m; H 1.5m at E-2m at N) has a large central depression (av. diam. 3m) which may be the result of modern disturbance, or might be the remains of a collapsed central chamber. A small earthfast boulder (visible dims. L 0.6m; H 0.5m) at the mound's base at N may be a kerb stone, while a second similar stone, just W of the mound's base at W may be a displaced kerbstone. Low whin-cover is starting to establish on the mound SW-WNW.

KD025-001---- Ringfort – rath WOLFESTOWN
On a short, moderately steep-sided pasture ridge (WNW-ESE) with an extensive sand/gravel quarry c. 50m to the ENE. A circular area (diam. 30m) is defined by a generally low earthen bank (int. H 0.1-0.6m; Wth 0.8-1.9m; ext H 0.6-2.1m) S-NW-SE which is reduced to a low scarp (H 1m) elsewhere. The enclosing bank is best preserved SSW-W-NW where it is hedged and reused as a field boundary. There is no visible surface trace of a fosse. An arc of spoil and large stones (L 20m; Wth 5m) has been dumped against the enclosing bank at NE. The interior has been partially dug out, leaving an L-shaped depression (L 15m SW-NE; L 12.5m WNW-ESE; Wth 7m).

KD025-006---- Enclosure ATHGARRETT
On summit of a high step-sided hill (OD c. 270m), in mixed tillage and pasture. A circular area (diam. 58m) is defined by a low earthen bank (int. H 0.5-1m; ext H 0.7-1.2m) with external stone facing S-W-NE, and traces of a possible narrow, outer fosse (Wth 1m) S-W. No visible entrance. The tree-planted interior contains a centrally located, low circular mound of earth and stone (base diam. 10m; surface diam. 2m; H 0.6m), probably a trigonometrical station.

KD025-007---- Burial ATHGARRETT
In undulating pasture. Discovered in 1983 during topsoil-stripping for the construction of the Cork-Dublin natural gas pipeline. Most of a flat-based, bucket-shaped pot containing 'tiny fragments of burnt bone' was found standing upright in a pit of only very slightly larger volume and shape, which may originally have been sealed by a covering stone. While the paucity of the burnt bone led the excavator to caution against interpreting it as a cinerary urn, the form of the vessel suggests a Late Bronze Age date.

KD025-008---- Barrow - ring-barrow NEWTOWNPARK
Prominently located (OD c. 296m) at the NE end of a narrow-topped, moderately steep-sided NE-SW ridge, overlooking Glen Ding valley to the NE and with panoramic views in all directions except SW. A sub-circular area (diam. 14.4m E-W; 13.4m N-S) is defined by a shallow fosse (D 0.2-0.4m: base Wth 0.8m at N – 3.5m at E) and by a low, heavily poached outer earthen bank (int. H 0.2-0.6m; Wth 2.5m at S – 4.1m at W; ext. H 0.3-0.5m) which has a spine of dense stony material, and possible small

inner revetting stones at S (ext. diam. 29m E-W; 27.5m N-S). An entrance gap (Wth 3.3m) at ESE is flanked on its S side by a single revetting stone on the inner face of the bank.

KD025-010---- Hearth ATHGARRETT
A 'cist-like setting of stones with evidence for extensive in situ burning' (pers. comm. M. Cahill NMI).

KD025-014---- Enclosure NEWTOWNPARK
Situated in grassland with ring-barrow 155m to W. Circular-shaped enclosure (approx. diam. 20m) bisected by post-1700 field boundary visible on Digital Globe aerial photography.

WI005-001---- Cist DILLONSDOWN
Situated at the NE edge of a small sand ridge in undulating terrain. A bowl and unburnt bones found in 1934 in a 'passage' (presumably a cist) of small boulders possibly under a small cairn. The site is now within a substantial sand quarry.

WI005-011---- Enclosure DEERPARK
Listed as an 'enclosure' in the SMR (1986) based on aerial photographic evidence (GSI N 333/2 (1973)). In forestry, on undulating terrain overlooking a ravine on the Wicklow/Kildare border. Pond adjacent to E.

WI005-012---- Ringfort - unclassified DEERPARK
National Monument in state ownership No. 662. Situated on a small prominence at the S edge of a ridge with steep slopes immediately to the S, W and E. Ringwork (dims. 49m N-S; 36m E-W) defined by an earthen bank (Wth 2.5-4m; int. H 1-1.5m) with an external fosse (Wth 6m) and an outer bank (Wth 2m; H 0.5-1.5m) except at the W side. The enclosed platform is at a considerably higher level than the outer bank and fosse. The platform is probably natural and has a large depression at the east side. The entrance (Wth 1m) is at the S with a corresponding causeway across the fosse and gap in the outer bank. (GSIAP, N 332-3).

WI005-023---- Enclosure NEWPADDOCKS
Situated on a gentle SE-facing slope. Circular enclosure (diam. c. 25m), visible on aerial photographs (GSIAP, N 332-3). The site has been removed by sand quarrying.

Appendix 10B

SITES IN THE SITES AND MONUMENTS RECORD IN THE STUDY AREA

WI005-123---- Deer park DEERPARK
Indicated on the first edition OS 6-inch map. A detailed plan, elevation and photographic record of the north-western boundary of this Deerpark was undertaken in February 2000. This is a 285m length of mortared stone wall, revetting a low bank and internal ditch and defining part of the circuit of the 17th-century deer park.

Appendix 10C

FINDS FROM THE STUDY AREA IN THE NATIONAL MUSEUM OF IRELAND

Polished Stone Axe

This axe was reported found in a bog in Deerpark townland in 1935

NMI IA 243/64

Gold Lunula

Found in the Blessington area before 1909. Formerly in the Canon Greenwell collection and presented to the British Museum.

BM. WG 31, Price and Walshe 1933, 66, pl. VIII,

Stone Macehead, Largs type

Found in a sandpit in Blessington in 1884

NMI 1959:521, Simpson 1989, 125, No. 59.

Saddle Quern

Found in the Blessington area before 1990, along Kings river

NMI 1990:15

Appendix 10D

SUMMARIES OF EXCAVATIONS IN THE STUDY AREA

Wicklow

Newpaddocks and Santry Hill, Blessington

No archaeological significance

02E1581

Monitoring of subsurface groundworks before a development of 150 houses in the environs of Blessington village was requested because of the proximity of a number of Recorded Monuments, including a ringfort (SMR 5:23), a barrow (SMR 5:21) and a house site of late 17th-century date associated with Blessington Demesne (SMR 5:18). All subsurface works associated with the development were monitored, but no finds or features of archaeological significance were uncovered.

Deerpark

17th-century deer park

00E0078

Monitoring was undertaken at the site of the proposed extension to the Blessington Sand and Gravel Pit in Deerpark townland, in February, March and August 2000. Prior to monitoring, a detailed plan, elevation and photographic record of the north-western boundary of the area were undertaken in February 2000. This is a 285m length of mortared stone wall, revetting a low bank and internal ditch and defining part of the circuit of the 17th-century deer park. The wall, which also marks the Kildare/Wicklow county boundary, will not be affected by the expansion of the quarry.

Within the deer park enclosure a stand of commercial forestry of c. 1.6ha was clear-felled in March 2000. An irregular area of c. 6700m2, measuring a maximum of 70m east–west by 125m, was stripped of all remaining vegetation and topsoil in August 2000. This comprised 25% of the proposed area of extraction. All ground disturbance associated with clear-felling of commercial forestry, the removal of the stumps and roots of felled trees, the access of machinery and the stripping of topsoil was monitored. No artefacts, deposits or features of an archaeological nature were identified. The almost-complete absence of even modern finds is notable, suggesting that the incorporation of this area into a deer park in the later 17th century greatly restricted subsequent use of this part of the Glen Ding ridge.

Deerpark

Monitoring

00E0078 and 02E0538

A full survey and elevation of the north-eastern extent of the Deerpark boundary was undertaken by Arch-Tech Ltd. in February 2000, and presented in a report to Dúchas and Wicklow County Council

(dated 21st March 2000). Three successive phases of licensed archaeological monitoring of tree-felling, root removal and topsoil removal were undertaken by Arch-Tech Ltd. in March 2000, August to September 2001 and May to June 2002 (Excavation Licences 00E0078 and 02E0538). During the continuous monitoring of all ground disturbance over a total area of c. 2.5 ha, no archaeological features, deposits or artifacts were identified. During the course of this monitoring work, portions of two undated field boundaries were removed, and no evidence was noted to suggest that these were of early date.

11

LANDSCAPE AND VISUAL

PUBLIC

11 LANDSCAPE AND VISUAL

11.1 INTRODUCTION

This document has been prepared by Cunnane Stratton Reynolds Ltd (CSR), Landscape Architects and Planners.

This Landscape and Visual Impact Assessment (LVIA) was informed by a desktop study and a survey of the site and receiving environment in November 2023. This LVIA has been prepared to accompany an application for permission for further development of a quarry at Athgarrett, Philipstown and Redbog, Co. Kildare. The site of the proposed development is located along and just within the border of northeast County Kildare and lies ca.1.8 km northwest of Blessington in County Wicklow.

This Landscape and Visual Impact Assessment and accompanying Restoration Plan was carried out by Ronan Finnegan (BSc PG Fip LA CMLI). Ronan is a Chartered Landscape Architect (Charted Member of the Landscape Institute UK) with over 13 years' experience in LVIA in Ireland and the UK for a wide range of development types.

Oversight of the chapter was provided by Jamie Ball, MILI, Senior Landscape Planner of Cunnane Stratton Reynolds.

Macro Works Ltd., a Dublin-based landscape consultancy firm specialising in LVIA, generated Viewpoint maps, Zone of Theoretical Visibility Maps and 13 No. verified photomontages as part of this application.

11.1.1 STUDY AREA

According to Section 5.2 of the Guidelines for Landscape and Visual Impact Assessment (3rd Edition 2013):

"*The study area should include the site itself and the full extent of the wider landscape around it, which the proposed development may influence in a significant manner.*"

The study area extents for this LVIA derives from the nature of the existing site's quarrying activity and consideration of the proposed development.

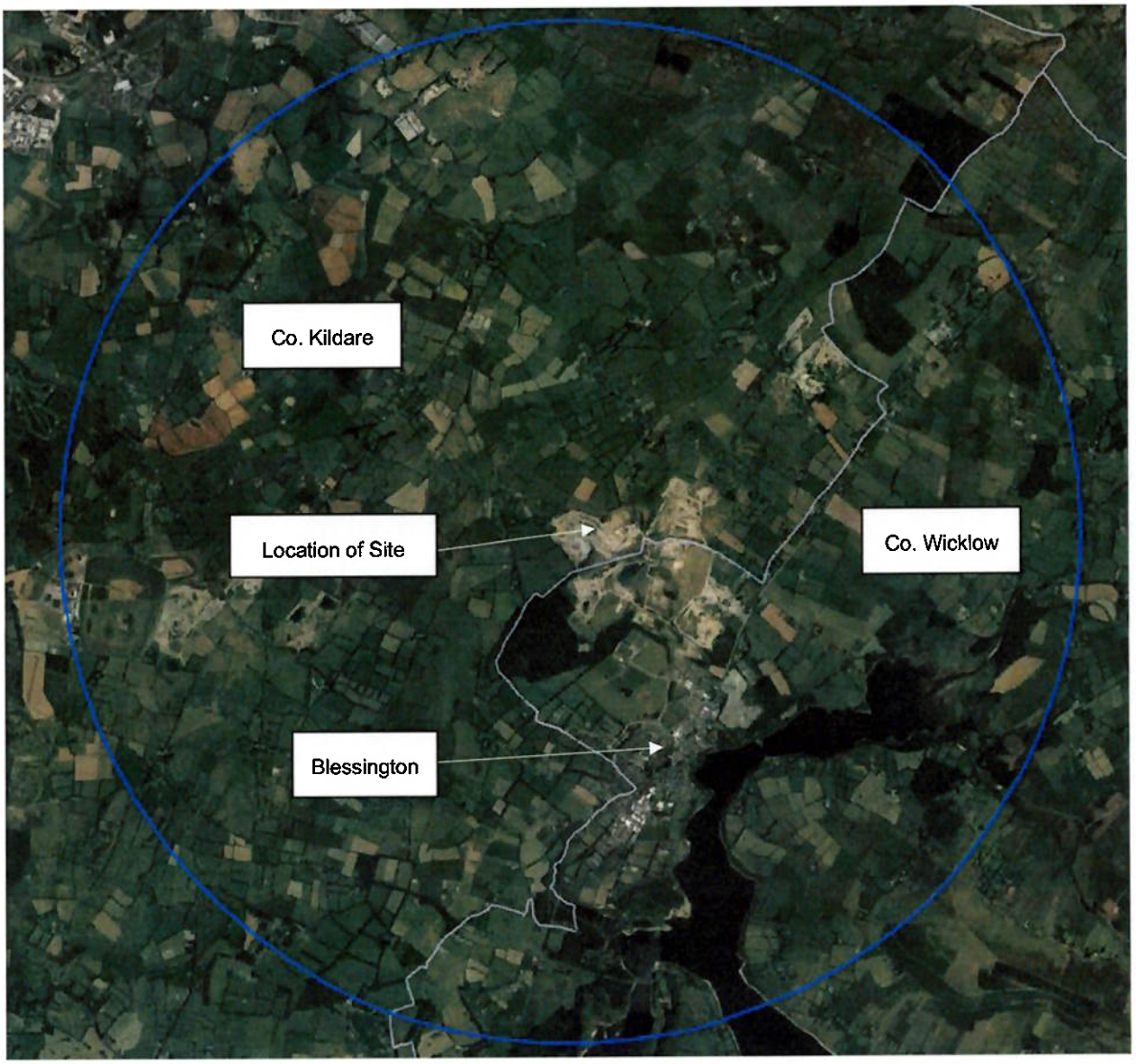


Figure 11-1 - 5 km Study Area Extents Map

While there is a low capacity for significant impacts to arise beyond 2km from the site, due to the nature and location of the proposed development, a 5km study area has been selected in this instance (Figure 11-1, above). However, an emphasis will be placed on receptors within 0-2km of the site, as these are more/most likely to have the capacity to experience significant visual effects. It should not be inferred that the proposed development is unlikely to be visible from any location beyond the study area, but, more importantly, that the subject development is unlikely to influence such receptors in a significant manner.

EIA Project Area

The EIA project area, defined in Figure 11-2 below, is referred to under the heading 'Site and Immediate Vicinity'. However, the LVIA study area also includes the wider landscape, as specified in Figure 11-1, above.

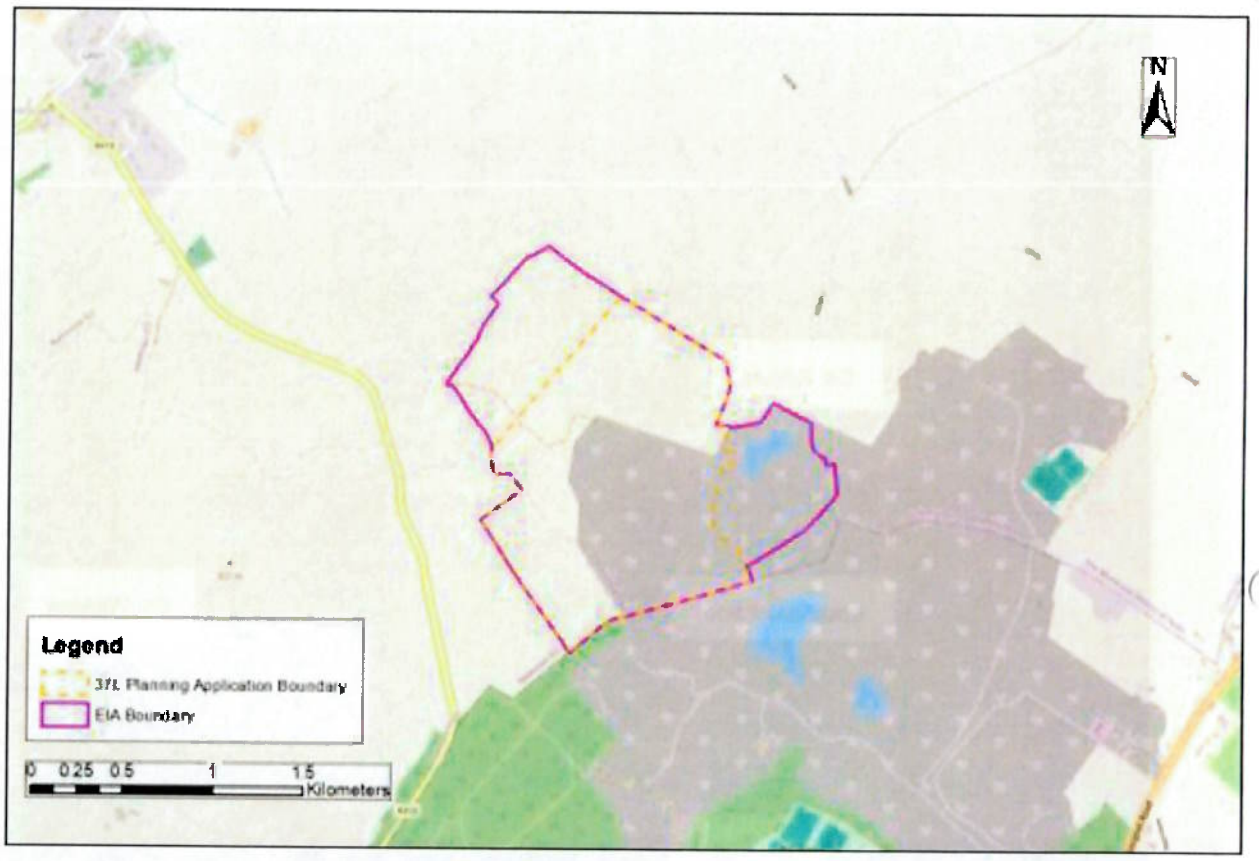


Figure 11-2 - Section 37L application area and the lands the subject of the EIAR.

11.1.2 GEOGRAPHICAL AND TEMPORAL SCOPE

This LVIA forms part of an Environmental Impact Assessment Report (EIAR) has been prepared to accompany an application for permission for further development of a quarry within the townlands of Athgarrett, Philipstown and Redbog, Co. Kildare. The EIAR has been prepared in tandem with an rEIAR to accompany an application for substitute consent for that existing quarry by the same applicant, Hudson Brothers Ltd, (HBL).

The further development of the quarry is proposed over areas directly adjacent to the main operational lands already excavated, as well as within the existing quarry for the purpose of recovering the economic reserve that remains in the void. The proposed development site (i.e. the application site), extending the excavation to the north and west, lies at the centre of an established landholding.

The centre of this landholding has been the subject of historic, current and intended future extraction. The southern boundary is delineated by the Wicklow and Kildare County boundaries and the western and northern boundaries of this area are delineated by the Philipstown townland boundary. The east of the area is within the Redbog townland and delineated by field/property boundaries. This area extends to approximately 95.8 ha. and constitutes the EIA project boundary for this quarry, (see Figure 11-2).

The lands subject to this EIAR are approximately 95.8 ha. and entirely encompass the application area of approximately 64.0 ha, (see Figure 11-2). The application area holds the main pit extraction area of the quarry and a proposed northern extension (approximately 21.2 ha in total, with an internal extraction area of approximately 17.7 ha) and a proposed western extension (approximately 10.2 ha in total, with an internal extraction area of approximately 9.4 ha)..

The reserve at this quarry is greywacke rock, overlain by sand and gravel, currently worked to a maximum depth of 188 mAOD. The rock reserve is traditionally excavated by blasting and mechanical means, primarily processed by mobile plant at the working face. Excavated sand, gravel and rock will be extracted to the west and north and transported internally to a centrally located existing administration and processing area over approximately 5 ha. that holds further processing plant (washing, screening, grading). This plant and processing area is an established part of the quarry area.

HBL are the owners and operators of a quarry and aggregate product land use site located across the counties of Kildare and Wicklow, since the 1950s, formally becoming a company in 1971.

The trans-county HBL operational facility summarily consists of: a pit, processing plant and offices at New Paddocks, Blessington, County Wicklow where the main entrance to their operation exists onto a local road that accesses the N81; and a quarry with processing plant and staff welfare facilities to the rear (north west) of their Wicklow lands over Philipstown and Redbog in Co. Kildare. The HBL operation in Kildare is adjacent to other quarry and associated land uses operated by unrelated parties.

11.2 LEGISLATIVE AND POLICY CONTEXT

11.2.1 LEGISLATION

The importance of the role of landscape and protection of its character through establishing planning policies and designations as part of the decision making at national, through to county council level, is governed by the Planning and Development Act 2000 (as amended).

The Planning and Development Act has applied the same meaning to landscape as in Article 1 of the European Landscape Convention (ELC) 2000, ratified by Ireland in 2004, which states Landscape as being an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors. The Irish Government has produced the National Landscape Strategy 2014-2025 to implement the ELC which aims to implement six core objectives through decision making including recognise landscape in law, national landscape character assessment, landscape policies, increased landscape awareness, education and public participation.

The general EIA legislation and guidance documents are listed in Chapter 1, (Introduction) of this EIAR.

11.2.2 RELEVANT POLICIES AND PLANS

This section sets out a review of landscape related planning policy of the county development plans of Kildare County Council (KCC) and neighbouring Wicklow County Council (WCC), as both local authorities fall within the extent of the study area. It includes:

- Adopted Kildare County Development Plan 2023-2029.
- Adopted Wicklow County Development Plan 2022-2028.

The local planning and other policies from the above development plans are reviewed, which identify key relevant development objectives and policies.

11.2.2.1 Adopted Kildare County Development Plan 2023-2029

The Kildare County Development Plan 2023-2029 (hereafter referred to as KCDP) was adopted on 28th January 2023.

Section 9.9 Mineral Resources & Extractive Industry

Section 9.9.1 'Post Closure of Extractive Industry After-Use Strategy for Quarries,' sets out the County Council's 'after use' strategy for quarries. Rehabilitating ecology and biodiversity and restoration plans will provide for a mosaic of habitats. Infilling and backfilling may be preferable than reverting to agricultural grassland for ecological and biodiversity purposes. It states:

'The conditions of quarry after-use and rehabilitation frequently involves the restoration of quarries, as far as possible, to their original appearance. This may result in the loss of key features that may ironically, have some ecological benefit or rich biodiversity interest…

'Therefore, in developing any after-use strategy and/or restoration plan, there will be a requirement to prepare a detailed survey and assessment of the intrinsic ecological character first (by an appropriate ecologist), identifying the range and location of key species of flora and fauna on site. The rehabilitation plan should work around these habitats and species in a process known as Rehabilitation Ecology. Ideally, the final restoration plan will provide for a mosaic of habitats, including, for example, cliff/sand or gravel banks, ponds, wetlands, open meadow (appropriately seeded), naturally recolonizing scrubland and planted woodland (i.e., saplings of native tree species) …'

RD O44 Require applications for mineral or other extraction to include (but not limited to):

'…A detailed landscaping plan to be submitted indicating proposed screening for the operational life of the site. The predominant use of native plant species in the proposed landscaping plan will be expected. Detailed landscaping and quarry restoration plans. Habitats and species surveying shall be carried out and shall influence the restoration plan for the site…'

Thus, a restoration plan has been included as part of this application and can be found in Appendix 11A.

Section 13.3 Landscape Character Assessment

A Landscape Character Assessment was carried out in 2004 which divided the county into distinct Landscape Character Areas (LCAs). The site lies within the 'Eastern Uplands' Landscape Character Area (LCA) which has been graded with a landscape sensitivity rating of 'Class 3 - High,' which is regarded as:

"Areas with reduced capacity to accommodate uses without significant adverse effects on the appearance or character of the landscape having regard to prevalent sensitivity factors."

Table 13.3 of the KCDP (Figure 11-3) sets out the likely compatibility between a range of land-uses and each of the county's principal LCAs. This table outlines the 'Eastern Uplands', within which the application site is located, as having its most compatible land uses being "agriculture, forestry and tourism projects." For all other land-uses, including extraction (i.e. sand & gravel), it has rated these as having a "medium" compatibility.

Table 13.4 (Figure 11-4) further sets out the "likely compatibility between a range of land-uses and proximity to Principal Landscape Sensitivity Factors." The compatibility matrix considers not only the confines of the Site and its location but its proximity within 300m of Principal Landscape Sensitivity Factors.

The application site consists of an active quarry and pasture, with the pastureland in the southwest being located close (i.e. within 300 m) to a ridgeline, as illustrated in Figure 11-5, below. The KCDP identifies a somewhat broad, conceptual parameter that should apply between certain landscape sensitivities and specific land uses. Thus, 'sand and gravel extraction,' is "very unlikely to be compatible" (i.e. '0' rating) if located within 300 m of a ridgeline; "compatible only in certain circumstances" (i.e. '2' rating) if located within 300 m of mixed forestry and is "likely to be compatible with great care" (i.e. '3' rating) if located within 300 m of "agricultural land with natural vegetation." However, such broad parameters that apply conceptually across the entire County of Kildare, may not be as applicable in more localised contexts, where more complex or nuanced landscape elements are in place.

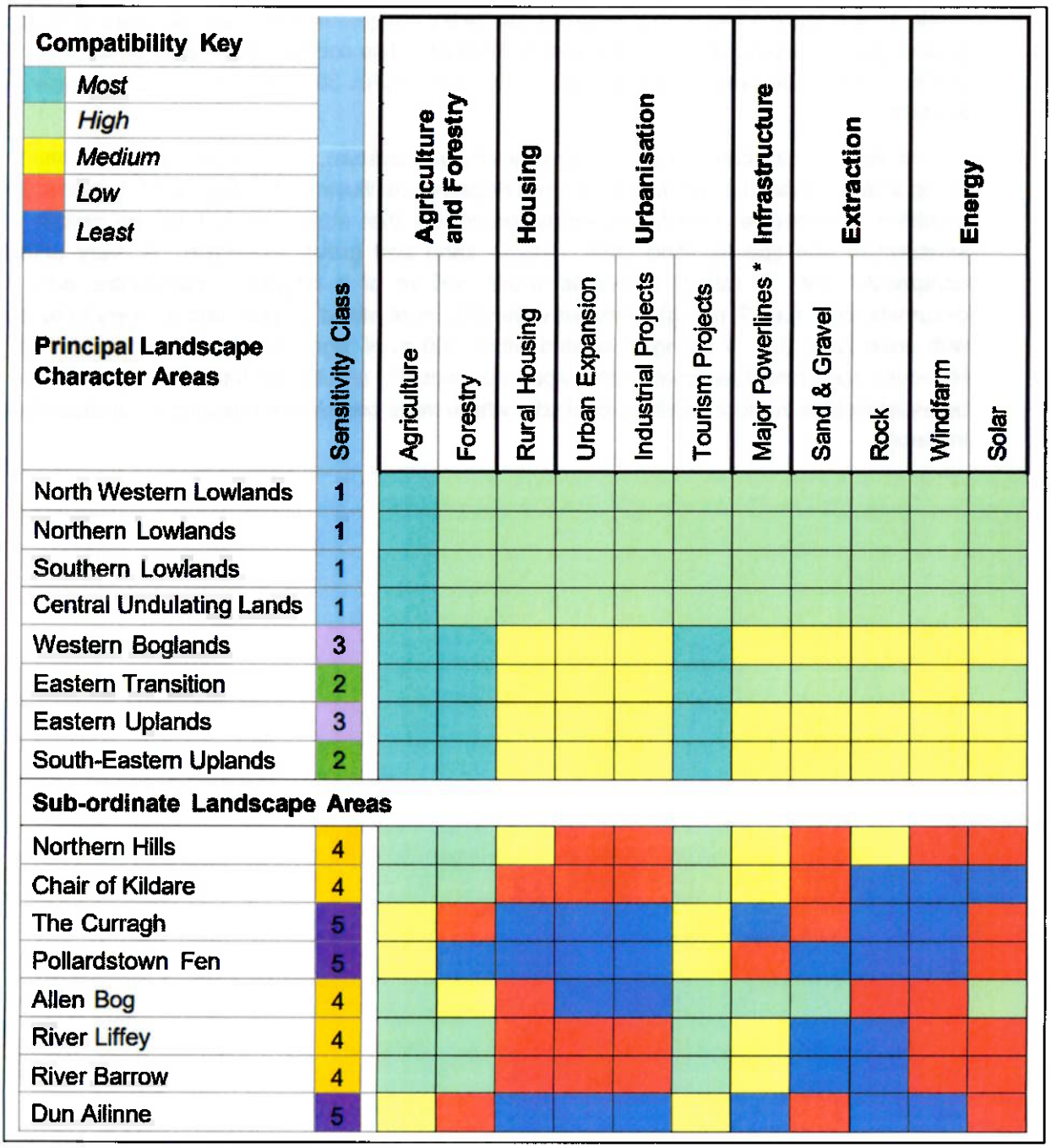


Figure 11-3: ***Table 13.3*** **from the KCDP –** ***'Likely compatibility between a range of land-uses and Principal Landscape Areas.'***

	Agriculture and Forestry		Housing	Urbanisation			infrastructure	Extraction		Energy	
5 - Likely to be very compatible in most circumstances. 4 - Likely to be compatible with reasonable care. 3 - Likely to be compatible with great care. 2 - Compatible only in certain circumstances. 1 - Compatible only in exceptional circumstances. 0 - Very unlikely to be compatible.											
Proximity within 300m of Principal Landscape Sensitivity Factors.	Agriculture	Forestry	Rural Housing	Urban Expansion	Industrial Projects	Tourism Projects	Major Powerlines	Sand and Gravel	Rock	Windfarm	Solar
Major Rivers and Water bodies	5	5	2	2	2	3	2	1	0	1	0
Canals	5	5	2	2	2	3	2	1	0	1	1
Ridgelines	5	5	1	1	1	1	1	0	0	2	0
Green Urban Areas	4	5	2	0	0	4	3	3	3	2	2
Broad-Leaved Forestry	3	5	2	2	2	4	3	2	3	1	2
Mixed Forestry	3	5	2	2	2	4	3	2	3	1	2
Natural Grasslands	5	2	2	1	1	4	2	1	1	2	2
Moors and Heathlands	2	2	1	0	0	1	2	1	0	2	1
Agricultural Land with Natural Vegetation	5	5	2	2	2	3	3	3	3	4	2
Peat Bogs	0	0	0	0	0	3	2	0	0	2	1
Scenic View	5	5	2	1	1	5	1	3	0	0	2
Scenic Route	5	5	2	1	1	5	1	3	0	0	2

Figure 11-4: ***Table 13.4 from the KCDP – 'Likely compatibility between a range of land-uses and proximity to Principal Landscape Sensitivity Factors.'***

Figure 11-5, below, which is taken from KCDP Landscape Sensitivity Map (V1-13.2), indicates that the Site is located within 300m of a 'ridgeline' and a 'Broadleaved forest' (i.e. Deerpark), as well as within 300m of Redbog pNHA and SPA.

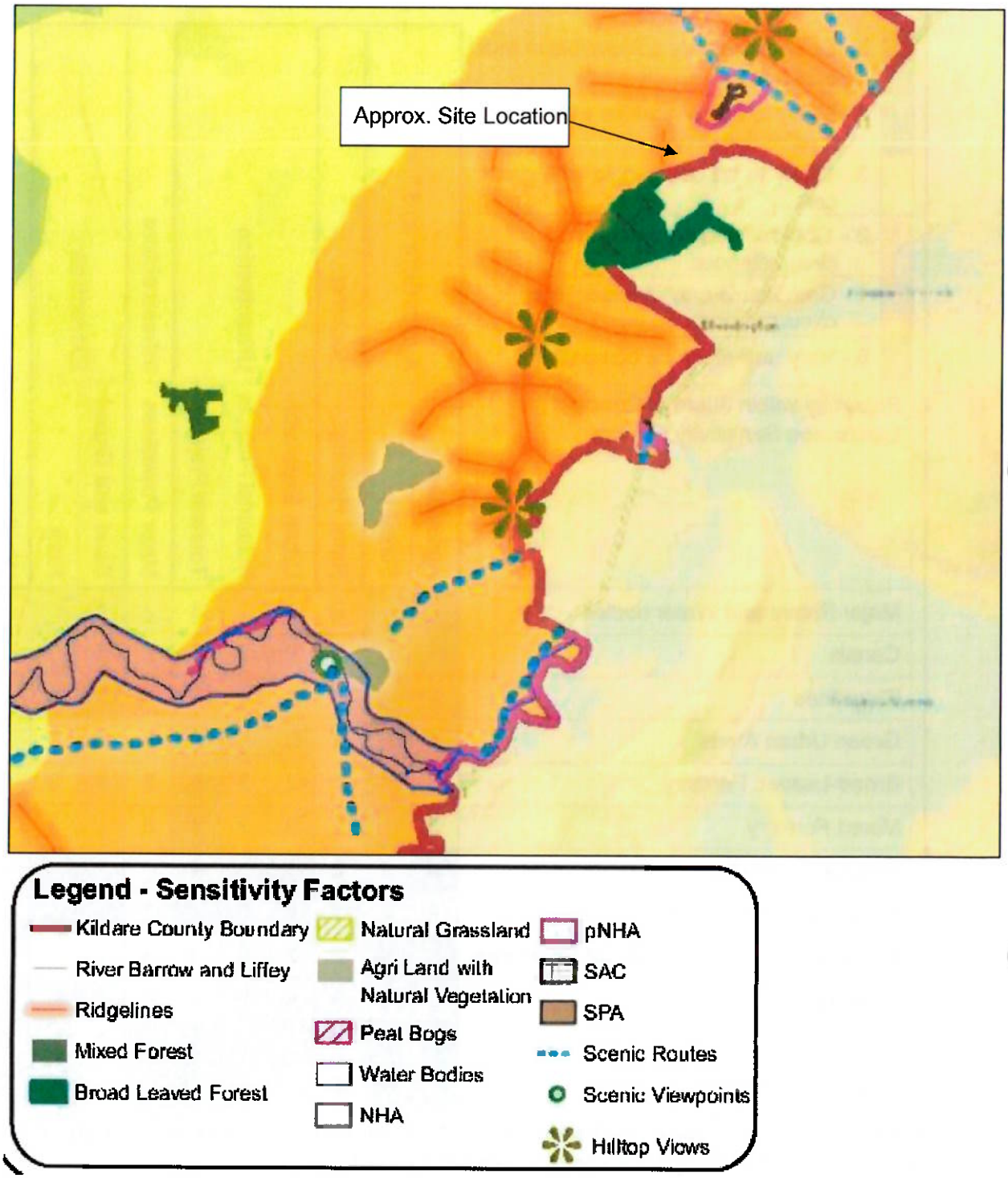


Figure 11-5: Extract of KCDP Landscape Sensitivity Map V1-13.2

In terms of policy for the protection and enhancement of the landscape policy LR P1 states:

'LR P1 Protect and enhance the county's landscape, by ensuring that development retains, protects and, where necessary, enhances the appearance and character of the existing local landscape.'

Objectives in relation to landscape impact of quarrying:

'LR O7 Restrict the quarrying of sensitive sites within the Landscape Character Areas in line with Table 13.3 and Table 13.4 above and to protect and conserve the ecological, archaeological, biodiversity and visual amenity surrounding quarry sites.'

'LR O8 Ensure that all quarrying activities and projects associated with the extractive industry comply with all relevant Planning and Environmental Legislation and the Guidelines for the Protection of Biodiversity within the Extractive Industry document 'Wildlife, Habitats & the Extractive Industry'.

Section 13.4 Areas of High Amenity

The Site is located within the East Kildare Uplands Area of High Amenity, which covers the same extent as the East Kildare Landscape Character Area. The KCDP describes the East Kildare Uplands Area of High Amenity (KCDP Section 13.4.12) as:

'The Eastern Uplands are located in the east of the county and are part of the Wicklow Mountain complex. The topography rises from the lowland plains, through undulating terrain to the highest point of 379m above sea level (O.D.) at Cupidstownhill, east of Kilteel. The elevated nature of this area provides a defined skyline with scenic views over the central plains of Kildare and the neighbouring Wicklow Mountains which further define the skyline and the extent of visibility. The East Kildare Uplands are rural in character with a number of scenic views from elevated vantage points. The general land use on the uplands is pasture, with some tillage, quarrying and forestry.

'Along a number of roads, which cross the upper and lower slopes of the uplands, there are long-distance views towards the Kildare lowlands and the Chair of Kildare. The sloping land provides this area with its distinctive character and intensifies the visual prominence and potential adverse impact of any feature over greater distances. Public roads traversing the slope provides an increased potential for development to penetrate primary and secondary ridgelines when viewed from lower areas and in a few areas the recent pattern of ribbon development obscures views across the plains of Kildare.

'In the Eastern Kildare Uplands, nearly all ridgelines are secondary when viewed from the lowland areas, as the Wicklow Mountains to the east define the skyline (i.e. form primary ridgelines). Gently undulating topography and shelter vegetation provided by conifer and woodland plantation can provide a shielding of built form. Views of the River Liffey Valley as well as of the Poulaphouca Reservoir are available from the hilltops and high points on some of the local roads.'

Relevant policy for the protection of high amenity areas includes:

LR P2 Protect High Amenity areas from inappropriate development and reinforce their character, distinctiveness and sense of place.

Section 13.4 Scenic Routes and Protected Views

The KCDP has designated a number of scenic routes, hilltop views and scenic viewpoints across the county which are highly valued. These are listed in the KCDP's Tables 13.5, 13.6 and 13.7 and the locations are mapped on Map V1 - 13.3 of the KCDP. The current KCDP has expanded on the previous KCDP views by labelling the hilltop views, as well as relabelling the previous scenic route no. 22 (from the 2017-2023 KCDP) to become scenic route Nos. 20 and 30, in the current KDCP. However, Scenic Route no. 12 remains the same in both the previous and current KDCPs.

The scenic routes and views considered relevant to the site due to their proximity or potential for some degree of visibility include (see Figure 11-6):

- *Scenic Route 12 - Views west of the Kildare Plains from the Redbog Area and views towards Caureen from Rathmore crossroads to Pipershall along the L6038 road.*
- *Hilltop View 08 – Caurcen Hill*

Section 13.5.1 'Views to and from Hills' states:

"As the landform of the county is generally flat, with very little variation in topography and predominantly low vegetation, extensive views can be obtained from hilltops, allowing vistas over long distances, and similarly from the lowland areas the eye is drawn to the primary and secondary ridgelines that define the skyline throughout the county. Ridgelines are conspicuous features of the natural landscape as they perform an important role as dominant landscape focal points. It is important that development does not interrupt the integrity of ridgelines. Development on steeply sloping land can be viewed over greater distances."

However, it is worth noting that the overwhelming majority of such Hilltop Views listed within the KCDP, are from within private and/or agricultural land, with no public accessibility. Therefore these views tend to solely represent landowners, or their employees, actively working the land. This is also the case for the aforementioned Hilltop View 08 – **Caurcen Hill', which is located more than 1.5km northeast of this** application site, whose major land use is intensive pastoral production. In addition, the primary views from Caurcen Hill are to the east/southeast, across the picturesque Blessington Lakes and towards the Wicklow Mountains, whereas the site is located more than 1.5km to the southwest of Caurcen Hill.

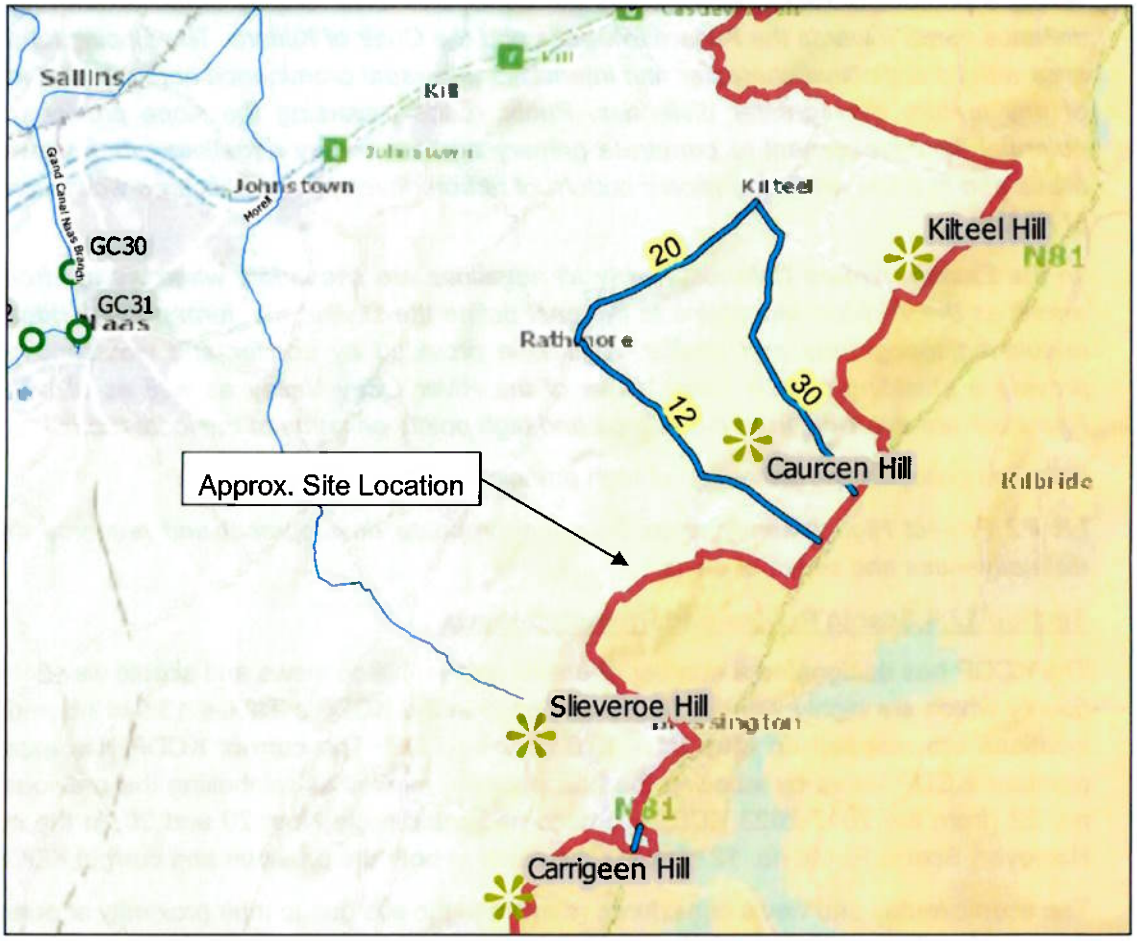


Figure 11-6: Extract of KCDP Scenic Route and Viewpoints Map V1 - 13.3

Section 12.6 - Designated Sites

The EU Birds Directive (Council Directive 79/409/ EEC) and the EU Habitats Directive (European Directive 92/43/EEC) provides for the establishment of the Natura 2000 network of sites of highest biodiversity importance for rare and threatened habitats and species across the EU. The Natura 2000 network of European sites comprises Special Areas of Conservation (SAC), and Special Protection Areas (SPA).

Under the Wildlife (Amendment) Act 2000, Natural Heritage Areas (NHAs) are designated to conserve species and habitats of national importance and sites of geological interest.

There are no Designated Sites within the Site. The Designated Sites within Kildare County Boundary that are closest to the Site are:

- Red Bog 000397 SAC
- Red Bog 000397 pNHA

These Designated Sites are located to the immediate northeast and east of the Site.

Relevant policy includes:

'BI P1 Integrate in the development management process the protection and enhancement of biodiversity and landscape features by applying the mitigation hierarchy to potential adverse impacts on important ecological features (whether designated or not), i.e. avoiding impacts where possible, minimising adverse impacts, and if significant effects are unavoidable by including mitigation and/or compensation measures, as appropriate. Opportunities for biodiversity net gain are encouraged.

BI P2 Seek to contribute to maintaining or restoring the conservation status of all sites designated for nature conservation or proposed for designation in accordance with European and national legislation and agreements. These include Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Natural Heritage Areas (NHAs), Ramsar Sites and Statutory Nature Reserves.

BI P3 Ensure that any proposal for development within or adjacent to a Natural Heritage Area (NHA), Ramsar Sites and Nature Reserves is designed and sited to minimise its impact on the biodiversity, ecological, geological and landscape value of the site, particularly plant and animal species listed under the Wildlife Acts and the Habitats and Birds Directive including their habitats.

BI P4 Ensure that any new development proposal does not have a significant adverse impact, incapable of satisfactory mitigation on plant, animal or bird species which are protected by law.'

Section 12.7 - Protected Habitats and species

'BI P4 Ensure that any new development proposal does not have a significant adverse impact, incapable of satisfactory mitigation on plant, animal or bird species which are protected by law.'

Section 12.9 - Trees, Woodlands and Hedgerows

'BI P6 Recognise the important contribution trees and hedgerows make to the county biodiversity resource climate mitigation, resilience and adaptation.

'BI P8 Ensure that Kildare's wetlands and watercourses are retained for their biodiversity, climate change mitigation properties and flood protection values and at a minimum to achieve and maintain at least good ecological status for all wetlands and watercourses in the county by, at the latest, 2027 in line with the Water Framework Directive and Ramsar Convention.'

Extractive Industries:

Chapter 9 of this KCDP outlines the council policies and objectives for the extraction industry and its restoration with regards to landscape include:

Relevant policy governing quarries and the extractive industries includes the following:

RD P8: Support and manage the appropriate future development of Kildare's natural aggregate resources in appropriate locations to ensure adequate supplies are available to meet the future needs of the county and the region in line with the principles of sustainable development and environmental management and tor require operators to appropriately manage extraction sites when extraction has ceased.

Relevant objectives covering quarries and the extractive industries include the following:

RD 042: Ensure that development for aggregate extraction, processing and associated concrete production does not significantly impact the following:

- Special Areas of Conservation (SACs)

- Special Protection Areas (SPAs)

- Natural Heritage Areas (NHAs)

- Other areas of importance for the conservation of flora and fauna.

- Zones of Archaeological Potential.

- The vicinity of a recorded monument.

- Sensitive landscape areas as identified in Chapter 13 of this Plan.

- Scenic views and prospects.

- Protected Structures.

- Established rights of way and walking routes.

- Potential World Heritage Sites in Kildare on the UNESCO Tentative List, Ireland.

RD O44:

A detailed landscaping plan to be submitted indicating proposed screening for the operational life of the site. The predominant use of native plant species in the proposed landscaping plan will be expected.

Detailed landscaping and quarry restoration plans. Habitats and species surveying shall be carried out and shall influence the restoration plan for the site.

Comprehensive Site Restoration Plan and/or After-Use Strategy should have regard to the principles of 'Rehabilitation Ecology' as follows:

RD O50:

Ensure the satisfactory and sensitive re-instatement and/or re-use of disused quarries and extraction facilities, where active extraction use has ceased. Future uses should include amenity, recreation and biodiversity areas shall be informed by an assessment of the specific site/lands and shall be subject to an ecological impact assessment or other environmental assessments as appropriate. Where it is proposed to reclaim, regenerate, or rehabilitate old quarries by filling or re-grading with inert soil or

similar material, or to use worked-out quarries as disposal locations for inert materials, the acceptability of the proposal shall be evaluated against the criteria set out in Section 15.9.6 of this Plan. The Council will resist development that would significantly or unnecessarily alter the natural landscape and topography, including land infilling/ reclamation projects or projects involving significant landscape remodelling, unless it can be demonstrated that the development would enhance the landscape and / or not give rise to adverse impacts.

RD O51: Require that quarry remediation plans provide for environmental benefit, biodiversity and re-wilding in all instances. The 80% requirement for environmental/biodiversity may be waived at sites closer to urban areas where a significant portion of the site is being provided for sports, recreation, and amenity.

11.2.2.2 Adopted Wicklow County Development Plan 2022-2028

The adopted Wicklow CDP has been considered within this section in relation to any protected views or scenic routes that may be of relevance to the site and/or development. Out of the 48 designated "Views of Special Amenity value or Special Interest" listed in Chapter 17 of the CDP, only two of these fall within the study area (i.e. View 33 and View 34). However, neither of these are orientated in the general direction of the Site, and therefore can be discounted from further consideration.

In addition to the above designated views, there are 66 designated "Prospects of Special Amenity value or Special Interest" listed in Chapter 17 of the Wicklow CDP, which take the form of routes along some of the county roads. Of these routes, only Prospect 20 and Prospect 21 (Figure 11-6 below) fall within the study area. However, the eastern oriented views are facing away from the Site, and therefore require no further assessment. Potential for views from Prospect 20: "R758, L8369, L4364 & L4365, Lake Drive from the N81 at Glashina to Oldcourt." is noted as "Prospect of Poulaphouca" as it runs on the eastern side of the lake. However, the Site is located more than 2 km from the Poulaphouca Reservoir and therefore does not merit further assessment

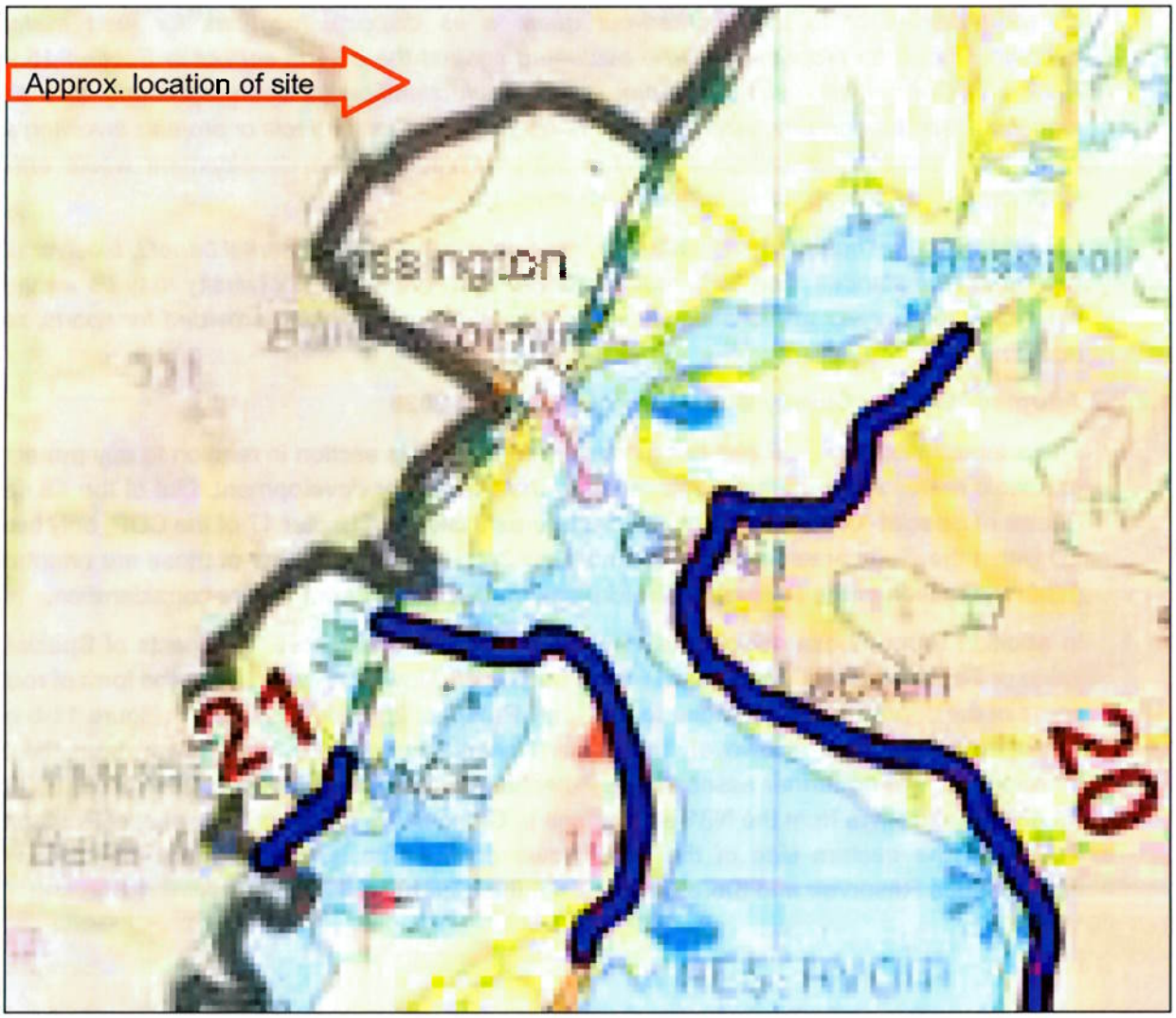


Figure 11-7: Extract of WCDP 2022-2028 Map 17.11 of those prospects within the study area -

Policy:

CPO 17.38: *To protect listed views and prospects from development that would either obstruct the view / prospect from the identified vantage point or form an obtrusive or incongruous feature in that view / prospect. Due regard will be paid in assessing development applications to the span and scope of the view / prospect and the location of the development within that view / prospect.*

The nearest county landscape designations within the study area are two Areas of Outstanding Natural Beauty (AONB), which include the Mountain Uplands AONB and Poulaphouca Reservoir AONB. Both of these are more than 2 km from the Site, with potential visibility from both considered within the Visual Impact Assessment of this report.

11.2.3 RELEVANT GUIDANCE

The Guidelines for Landscape and Visual Impact Assessment 2013 (abbreviated to GLVIA 2013) notes that as a cultural resource, the landscape functions as the setting for our day-to-day lives, also providing opportunities for recreational and aesthetic enjoyment and inspiration. It contributes to the sense of place experienced by individuals and communities and provides a link to the past as a record

of historic socio-economic and environmental conditions. As an environmental resource, the landscape provides habitat for fauna and flora. It receives, stores, conveys, and cleans water, and vegetation in the landscape stores carbon and produces oxygen. As an economic resource, the landscape provides the raw materials and space for the production of food, materials (e.g. timber, aggregates) and energy (e.g. carbon-based fuels, wind, solar), living space and for recreation and tourism activities.

The GLVIA (2013) notes that landscape is not unchanging. Many different pressures have progressively altered familiar landscapes over time and will continue to do so in the future, creating new landscapes. For example, within the receiving environment, the environs of the proposed development have altered over the last thousand years, from wilderness to agriculture and settlement or townscape.

Many of the drivers for change arise from the requirement for development to meet the needs of a growing population and economy. The concept of sustainable development recognises that change must and will occur to meet the needs of the present, but that it should not compromise the ability of future generations to meet their needs. This involves finding an appropriate balance between economic, social and environmental forces and values.

The reversibility of change is also described as an important consideration. If change must occur to meet a current need, can it be reversed to return the resource (in this case, the landscape) to its previous state to allow for development or management for future needs.

Climate change is one of the major factors likely to bring about future change in the landscape, and it is accepted to be the most serious long-term threat to the natural environment, as well as economic activity (particularly primary production) and society. The need for climate change mitigation and adaptation, which includes the management of water and more extreme weather and rainfall patterns, is part of this.

11.2.3.1 Key Guidance Documents

LVIA is a tool used to identify and assess the significance of and the effects of change resulting from a proposed development on both the landscape as an environmental resource in its own right and on people's views and visual amenity.

The methodology for assessment of the landscape and visual effects is informed by the following key guidance documents, namely:

- *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition Landscape Institute and the Institute of Environmental Management and Assessment (2013) (hereafter referred to as the GLVIA 2013).
- *Guidelines on the Information to be Contained in Environmental Impact Statements*. (EPA, 2022)

This guidance is authored by the Landscape Institute in the UK and the IEMA, which contains a network of members in UK and Ireland and internationally. The guidance was prepared within the parameters of relevant EU directives at the time and is updated, where necessary, by Landscape Institute bulletins online. The GLIVA 2013 is used internationally and is the industry standard for LVIA in Ireland.

The EPA guidance (2022) refers to the use of topic specific guidance and specifically references the GLVIA 2013 in relation to professional judgement. It recognises (at para 3.72) that:

"Some uncertainty is unavoidable in EIA, especially about matters that involve an element of judgement, such as assigning a level of significance to an effect. Such judgements should be explicit and substantiated rather than presented as objective fact. This is best done using agreed referable approaches, e.g. the Guidelines on Landscape and Visual Impacts Assessment provide guidance on what constitutes a severe visual effect".

References are also made to the *'Landscape and Landscape Assessment – Consultation Draft of Guidelines for Planning Authorities'* document, published in 2000 by the Department of Environment, Heritage and Local Government.

11.3 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

The GLVIA 2013 outlines the assessment process, which combines judgements on the sensitivity of the resource, and the magnitude of the change as a result of the proposed development. These are then combined to reach an assessment of the significance of the effect.

Another key distinction to make is that in the GLVIA methodology, a distinction is made between landscape effects and the visual effects of a proposed development.

'Landscape' results from the interplay between the physical, natural and cultural components of our surroundings. Different combinations of these elements and their spatial distribution create distinctive character of landscape in different places. 'Landscape character assessment' is the method used in LVIA to describe landscape, and by which to understand the potential effects of a development on the landscape as 'a resource'. Character is not just about the physical elements and features that make up a landscape, but also embraces the aesthetic, perceptual and experiential aspects of landscape that make a place distinctive.

Views and 'visual amenity' refer to the interrelationship between people and the landscape. The GLVIA 2013 prescribes that effects on views and visual amenity should be assessed separately from landscape, although the two topics are inherently linked. Visual assessment is concerned with changes that arise in the composition of available views, the response of people to these changes and the overall effects on the area's visual amenity.

11.3.1 ESTABLISHMENT OF THE BASELINE

The process set out in the GLVIA 2013 and in the EPA (2022) involves the preparation of the baseline or receiving environment characteristics. This includes two stages, which are a desk-based study and site visit/field study. These allow the assessor to establish the existing receiving environment and key landscape and visual characteristics and their sensitivities.

<u>The desk-based study includes:</u>

- Review of preliminary proposals and identification of preliminary study area
- Review of the history of the site including past activity and planning applications
- Review of the current and recent expired Development Plan(s) within the study area, and any other plans as appropriate, to identify relevant national and local designations and polices.
- This may include designations such as scenic routes, protected views and other landscape designations including any Landscape Character Assessments International designations such as UNESCO designations would also be relevant here, if present.
- Other information that may be consulted include aerial imagery, OSI Discovery series mapping, historic (6-inch and 25 inch) mapping and CORINE Landcover Maps (2018).

A site visit was then carried out to review and/or confirm the findings of the desk-based study and provide a more detailed description of the landscape and visual character of the study area. Based on both the desk study and site visit, the assessor identifies landscape and visual receptors and their relative sensitivity. The site visit was carried out in November 2023.

11.3.2 ASSESSMENT OF EFFECTS:

Once the baseline is established, and the proposed development drawings and descriptions reviewed, the assessment process is commenced, the methodology for which is outlined in Section 11.3.3 - 11.3.4.

Use of 'Impact and 'Effect

Section 1.16 of the GLVIA (referring to the EIA Directive), advises that the terms 'impact' and 'effect' should be clearly distinguished and consistently used in the preparation of an LVIA.

'Impact' is defined as the action being taken. In the case of the proposed development, the impact would include the extraction of aggregates and the associated activities related to the onsite processing of this extracted material.

'Effect' is defined as the change or changes resulting from those actions, e.g. a change in landscape character, or changes to the composition, character and quality of views in the receiving environment. This report focusses on these effects.

11.3.3 METHODOLOGY FOR LANDSCAPE ASSESSMENT

When assessing the landscape, the nature and scale of changes to the landscape elements and characteristics are identified, and the consequential effect on landscape character and value are discussed. Trends of change in the landscape are taken into account. The assessment of the significance of the effects takes account of the sensitivity of the landscape resource and the magnitude of change to the landscape, which resulted from the proposed development.

Definitions and descriptions of sensitivity, magnitude of change and quality and longevity of effects are derived from the GLVIA 2013. The GLVIA 2013 does not set out specific definitions of descriptions used but contains widely used principles and case studies / examples that are intended to inform a professional's methodology, supported by their experience and judgements in relation to landscape and landscape change. These descriptions expand and complement the EPA guidelines as intended, in relation to topic-specific guidance.

Sensitivity of the Landscape Resource

Sensitivity is a combination of Landscape Value and Landscape Sensitivity:

- Landscape values can be identified by the presence of landscape designations or policies, which indicate particular values, either on a national or local level. In addition, a number of criteria are used to assess the value of a landscape.

- Landscape susceptibility is defined in the GLVIA as, "*the ability of the landscape receptor to accommodate the proposed development without undue consequences for the maintenance of the baseline scenario and/or the achievement of landscape planning policies and strategies.*" Susceptibility is a function of its land use, landscape patterns and scale, visual enclosure and distribution of visual receptors, scope for mitigation, and the value placed on the landscape.

Susceptibility also relates to the type of development – a landscape may be highly susceptible to certain types of development but have a low susceptibility to other types of development.

It includes consideration of landscape values as well as the susceptibility of the landscape to change.

With regard to landscape effects, a proposed development has the potential to improve the environment as well as damage it. In certain situations, there might be policy encouraging a type of change in the landscape, and a particular development may achieve this. Landscape Sensitivity ranges from Low to Very High as outlined in Table 11-1.

Table 11-1 – Categories of Landscape Sensitivity

Sensitivity	Description
Very High	Areas where the landscape exhibits a very strong, positive character with valued elements, features and characteristics that combine to give an experience of unity, richness and harmony. The character of the landscape is such that its capacity for accommodating change in the form of development is very low. These attributes are recognised in landscape policy or designations as being of national or international value and the principal management objective for the area is protection of the existing character from change
High	Areas where the landscape exhibits strong, positive character with valued elements, features and characteristics. The character of the landscape is such that it has limited/low capacity for accommodating change in the form of development. These attributes are recognised in landscape policy or designations as being of national, regional or county value and the principal management objective for the area is conservation of the existing character.
Medium	Areas where the landscape has certain valued elements, features or characteristics but where the character is mixed or not particularly strong. The character of the landscape is such that there is some capacity for change in the form of development. These areas may be recognised in landscape policy at local or county level and the principal management objective may be to consolidate landscape character or facilitate appropriate, necessary change
Low	Areas where the landscape has few valued elements, features or characteristics and the character is weak. The character of the landscape is such that it has capacity for change; where development would make no significant change or would make a positive change. Such landscapes are generally unrecognised in policy and where the principal management objective is to facilitate change through development, repair, restoration or enhancement.
Negligible	Areas where the landscape exhibits negative character, with no valued elements, features or characteristics. The character of the landscape is such that its capacity for accommodating change is high; where development would make no significant change or would make a positive change. Such landscapes include derelict industrial lands or extraction sites, as well as sites or areas that are designated for a particular type of development. The principal management objective for the area is to facilitate change in the landscape through development, repair or restoration.

Magnitude of Landscape Change

The magnitude of change is a factor of the scale, extent and degree of change imposed on the landscape with reference to its key elements, features and characteristics (also known as 'landscape receptors'). Five categories are used to classify magnitude of landscape change.

For the purpose of assessment, five categories are used to classify the landscape sensitivity of the receiving environment, from Very High sensitivity to Negligible. These categories are defined in Table 11-2, below.

Table 11-2 – Magnitude of Landscape Change

Sensitivity	Description
Very High	Change that is large in extent, resulting in the loss of or major alteration to key elements, features or characteristics of the landscape and/or introduction of large elements considered totally uncharacteristic in the context. Such development results in fundamental change in the character of the landscape.
High	Change that is moderate to large in extent, resulting in alteration or compromise to key elements, features or characteristics, and/or introduction of large elements considered uncharacteristic in the context. Such development results in a moderate to large change to the character of the landscape.
Medium	Change that is moderate in extent, resulting in partial loss or alteration to key elements, features or characteristics of the landscape, and/or introduction of elements that may be prominent but not necessarily uncharacteristic in the context. Such development results in moderate change to the character of the landscape.
Low	Change that is limited in extent, resulting in minor alteration to key elements, features or characteristics of the landscape, and/or introduction of elements that are not uncharacteristic in the context. Such development results in minor change to the character of the landscape
Negligible	Change that is very limited in extent, resulting in no alteration to key elements, features or characteristics of the landscape, and/or introduction of elements that are characteristic in the context. Such development results in minimal change to the character of the landscape.

11.3.4 METHODOLOGY FOR VISUAL ASSESSMENT

In Section 11.6.2 *Visual Effects* of this report, the visual effects of the proposed development are assessed. Visual assessment considers the sensitivity of the viewers (i.e., groups of people) and the magnitude of the changes to the composition and character of views. The assessment is made for a number of viewpoints selected to represent the range of visual receptors in the receiving environment. The significance of the visual effects experienced at these locations is assessed by measuring the visual receptor sensitivity against the magnitude of change to the view resulting from the development.

Sensitivity of the Visual Receptor

Visual receptor sensitivity is a function of two main considerations:

- Susceptibility of the visual receptor to change. This depends on the occupation or activity of the people experiencing the view, and the extent to which their attention or interest is focussed on the views or visual amenity they experience at that location.

Visual receptors most susceptible to change include residents at home, people engaged in outdoor recreation focused on the landscape (e.g. Trail users), and visitors to heritage or other attractions and places of community congregation where the setting contributes to the experience.

Visual receptors less susceptible to change include travellers on road, rail and other transport routes (unless on recognised scenic routes which would be more susceptible), people engaged in outdoor recreation or sports where the surrounding landscape does not influence the experience, and people in their place of work or shopping where the setting does not influence their experience.

- Value attached to the view. This depends to a large extent on the subjective opinion of the visual receptor but also on factors such as policy and designations (e.g. scenic routes, protected views), or the view or setting being associated with a heritage asset, visitor attraction or having some other cultural status (e.g. by appearing in arts).

For the purpose of assessment, five categories are used to classify visual receptor sensitivity. These categories range from Very High to Negligible and are described in Table 11-3.

Table 11-3 – Categories of Visual Receptor Sensitivity

Sensitivity	Description
Very High	Viewers at iconic viewpoints - towards or from a landscape feature or area - that are recognised in policy or otherwise regarded as being of very high value or national value. This may also include residential viewers whose primary view is of very high value.
High	Viewers at viewpoints that are recognised in policy or otherwise designated as being of high value, or viewpoints that are highly valued by people that experience them regularly (such as views from houses or outdoor recreation features) and are valued by the local community. This would include tourist attractions, and heritage features of regional or county value, and viewers travelling on scenic routes.
Medium	Viewers at viewpoints representing people travelling at slow or moderate speed through or past the affected landscape in cars or on public transport, where they are partly but not entirely focused on the landscape, or where the landscape has some valued views. The views are generally not designated, but which include panoramic views or views judged to be of some scenic quality, which demonstrate some sense of naturalness, tranquillity, or some rare element in the view.
Low	Viewers at viewpoints reflecting people involved in activities not focused on the landscape e.g. people at their place of work or engaged in similar activities such as shopping, etc. The view may present an attractive backdrop to these activities but there is no evidence that the view is valued, or that it is regarded as an important element of these activities.

	Viewers travelling at high speeds (e.g. motorways) may also be considered of low susceptibility.
Negligible	Viewpoints reflecting people involved in activities not focused on the landscape e.g. people at their place of work or engaged in similar activities, such as shopping, where the view has no relevance or is of poor quality and not valued.

Magnitude of Change to the view

Classification of the magnitude of change takes into account the size or scale of the intrusion of the proposed development into the view, relative to the other elements and features in the composition (i.e. its relative visual dominance), the degree to which it contrasts or integrates with the other elements and the general character of the view, and the way in which the change will be experienced (e.g. in full view, partial or peripheral, or glimpses). It also takes into account the geographical extent of the change, the duration and the reversibility of the visual effects.

Five categories are used to classify magnitude of change to a view. These range from Very High to Negligible and are defined in Table 11-4.

Table 11-4 – Magnitude of Visual Change

Sensitivity	Description
Very High	Full or extensive intrusion of the development in the view, or partial intrusion that obstructs highly valued features or characteristics, or the introduction of elements that are completely out of character in the context, to the extent that the development becomes dominant in the composition and defines the character of the view and the visual amenity.
High	Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features, or introduction of elements that may be considered uncharacteristic in the context, to the extent that the development becomes co-dominant with other elements in the composition and affects the character of the view and the visual amenity.
Medium	Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context, resulting in change to the composition but not necessarily the character of the view or the visual amenity.
Low	Minor intrusion of the development into the view, or introduction of elements that are not uncharacteristic in the context, resulting in minor alteration to the composition and character of the view but no change to visual amenity.
Negligible	Barely discernible intrusion of the development into the view, or introduction of elements that are characteristic in the context, resulting in slight change to the composition of the view and no change in visual amenity.

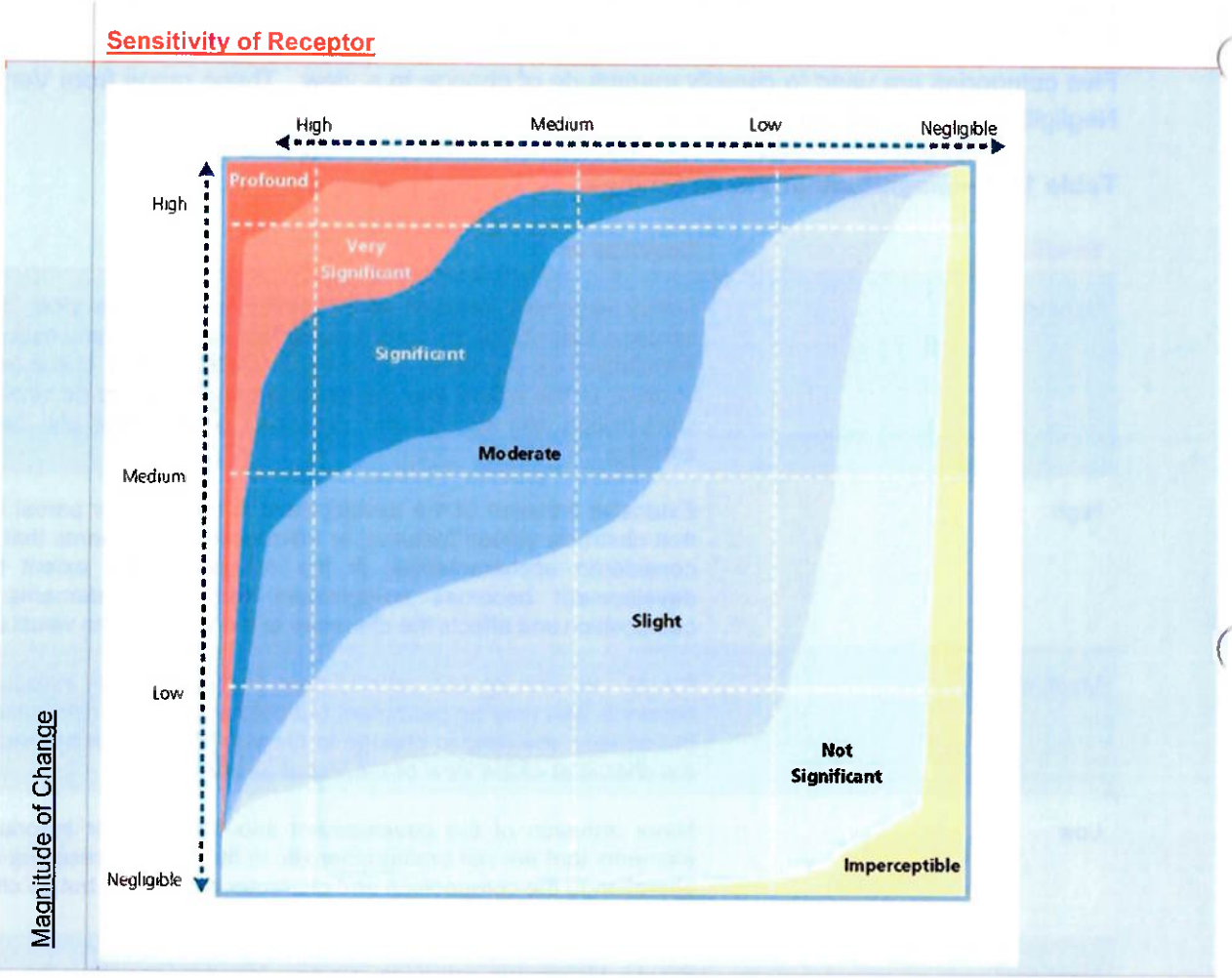
Significance of Effects

In order to classify the significance of landscape and visual effects, the predicted magnitude of change is measured against the sensitivity of the landscape/viewpoint. The definitions used by the EPA (2022) provide a useful scale to describe the significance of the effects.

There are seven classifications of significance, namely: (1) imperceptible, (2) not significant, (3) slight, (4) moderate, (5) significant, (6) very significant, (7) profound.

The relationship between the magnitude of change and sensitivity of the receptor with the varying classifications of Significance is illustrated on the below extract from the EPA (2022) Guidelines (with labels amended and simplified based on GLVIA (2013 guidance):

Table 11-5 – Significance of Effect (Source: EPA 2022)



Note: This graphic is a guideline only, and an element of professional judgment is also applied. The assessor also uses professional judgement informed by their expertise, experience and common sense, to arrive at a classification of significance that is reasonable and justifiable.

The GLVIA 3rd Edition recognises (at para 2.23) that:

"professional judgement is a very important part of LVIA. While there is scope for quantitative measurement of some relatively objective matters, much of the assessment must rely on qualitative judgements."

Quality and Timescale

In accordance with the EPA (2022), the predicted impacts are also classified as beneficial, neutral, or adverse.

This is not an absolute exercise; in particular, visual receptors' attitudes to development, and thus their response to the impact of a proposed development, will vary. However, the methodology applied is designed to provide robust justification for the conclusions drawn. These qualitative definitions are included in Table 11-6, below. Impacts/effects are also categorised according to their longevity or timescale as in Table 11-7 further below.:

Table 11-6 – Quality of Effect (Source CSR based on GLVIA 2013)

Definition of quality of effects	
Adverse/negative	Scheme at variance with landform, scale, pattern. Would degrade, diminish or destroy the integrity of valued features, elements or their setting or cause the quality of the landscape (townscape) view to be diminished;
Neutral	Scheme complements (or does not detract from) the scale, landform and pattern of the landscape (townscape)/view and maintains landscape quality;
Beneficial /positive	Improves landscape (townscape)/view quality and character, fits with the scale, landform and pattern and enables the restoration of valued characteristic features or repairs / removes damage caused by existing land uses.

Table 11-7 – Duration of Effect (Source: EPA 2022)

Definition of duration of effects	
Duration	Description
Temporary	Effects lasting one year or less
Short Term	Effects lasting one to seven years
Medium Term	Effects lasting seven to fifteen years
Long Term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years

11.4 BASELINE

11.4.1 LANDSCAPE CHARACTER

Landscape character is described in terms of landform (topography and drainage), landcover (vegetation, built form, natural and cultural heritage) and Transport & Settlement Pattern. The Site (i.e. the EIAR project boundary) and immediate surrounds are described separately from the wider landscape.

11.4.1.1 Landform - Topography and drainage

Site and immediate vicinity

The existing landform within the quarry consists of a large ridgeline near the southern site boundary, which sharply drops down to the quarry floor. This area is divided up by elevated internal roadways with the lower heavily worked lands on either side of the road. There are some small ridges within this space and platforms cut into their steep slopes to allow working out of these outcrops (Figure 11-8, below). Three small water bodies have formed where the area of extraction has fallen below the existing ground water table level.

The quarry's terrain varies from a high point of approximately 270 mAOD by the rock face marking its southern boundary to the lowest point of approximately 188 mAOD, found on the quarry floor. A small waterbody sits within this area of farmland directly north of the quarry's boundary edge (Figure 11-9, below).

Figure 11-8: Internal views of the quarry's worked out land (a) looking southwest towards the southern boundary by thewoodlands at Deerpark and (b) looking west towards the homes and farmsteads off the R410 road

Figure 11-9: View of small waterbody within the site located just north of the existing quarry limits.

Wider Area

The landform found throughout the study area is distinguished by two distinctive characters, which result in the 'sense of place' being considerably different as one moves from west to east, and north to south. This is largely due to the distinct hill range running northeast-southwest through the study area, rising from 281 mAOD in the southwest at Carrigeen, to 379 mAOD at Cupidstown, in the northeast, which principally separates County Wicklow (i.e. east of the range) from County Kildare (i.e. west of the range). West of the range, land undulates between 100 mAOD and 200 mAOD, and is relatively mild in terrain, punctuated by a handful of small streams. East of the range, in County Wicklow, landform is more dramatic, varied and picturesque. The lower slopes of the Wicklow Mountains lie in the south and southeast of the study area (Figure 11-10), with the "Blessington Lakes" (i.e. Poulaphouca Reservoir) occupying the large basin in between the mountains and the aforementioned hill range (Figure 11-11). The River Liffey feeds into the reservoir in the far east of the study area.

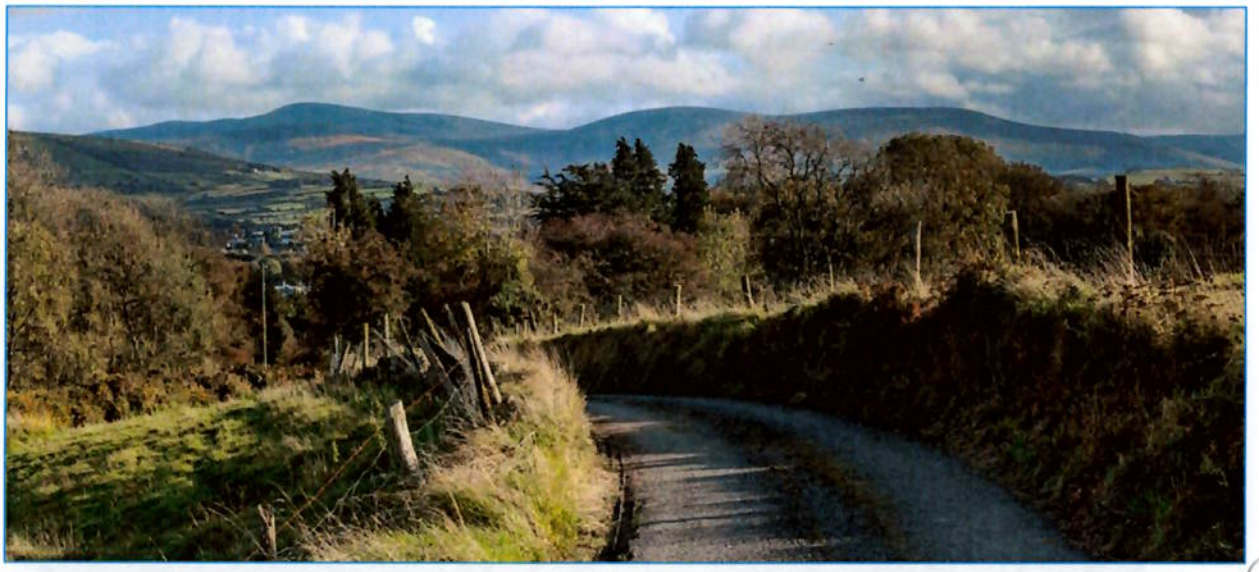


Figure 11-10: The Wicklow Mountains, as seen in the distance, are in the south and southeast of the study area

Figure 11-11: Poulaphouca Reservoir with the aforementioned hill range in the distance, which runs northeast- southwest through the study area

11.4.1.2 Landcover – Built Form, Vegetation and Cultural Heritage

Land use

Site and immediate vicinity

The land use within the Site consists of the operating quarry and adjoining pasture. Farmland within the Site contains approximately eight small to medium scale fields bounded by hedgerows of mature individual hawthorns, among other low-tree species (Figures 11-14 & 11-15). The Site is also bounded

on its south by the northeastern edges by farmland (identified in the background of Figure 11-12), and that of Deerpark, a public, mixed deciduous and conifer woodland. Contained with the worked lands of the quarry are supporting ancillary structures, including offices, welfare facilities, processing plant machinery and temporary stockpiles, the plant machinery workshop and parking (Figure 11-13).

Figure 11-12: Current extraction activity occurring at the northwest end of the existing quarry

In terms of protected recorded protected structures (RPS), national recorded monuments and places (RMP) or non-protected National Inventory of Architectural Interests (NIAI) buildings and structures, there are none such within the site, nor any other cultural heritage assets found within the Site limits or its immediate surroundings.

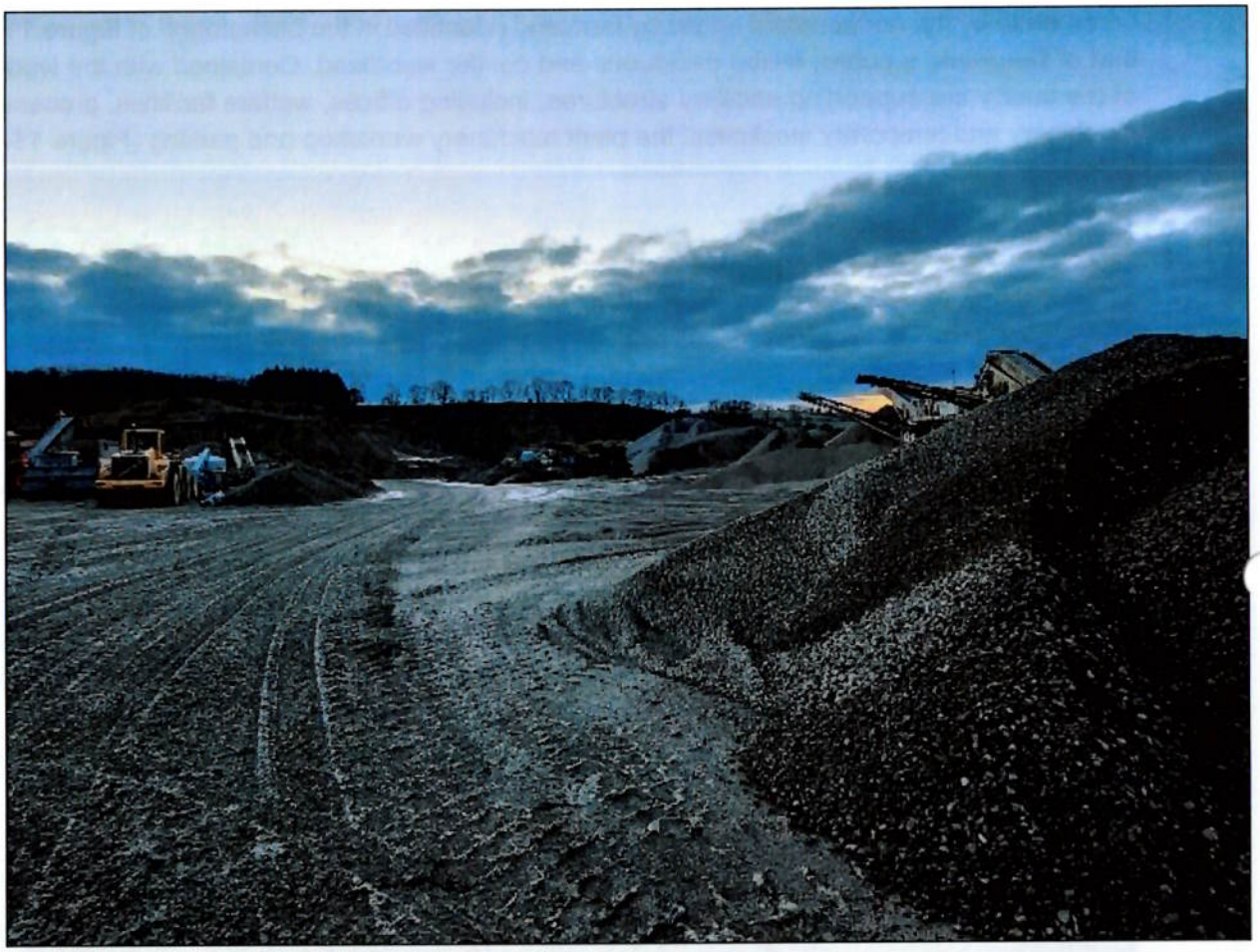


Figure 11-13: Current temporary stockpiling off of the extracted material next to the processing plant in southeastern end of the quarry

Figure 11-14: The existing field hedgerows, as viewed from the northern edges of the existing quarry limits.

Figure 11-15: Pastoral fields partially visible to the west of the existing pit outline, where the proposed development is proposed to marginally extend into – viewed from the northeastern site boundary, looking across existing quarry pit.

Wider Area

The immediate lands next to the Site include other existing operational quarries to the south and east, which align the Kildare and Wicklow County border. The nearest of these is Hudson Wicklow quarry, from which the Site is accessed, which is also located off the N81. This collection of quarries, including the Site, extends across an area of land covering approx. 2 km (northwest-southeast) by approx. 1.4 km (northeast-southwest), in places. The elevated and/or hilltop location of these quarries results in them being visible from several local receptors (Figure 11-16). Another nearby former quarry is located on the opposite/easter side of the N81, within the northern end of Blessington town. Other quarries within the wider extent of the study area include approx. 2.3km east of the Site at Hempstown Commons and approx. 3.6 km west of the Site at Walshestown.

Figure 11-16: Overview of hill range (in distance) along which opencast quarries are evident for over 2 km.

Other land uses across the County Kildare and Wicklow sections of the study area are overwhelmingly pastoral in nature, with medium-large sized fields with mature field boundaries (Figure 11-17). Some small conifer plantations and deciduous woods are scattered through this farmland. The largest mixed woods are found next to the Site at Deerpark and along the southwestern end of the study area by the Poulaphouca Reservoir. The various small settlements/villages and town of Blessington found within the study area are mostly of residential use, although there are also some retail/commercial/educational uses, along with the above-mentioned quarries within the town limits. The large Poulaphouca reservoir on the edge of Blessington serves as a rich natural habitat designated as a SPA and pNHA and provides various recreational activities and a public water resource.

There are various cultural heritage assets found across the wider study area reflecting its rich historic past. Many of those assets found across the rural lands are RMPs (Record of Monuments and Places), which consist of the likes of enclosures or burials, and are typically located on higher lands. RPS built structures are also found within the centre of the settlements of Blessington, Easdestown and Rathmore and include the likes of churches, houses and other public buildings. However, some other non-protected historic buildings within these settlements are listed within the NIAI.

Figure 11-17: View towards the site, from lower slopes of the Wicklow Mountains, in the south and southeast of the study area.

11.4.1.3 Transport and settlement pattern

The regional R410 road is located within 400m to the west of the Site and the N81 National Road is located approximately1.5km to the southeast. This national secondary road connecting Tullow, Co. Carlow, with the M50, is the primary transport corridor within the study area and runs through the centre of Blessington town. There are some regional roads leading off the N81, but most roads within the study area are local/minor roads serving the rural hinterland. The Site is located directly north of the town boundary of Blessington. This northern end of the town boundary includes the adjoining quarries and woodlands, with the town centre of Blessington located approximately 2.14 km northwest of the Site's southern boundary edge.

Wider Area

The nearest settlements to the Site within County Kildare include the small villages of Eadestown (approx. 2 km northwest of the Site) and Rathmore (approximately 2.7 km north of the Site). Across the various regional and local networks are individual and clusters of rural dwellings, of which there are 25 rural 'one off' dwellings found within 500m west, northwest, north and northeast of the Site. The relatively high density of these settlements and clustering of rural residences is reflective of the area's popularity due to its well-renowned natural beauty and proximity to the city of Dublin.

11.4.2 LANDSCAPE VALUE

The landscape values of a site can be identified through formal designations which infer landscape value, as well as values which are not enshrined in policy but are evident on the site. These values are listed below and can be further categorised in two ways: values which should be conserved, and values that provide opportunity for enhancement. However, in addition to formal designations at international, national and local level, the GLVIA 2013 recommend the use of a number of criteria which can help to describe landscape values. These include:

Landscape Quality/Condition

- Heritage/Conservation interests
- Scenic Quality
- Rarity
- Perceptual aspects
- Recreation Value

Conservation values

The conservation values indicate those aspects of the receiving environment which are sensitive and could be negatively impacted on by the development. These values form the potential landscape and visual constraints to the proposed development. These include:

- Rural characteristics of the section of fields that make up part of the Site.
- Conserving trees/treelines and hedgerows across field boundaries of the site and the adjoining woodland.
- The small water bodies and tree/bush lined ridgelines.
- Scenic or picturesque views experienced from the surrounding area which include some designated views and include views towards the Wicklow Hills and Poulaphouca Reservoir.

Enhancement Values

The enhancement values reflect change that is occurring in the landscape and its inherent robustness and identify elements which could be enhanced. These could relate to achieving socio-economic benefits. These include:

- Area of intensive quarrying active within part of the Site and surrounding lands.
- Weak field hedgerows boundaries and large parts of land of low ecological value.
- Proximity to settlement of Blessington and future pressure for its continued growth.

11.5 SELECTION OF SENSITIVE RECEPTORS

11.5.1 VISUAL RECEPTORS

Visual receptors, as outlined in the visual methodology section, can range from High to Negligible sensitivity. More sensitive visual receptors include those involved in recreation, or at amenity areas where there is a focus on a scenic landscape, or residents with views of scenic quality. Less sensitive receptors would include those driving at higher speeds or those engaged in activities where there is not a focus on the landscape and where the views are not considered of high quality.

A total of 13 no. viewpoints have been selected for assessment in this LVIA, which considered a range of views, including those from nearby residential properties, elevated sections of road and designated county Kildare/Wicklow scenic routes and views within the study area.

Viewpoints

The 13 No. selected viewpoints are listed in Table 11-8 and mapped in Figure 11-18 below. The potential visual impact of the proposed development upon these receptors are assessed in the visual assessment section.

Table 11-8 – Viewpoint Locations

Viewpoint Number	Viewpoint Description	Distance and Direction from site boundary
1	Elevated local road at Kilbride townland	4.07 km E
2	Designated Wicklow County "Prospect" overlooking Poulaphouca Reservoir	4.19 km SE
3	Designated Wicklow County "Prospect" at Baltyboys along the R758	4.35 km S
4	Ring road along northern periphery of Blessington Town	1.67 km S
5	Elevated third class road southwest of site, at Newtownpark townland	1.18 km SW
6	R410 west of site, at Athgarrett townland	270 m NW
7	R410 northwest of site near Carter's Hill	1.19 km NW
8	Third class road at Baysland townland	3.75 km NW
9	County Kildare scenic route, near Kilteel village	3.74 km NE
10	Dead-end third class road east/north-east of site	60 m E
11	County Kildare scenic route, at Greenmount townland	700 m NE
12	Residences along the R410, southwest of site	280 m SE
13	Residences along short cul de sac at Wolfestone townland	5 m W

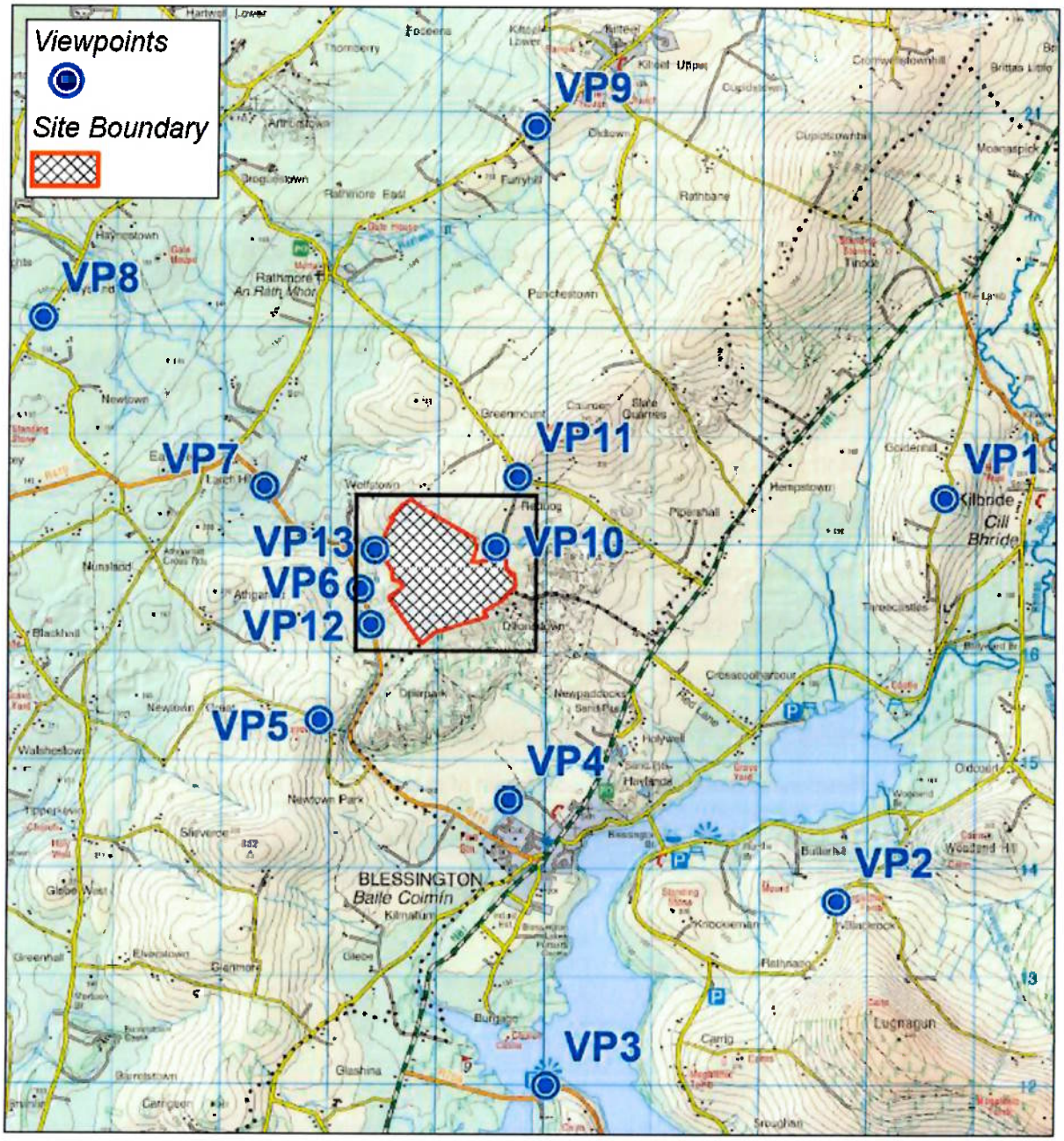


Figure 11-18: Viewpoint Location Map (Source: Macro Works Ltd)

11.6 POTENTIAL EFFECTS

11.6.1 LANDSCAPE EFFECTS

11.6.1.1 Landscape Sensitivity

Application Site and Immediate Vicinity

The site of the development consists of an active quarry with some pastoral fields to the north, with the pastureland in the southwest being located on or close to a ridgeline. It is worth noting that the site

is within 300 m of a ridgeline, mixed forestry and "agricultural land with natural vegetation." Thus, the compatibility of sand and gravel extraction is "very unlikely to be compatible" (i.e. '0' rating) if located within 300 m of a ridgeline; "compatible only in certain circumstances" (i.e. '2' rating) if located within 300 m of mixed forestry and is "likely to be compatible with great care" (i.e. '3' rating) if located within 300 m of "agricultural land with natural vegetation."

The Site's existing quarry and the neighbouring operational quarries within county Kildare and Wicklow are of 'Low sensitivity.' The surrounding pastureland and field boundaries within the site and the surrounding rural landscape is of a 'Medium sensitivity.'

Thus, overall, the landscape of the site and immediate vicinity is deemed to be of '**Medium-low.**'

Wider Study Area

The areas of higher sloping lands and hills of the Eastern Uplands LCA, which are designated by KCC as a High Amenity Area, are noted as having a 'High sensitivity.' This is defined by the council in the KCDP as:

"Areas with reduced capacity to accommodate uses without significant adverse effects on the appearance or character of the landscape having regard to prevalent sensitivity factors."

This 'High Sensitivity' is due, in part, to the profiles of these hillsides being viewed alongside the Wicklow Hills against the skyline from the lowland plains that cover much of the county and provided elevated views of the county, as well as towards the Wicklow hills and Poulaphouca Reservoir. The Landscape character assessment also considered the compatibility of the Eastern Uplands as having 'medium compatibility' for sand and gravel extraction.

Thus, the wider landscape is deemed to be of a '**High**' sensitivity.

11.6.1.2 Magnitude of Landscape Effects

Summary of Operational Stage Effects on the Physical Landscape of the Site

From an LVIA perspective, the leading objectives of the proposed development have been addressed above, in Section 11.1.2 and is set out in considerably more depth in Chapter 2 Project Description. It should be noted that it is proposed to extend the existing quarry void in a phased manor. In order to better address and assess the effects on the physical landscape of the Site, the four phases of the proposed works require examination.

Phase 1:

It is proposed to maintain the existing fence along the length of the Site boundary and to maintain native hedgerows that align this fence. In addition, new areas for extraction will be securely fenced around the perimeter and planted with native hedgerow species to provide screening.

A buffer area will be developed around the existing pond/surface water body located to the north of the main extraction area and east of the northern lateral extension. The area surrounding this waterbody will be planted and will extend 3-5 m surrounding the waterbody. The buffer will be composed of a wet woodland mix of willow and alder and the remainder of the buffer areas will be allowed to naturally colonise with aquatic and marginal plants. Topsoil and overburden stripped from the proposed extraction areas (Areas A, B, C, D & E) will be removed and used to construct new existing safety/screening berms in appropriate locations to screen active working areas. A new 6 m

safety/screening berm in the northeast of the lateral northern extension will be constructed to establish visual, safety and acoustic screening.

The security fence around the perimeter of the Site (i.e. planning boundary) will be maintained, with a perimeter access track around the inside of the security fence and outside the screening berm.

Phase 2:

During this phase of the development, it is proposed to continue to develop the quarry in Areas B, C and D to allow for blending of this valuable resource, with topsoil and overburden being striped ahead of the advancing faces. This phase will include a:

- 3D topographical survey and planning boundary of the site.
- 3m wide access track between planning boundary and outside edge of screening berm.
- 2m high screening berm with 1 in 1.5 slopes on either side.
- 1 in 2 excavation slope from edge of inside access track surface to base of overburden.
- 1 in 1.5 excavation slope from base of overburden to base of sand and gravel.
- 3m stand-off on rock-head (i.e. between base of sand and gravel slope and top of rock 'cut').
- 7.5m wide benches with edge protection.
- 70º slope from top of rock-head to bottom of quarry face (depending on ground conditions).
- Maximum 20m high benches where design and ground conditions allow.
- Safety berms/edge protection should be >1.5m or higher than the radius of the largest wheel/tyre.

Safety/screening berms will be constructed outside the appropriate exclusion zones. Boundary hedgerows will be developed and left intact for the life of the quarry (and in perpetuity to continue to provide biodiversity to the Site and the local environment). Berms and planting in this area will serve to mitigate against noise and potential dust emissions from the Site, as well as offer reduced visibility of the Site from surrounding lands.

Phase 3

It is proposed that during this Phase of the development that ongoing production from Area B will take place for rock, and from Areas C, and Area E for sand and gravel. Extraction of rock will continue in Area B in a westerly direction to the Site boundary, with extraction of sand and gravel continuing in Areas C but ceasing in Area D. Stripping of topsoil and overburden will continue in Area E, with stripped materials used in the construction of screening berms. Surplus stripped materials from Area E will be stored in temporary stockpiles for use in the restoration on cessation of quarrying. During this Phase of the operation, Area D will undergo restoration.

Having a number of different operating faces will allow for blending of materials of variable quality from different parts of the Site and help to ensure efficient use of this valuable resource. However, as noted previously, not all faces identified will be operational at any one time. During this phase of the operation, the quarry faces will be pushed back to their extraction limits

Phase 4 - Restoration

Following cessation of extraction, the Site will be restored to a mixture of grassland, hedgerows, woodland and two waterbodies. The Site restoration will be carried out in line with the Site Restoration Plan (submitted with this Application).

It is expected that the final restoration will be completed in 2 to 3 years following the cessation of extraction activities. An additional waterbody will be located in the northern section of the main pit, following cessation of quarrying, which will also add to the biodiversity of the area. Water is trapped by clay/silt layers in the sand and gravel deposit in this region. Similar features exist throughout the landscape to the west and north of the Site and also the Red Bog SAC. It is anticipated that this waterbody and the waterbody identified in Phase 1 will be of similar composition and complement each other in the restored landscape with both enhanced with planting up of native marginal and wet woodland species offset from their water edges

In addition, the Site will undergo planting of grassland, native tree and shrub species. Indigenous plant species will be encouraged to re-colonize worked out areas (benches) to develop unique habitats and provide for increased biodiversity in the area. A native wildflower and grassland mix will be planted on finished sand and gravel faces (not steeper than 1(V): 2.5(H)). All seed mixes will be agreed with the local authority in advance. Inter-mixed with the planting of native trees and scrubs, restoration surfaces will be seeded with native grasses and wildflowers to provide increased biodiversity. Areas for grassland restoration will be dressed with ca. 0.3 m of topsoil and re-seeded with a grass seed mixture, similar to that used on adjoining lands. The Site's northern end will consist of reinstated agricultural lands and its southern half of native grassland meadow.

Vertical faces which remain along the southern and western part of the Site will be maintained and enhanced to promote biodiversity. Upon decommissioning of the Site, it is the Applicant's intention to reinstate the majority of the site back to agricultural use, with a waterbody in the mid-western part of the Site. All plant, equipment and temporary structures shall be decommissioned and removed from the Site.

Assessment of Magnitude of Operational Landscape Effects

In terms of physical effects on the Site, the proposed development will result in a distinct and permanent alteration to the topography, drainage and landcover of the Site. Ca. 28 ha of existing pasture, ca. 2.75km of hedgerows and treelines; ca. 2.7 ha of dry meadows and grassy verges and ca. 0.19 ha of scrub will be removed as a result of the proposed pit extension.

However, as part of the restoration plan, it is proposed to plant ca. 2.88 km of hedgerows; 4.79 ha of a woodland mix (to serve as a screening buffer along site boundaries); 15.9 ha of a Wet Woodland Mix (by the two water bodies and by northeast corner of the site); 890 m^2 of marginal planting around the two water bodies (in addition to the wet woodland areas); 13.1 ha of reinstated agricultural grassland; 23.1 ha of native grassland meadows, as well as 18.16 ha for natural colonization. Consequently, to facilitate the phased expansion of the proposed quarry, it will have a permanent effect on the landform and land cover of the Site.

During the operational phase of the proposed development, the movement of heavy vehicles within, as well as to and from, the Site will add further intensity of activity and movement, albeit within a context of an already existing busy quarry and study area where other operational open-cast quarries are present, along with their attendant number of heavy vehicles during working hours. In relation to landscape character, this proposed development is essentially a measured but sizeable extension of the existing pit. The magnitude of landscape effects is also softened by the:

- Extent of existing and proposed native planting aligning the boundaries
- Extent of proposed screening berm system aligning the boundaries
- Extent of the Phase 4/ restoration phase of the proposed development.

As previously noted, there are several other quarries within the vicinity that contribute to the landscape character of the area. In this regard, the proposed development does not represent a new or uncharacteristic form of development within this landscape setting, and, therefore, is not considered that the proposal is out of keeping with the receiving landscape context. Consequently, landscape and visual **mitigation measures are 'embedded' within the design of the proposed development, and no additional** mitigation measures would be likely to discernibly reduce any potentially unfavourable/unwanted landscape or visual impacts associated with this scheme.

In terms of duration, the proposed development is anticipated to have an approximate 13–15-year life (i.e. Phases 1-3), depending on market conditions,. According to the Environmental Protection **Agency's (EPA) EIA** *Guidelines,* **"medium-term effects" are defined as lasting 7-15** years. The operational life cycle of the proposed development, therefore, is characterised as having medium-term effects.

On the basis of the factors discussed above, it is considered that the magnitude of operational landscape impact on the Application Site will be Medium, in accordance with Table 11-2. Meanwhile, the **magnitude** of landscape effects on the study area is likely to be **Low-negligible**, in accordance with Table 11-2.

Summary of Operational Landscape Effect Significance

Application Site and Immediate Vicinity:

With reference to the significance matrix (see Table 11.5, above), the magnitude of landscape impact within the Application Site is deemed to be Medium. Thus, when combined with a Medium-low sensitivity, the significance of operational landscape impact is not considered, on balance, to likely be any greater than **Moderate** within the immediate context of the Site. In addition, the quality of Effect is deemed to be Adverse/negative (in accordance with Table 11-6, above) and the Duration of Effect is deemed to be **'Medium Term' (in accordance with Table 11-7**, above).

Wider Study Area:

With reference to the significance matrix (see Table 11.5, above), the magnitude of landscape impact within the wider study area is likely to be Low-negligible, based in part on the presence of multiple quarrying activities within 2km of the site. Thus, when combined with a High sensitivity, the significance of operational landscape impact is not considered, on balance, to likely be any greater than **Not Significant** within the wider study area.

Summary of Restoration Stage Landscape Effects

The proposed restoration will involve a reduction in the severity of internal slopes and pit faces for safety reasons and also to facilitate planting of native grassland, hedgerows, woodland and waterbody, but is by no means a reinstatement of the pre-existing landform or land cover. Indeed, a sizeable void will remain in this landscape, albeit softened in appearance by moderated slopes and planting. Agricultural land use is envisaged to return to some parts of the restored quarry, but not to the extent that currently exists. Another important factor is that intense quarrying activity and heavy vehicle movements will cease once the operational stage of the quarry ends and restoration works are complete.

Application Site and Immediate Vicinity:

On the basis of the factors discussed above, , it is considered that the **magnitude** of restoration landscape effects on the Application Site will reduce to **Medium-low**.

When combined with Medium-low sensitivity judgment, the **significance** of restoration-stage landscape effects is not considered, on balance, to be any greater than **Moderate-slight** within the immediate context of the Site, in conjunction with Table 11-5, above.

In terms of duration of effects, the proposed restoration is anticipated to take 2-3 years. According to the Environmental Protection Agency's (EPA, 2022) EIA *Guidelines,* "short-term effects" are defined as lasting 1-7 years. The restoration stage of the proposed development, therefore, is characterised as having short-term effects.

Wider Study Area:

On the basis of the factors discussed above, it is considered that the **magnitude** of restoration-phase landscape effects on the wider study area is likely to reduce to **Low-negligible**.

Thus, when combined with a High sensitivity, the **significance** of restoration-phase landscape effects is likely to reduce rapidly to **Imperceptible** with increasing distance from the site, in conjunction with Table 11-5, above.

In terms of duration of effects, the proposed restoration is anticipated to take 2-3 years. According to the Environmental Protection Agency's (EPA, 2022) EIA *Guidelines,* "short-term effects" are defined as lasting 1-7 years. The restoration stage of the proposed development, therefore, is characterised as having short-term effects.

11.6.2 VISUAL EFFECTS

11.6.2.1 Zone of Theoretical Visibility (ZTV)

Computer generated Zone of Theoretical Visibility (ZTV) maps have been produced as part of this LVIA. A ZTV map indicates areas of the landscape that have potential visibility of the site in a bare-ground scenario. In this high-level context, one of the main benefits of this computer-generated analysis is to understand where in the surrounding landscape the development definitely will not be visible, due to terrain or other screening.

In this instance, two separate ZTVs were prepared in order to determine the potential visibility of the proposed development in a bare-ground scenario. The first is a ZTV entailing the EIA Study Area includes the Site Application Area and proposed pit extension areas (Figure 11-18). The second is a 'Delta' (i.e. a comparative) ZTV, which compares visibility between the existing quarry and the proposed extension areas (Figure 11-20).

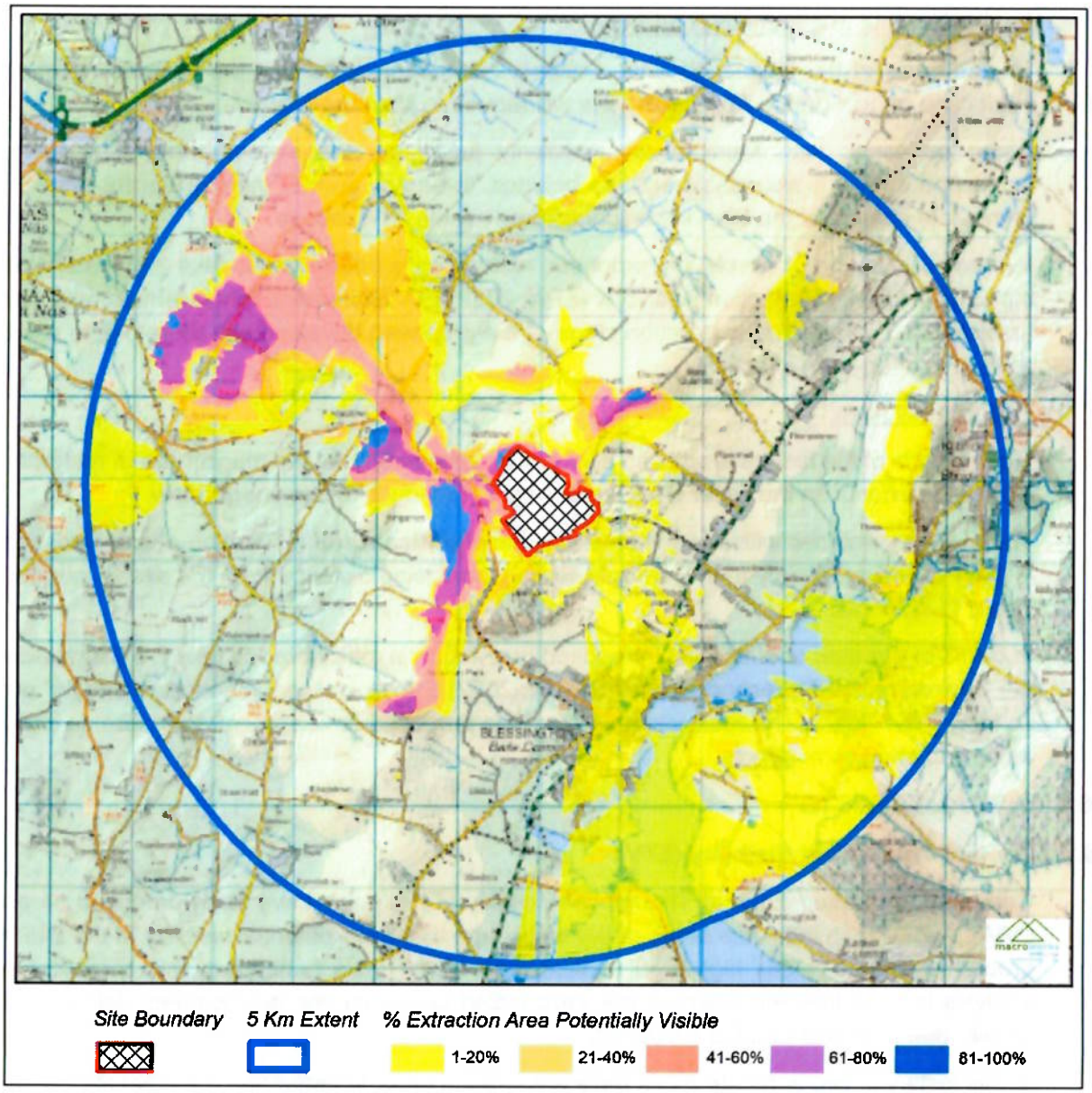


Figure 11-19: ZTV entailing the site application area, including the existing *and* proposed extension areas

The main points in relation to the ZTV map on **Figure 11-19** (above) entail:

- More than half of the study area will have no potential for visibility of the existing pit and proposed extension areas. This is principally a result of the aforementioned hill range, which the Site is located adjacent to.
- The highest theoretical visibility (i.e. 81-100% of extraction area) will be experienced within elevated, private agricultural land less than 1 km west of the Site boundary (i.e. not in the public realm and containing no known residences).
- Within Co. Wicklow, there will be an exclusively low theoretical visibility (i.e. 1-20% of extraction area) of the existing pit and proposed extension areas from the Poulaphouca Reservoir (i.e. Blessington Lakes) and the foothills of the Wicklow Mountains. These areas

include two Areas of Outstanding Natural Beauty (the Mountain Uplands AONB and the Poulaphouca Reservoir AONB), as well as a Special Protection Area and two Proposed Natural Heritage areas, in addition to the two aforementioned Co. Wicklow designated prospects.

- Within Co. Kildare, there will be a range from low to high theoretical visibility of the existing pit and proposed extension areas, along up to 2 km of the aforementioned Scenic Route located within 1 km northeast of the Site.
- In the northwest of the study area, there is a relatively high theoretical visibility (i.e. 61-80% of extraction area) within mostly private agricultural land, as well as less than 1km of public roads. However, such areas are located more than 3km from the site.
- For the majority of the town of Blessington - the largest settlement in the study area - there is a low theoretical visibility (i.e. 1-20% of extraction area) of the existing pit and proposed extension areas, while extensive areas of the wider town will be 'out of' ZTV (i.e. no theoretical potential for views of the proposed development).

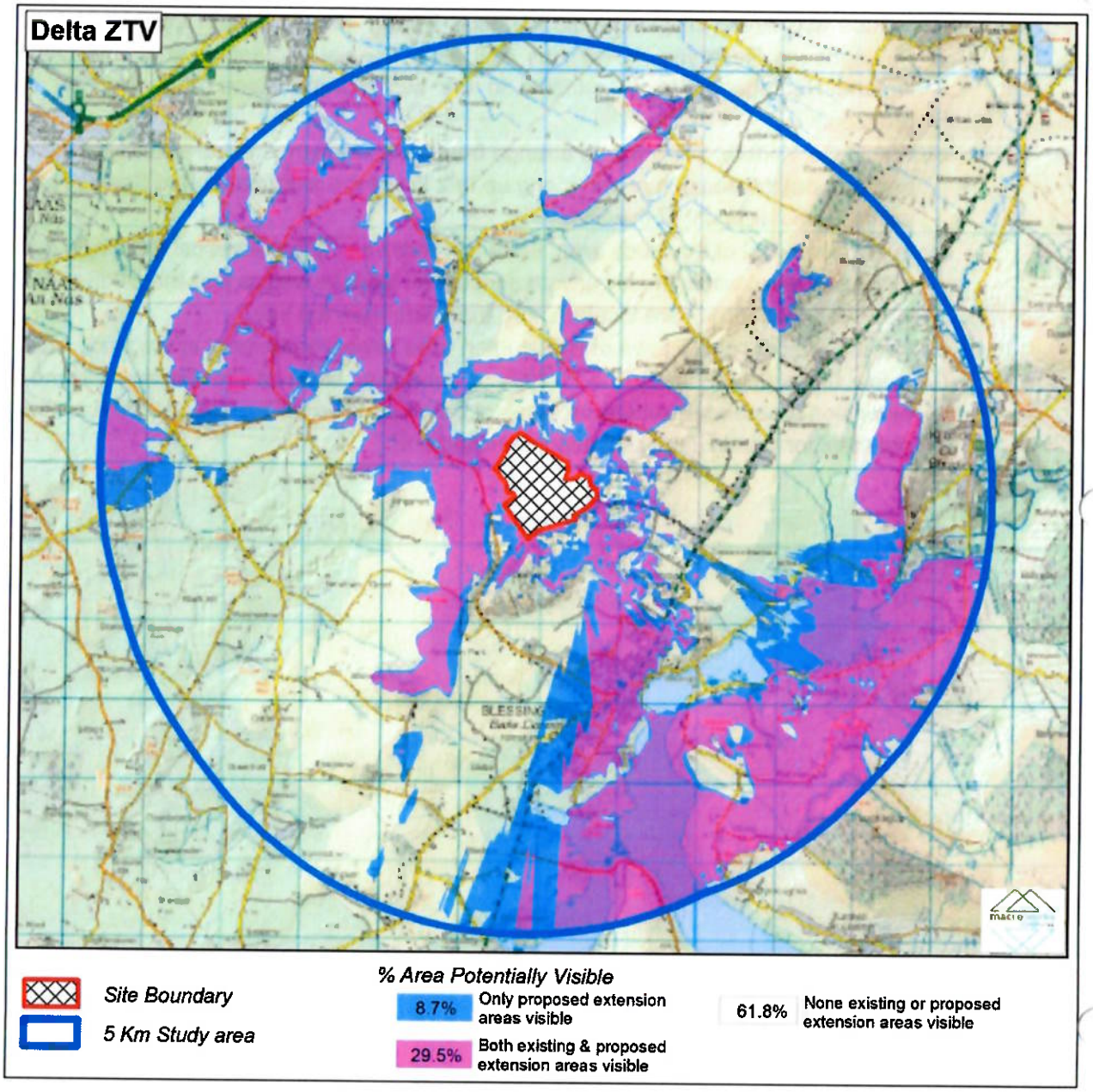


Figure 11-20: Comparative ZTV entailing the site application area, including the existing pit & proposed pit extension

The main points in relation to **Figure 11-20** entail:

- Less than 9% of the study area experiences theoretical visibility of only the proposed extension areas in isolation.
- Less than 30% of the study area experiences theoretical visibility of both the existing pit and the proposed extension areas. These areas include most of Blessington, the Poulaphouca Reservoir (i.e. Blessington Lakes) and the foothills of the Wicklow Mountains. These areas include two Areas of Outstanding Natural Beauty (the Mountain Uplands AONB and the Poulaphouca Reservoir AONB), as well as a Special Protection Area and two Proposed Natural Heritage areas, in addition to two Co. Wicklow designated prospects.

- Almost 62% of the study area has no potential for visibility of either the existing pit or the proposed extension areas.

However, it is worth emphasising that any ZTV map only indicates areas of the landscape that have potential visibility of the site in a bare-ground scenario. It does not take into account the multiple factors that may, and typically do, screen a proposed development from a series of viewpoints, such as intervening vegetation, buildings, energy/communications infrastructure, walls and/or roadside embankments/ditches. In relation to likely visibility of any proposed development, a ZTV's major value is in determining those areas in the study area where the development definitely will not be visible.

11.6.2.2 Viewpoint Assessment

The 13 No. viewpoints to be assessed in this section are listed and mapped on Table 11-8 and Figure 11-18. This section should be read in conjunction with the attached Appendix 11-B of this EIAR, which includes verified photomontages from all 13 No. Viewpoints.

Viewpoint 1 - Elevated local road at Kilbride townland

Existing View

The view is located along a third-class road which is aligned along the top of a local hill that rises to just over 280 mAOD and which contains groups of rural residences. Outward views are contained by the roadside embankment and low scrub vegetation, although there are breaks across to the surrounding hillside which the Site is located along. The foreground view includes a pasture field enclosed by wire fencing alongside the road. Beyond the field the land drops down for over 1km before rising to form distant hills in the background. Set within these hills amongst pastures and conifer plantations are large areas of partially visible open cast quarrying. However, the partially visible quarry's workings do not belong to the Site or its immediate vicinity, as the site is hidden from view by the intervening ridgeline.

The viewpoint sensitivity is **Medium-Low** as representative of local community views

Visual Effects

The proposed development will not be visible from this location due to screening by the ridgeline and presence of vegetation along it. Thus, it will have no potential for visual effect on the existing view.

The magnitude of change will be **None.**

The significance of change will be **No Change** in the Short, Medium and Long Term.

Qualitatively, the effect will be **N/A** (i.e. Not Applicable).

Viewpoint 2 - Designated Wicklow County "Prospect" overlooking Poulaphouca Reservoir

Existing View

This viewpoint is from a local road that is designated as 'Prospect 20' scenic route in the Wicklow County Council. This location unveils picturesque views of its listed features (i.e. designated views) that is the Poulaphouca Reservoir/Blessington Lakes. However, the proposed development is set

back more than 2km from the Poulaphouca Reservoir. In this view, the low hillscape on which the Site is set, appears as a low sweeping horizon. At over 4 km distance, little detail can be determined about land use upon the hillscape, aside from clumps of pasture and woodland/forestry. An irregular, soil-coloured area along the distant hillscape infers the presence of open cast quarrying. However, the Site is hidden from view by the intervening landform and vegetation.

The viewpoint sensitivity is **Medium**, as representative of local community views.

Visual Effects

The proposed development will not be visible from this location, due to screening by the ridgeline and presence of vegetation along it. Thus, it will have no visual impact or effect on this viewpoint.

The magnitude of change will be **None.**

The significance of change will be **No Change** in the Short, Medium and Long Term.

Qualitatively the effect will be **N/A**.

Viewpoint 3 - Designated Wicklow County "Prospect" at Baltyboys along the R758

Existing View

The viewpoint is located further along the same Wicklow County Council designated scenic route 'Prospect 20'. Similarly, this scenic view primarily unveils picturesque views of its listed features (i.e. designated views) that is the Poulaphouca Reservoir/Blessington Lakes. However, the development is set back more than 2 km from the Poulaphouca Reservoir. Across the lake/reservoir, an abundance of tall deciduous woodland tends to block most views, including that of Blessington town. Upon the skyline above these lakeside trees, the mature trees within the hilltop Deerpark woodland can be made out. This hill's ridgeline and the lines of trees help to prevent the Site's existing quarry being visible from this point.

The viewpoint sensitivity is **Medium**, as the view is representative of local community views and major routes.

Visual Effects

The proposed development will not be visible from this point, due to screening by the ridgeline and presence of vegetation along it. Thus, it will have no visual effect on this viewpoint.

The magnitude of change will be **None.**

The significance of change will be **No Change** in the Short, Medium and Long Term.

Qualitatively, the effect will be **N/A.**

Viewpoint 4 - Ring road along northern periphery of Blessington Town

Existing View

The viewpoint is located along a ring road on the northern periphery of Blessington town. This area of the town has experienced considerable expansion, construction and settlement in the last 20 years, and is characterised by several relatively recent housing developments, with further expansion of housing anticipated in this area. This location offers the clearest potential for views in the direction of

the Site. The field in the foreground once formed part of the Blessington Demesne and is hitherto free of any residential development. In the distance, evidence of an adjacent open cast quarrying can be discerned on the skyline. However, the Site's existing quarry is not visible from this point due to its location set behind the existing hillside.

The viewpoint sensitivity is **Low** as the view is representative of a centre of population.

Visual Effects

The proposed development will not be visible from this point, due to screening by intervening vegetation and/or landform. Thus, it will have no visual effect on this viewpoint.

The magnitude of change will be **None.**

The significance of change will be **No Change** in the Short, Medium and Long Term.

Qualitatively the effect will be **N/A.**

Viewpoint 5 - Elevated third class road southwest of site, at Newtownpark townland

Existing View

The viewpoint is located along a short, elevated section on the brow of a hill along a quiet third-class road with few residences along it, located more than 1km southwest of the Site. This elevation allows for partially open views in the direction of the Site. Beyond the field in the foreground is the distinctive block of mature trees of the Deerpark woodland, which blankets that low hill. Further to the north of this woodland, and set below the more distant hills, is a particularly small section of the Site that can be faintly discerned from this location. This includes some of the upper worked quarry faces on its northern end, which can be faintly made out by their paler buff colour. However, this minute sliver of the site in unlikely to be noticed, in light of the more compelling and attractive hillscape scenery to the fore and beyond the site.

The viewpoint sensitivity is **Medium-Low**, as the view is representative of local community views.

Visual Effects following completion of Phase 3

A thin horizontal sliver of land use within the proposed development will be barely discernible, at over 1 km distance. In addition, some of the trees within the Site will have been removed. However, these changes will be highly unlikely to be detected by the observer, and even if located, will have no bearing upon the inherent visual amenity on offer from this location. Consequently, the magnitude of visual effect will be **negligible**.

Residual Visual Effects (i.e. post-mitigation)

Following the establishment of screen planting that will be part of the proposed development, the only tangible difference this residual view will offer will be the maturation of that planting. However, at over 1km away, such planting will be highly unlikely to be discernible. Thus, the magnitude of visual impact will remain **negligible**.

The significance of change will be **Imperceptible** in the Short, Medium and Long Term.

Qualitatively the effect will be **Neutral.**

Viewpoint 6 - R410 west of site, at Athgarrett townland

Existing View

This viewpoint is located along a busy regional road connecting Blessington with Naas. The road is well populated by single residences, of which there are four residences located within 140m of this location. Between a marginally taller roadside hedgerow (i.e. above eye level) and through a roadside field entrance, an undulating pastoral field is evident, visually 'split' by foreground trees. To the right/south of these trees, pasture ascends to a skyline marked by a mature, tree-lined field boundary, with the mature Deerpark woodland discernible on the most southerly skyline. To the left/north of the aforementioned trees, the terrain descends, while in the middle ground two berms (containing a gas network pipeline) are partially visible with their angular form backdropped by the undulating pastoral lands. Against the background and below the skyline, quarried materials from the existing Hudson Quarry can be made out, albeit at approx. 300 m distance and partially contained by the mature trees along the field boundaries.

The viewpoint sensitivity is **Medium-Low** - as the view is representative of local community views and major routes.

Visual Effects following completion of Phase 3

Upon completion of Phase 3 of the proposed development, some elements of the scheme will be visible. Beyond the aforementioned foreground trees, above a recently constructed berm, the upper 'lip' of the proposed quarry face will be discernible. This 'lip' will flow with the contours of the surrounding landform but will nonetheless demarcate the new skyline. To the left/north of the aforementioned trees, no visual change to the baseline is likely.

The loss of the treeline on the skyline will marginally detract from the visual amenity of this view, when combined with the 'foreshortening' of that skyline by at least 150m (i.e. from this viewpoint, the skyline at this location has moved approx. 150m westwards, in the direction of this viewpoint). However, while the lip of the proposed quarry extension will now define the skyline at this location, it is consistent with the undulating sweep of surrounding/pre-existing terrain. Nonetheless, such views through field entrances tend to be momentary and fleeting. In addition, this quarry lip is tangibly connected to, and consistent with, the quarry materials evident elsewhere in this scene. As a result of these factors, the magnitude of visual impact is deemed to be **Low**.

Residual Visual Effects (i.e. post-mitigation)

The former treeline on the skyline will be replaced with that of another. However, this new skyline will 'foreshorten' the skyline in this location, which signifies a fractional loss in visual amenity, when compared to the base line, although this will be partially offset by the creation of a more aesthetic treeline along the berm. On balance, the magnitude of visual impact is deemed to be **Low-negligible**.

The significance of change will be **Slight** up until completion of Phase 3, thereafter it will reduce to **Imperceptible** in the Long Term.

Qualitatively the effect will be **Adverse/negative.**

Viewpoint 7 - R410 northwest of site near Carter's Hill

Existing View

The viewpoint is located along the busy regional road on the southern approach to the small village of Carter's Hill and is over 1 km northwest of the Site's western boundary edge. The Site lands including the existing quarry is not visible from this location due to screening by the varied landform and roadside planting, as well as mature, tree lined field boundaries. Instead, the scene is of a rich pastoral landscape.

The viewpoint sensitivity is **Medium-Low**, as the view is representative of local community views and major routes.

Visual Effects following completion of Phase 3

Between branches of the foreground, roadside trees, a miniscule sliver of visibility of the proposed pit extension area will be partially revealed. This will disclose a somewhat tiny window onto the new quarry excavation. However, at over 1km distance, such a minute segment of the proposed development will be highly unlikely to be noticed by even the stationary passer-by, and even if discerned, will be unlikely to detract from the visual amenity on offer. On balance, it is deemed that the magnitude of visual impact is **negligible**.

Residual Visual Effects (i.e. post-mitigation)

Owing to intervening landform and/or vegetation, between this location and the proposed quarry extension area, the residual view of the proposed development from this location is unlikely to be any different to that available upon completion of Phase 1. Thus, the magnitude of visual impact remains **negligible.**

The significance of change will be **Imperceptible** in the Short, Medium and Long Term.

Qualitatively the effect will be **Neutral.**

Viewpoint 8 - Third class road at Baysland townland

Existing View

This viewpoint provides a brief vantage point at a field entrance along this a section of a third-class road (L2019), over 3.5 km from the site. This section of road contains ribbon development, from which several residences experience comparable views out over the countryside in the direction of the site. The mature tall field boundaries found in the direction of the Site obscure any views of the Site lands, including the existing quarry.

The viewpoint sensitivity is **Medium-Low**, representative of local community views.

Visual Effects

The proposed development will not be visible from this point, due to screening by intervening vegetation and/or landform. Thus, it will have no visual effect on this viewpoint.

The magnitude of change will be **None.**

The significance of change will be **No Change** in the Short, Medium and Long Term.

Qualitatively, the effect will be **N/A.**

Viewpoint 9 - County Kildare scenic route, near Kilteel village

Existing View

This view is located along the County Kildare Scenic Route 22, and this location is approx. 1km southwest of the small village of Kilteel. There are numerous residences located to either side of this low hilltop, third-class road that offers, in places, compelling views both north and south. Views from the road look beyond the sheep fencing and pastureland in the foreground across to the series of low undulating hills with some hill tops covered by small blocks of woodland. The intervening vegetation and landform screen any views of the Site and existing quarry.

The viewpoint sensitivity is **Medium**, as the view is representative of local community views.

Visual Effects

The proposed development will not be visible from this point, due to screening by intervening vegetation and/or landform. Thus, it will have no visual effect on this viewpoint.

The magnitude of change will be **None.**

The significance of change will be **No Change** in the Short, Medium and Long Term.

Qualitatively the effect will be **N/A.**

Viewpoint 10 - Dead-end third class road east/north-east of site

Existing View

This view is located along a *cul de sac* road, approx. 700 m long, off a third-class road, with approx. 10 rural residences located on the western side of the road. This viewpoint is located approx. 60m from the termination of the road and is also marginally inside the aforementioned Red Bog pNHA and lies adjacent to Red Bog SAC. Looking over a low, cut/maintained roadside hedge, views in the direction of the Site can be had. However, views largely entail a distant pastoral hillside, which lies considerably west of the development with the county's plains discernible, between foreground trees, further in the background. At the end of this short public road, a private laneway extends in the direction of the existing quarry, whose presence is implied by the perceived drop in more distant terrain. Part of the existing quarry's eastern end and far western end is faintly visible through the narrow gap between the tall trees either side of this laneway.

The viewpoint sensitivity is **Medium-Low**, as the view is representative of local community views.

Visual Effects

The proposed development will not be visible from this point, due to screening by intervening vegetation and/or landform. Thus, it will have no visual effect on this viewpoint.

The magnitude of change will be **Negligible.**

The significance of change will be **Imperceptible** in the Short, Medium and Long Term.

Qualitatively the impact will be **Neutral.**

Viewpoint 11 - County Kildare scenic route, at Greenmount townland

Existing View

This view is located along the County Kildare Scenic Route 12 and approx. 750m from the existing quarry limits. The section of road allows for elevated views looking down onto the lower undulating hills and distant plains within County Kildare to the northwest. The predominant land use of pasture is punctuated by mature tree-line field boundaries and some blocks of woodland on higher lands, including Deerpark. Similar visual amenity is experienced by residences located within the vicinity of this section of road. The varied landform and intervening vegetation make it challenging to discern the presence of the Site's existing quarry located in the bottom of this lowland valley.

The viewpoint sensitivity is **Medium**, as the view is representative of local community views.

Visual Effects following completion of Phase 3

Between and above intervening trees, a minute area of the proposed pit extension area will be partially revealed, which will form part of the proposed western extension of the quarry. However, at over 1 km distance, such a segment of the proposed development will be unlikely to be noticed by even the stationary passer-by. Thus, it is high unlikely to be noticed by road users along this scenic route and even if discerned, will be unlikely to detract from the visual amenity on offer. While this small segment may be more discernible to the nearby residents, it is also unlikely to have any discernible effect upon the inherent visual amenity of the scene. On balance, it is deemed that the magnitude of visual impact is **negligible**.

Residual Visual Effects (i.e. post-mitigation)

Owing primarily to the elevated terrain of this viewpoint (in comparison to the site), the proposed mitigation measures are unlikely to have any material bearing. Thus, the magnitude of visual impact will remain **negligible.**

The significance of change will be **Imperceptible** in the Short, Medium and Long Term.

Qualitatively the effect will be **Neutral.**

Viewpoint 12 - Residences along the R410, southwest of site

Existing View

This busy regional road connects Naas and Blessington and runs within 300m west of the Site. Along this section of road, there are upwards of eight residences. Most of these are on the western side of the road, with easterly views in the broader direction of the site, albeit often full or partially screened by roadside vegetation.

Partially screened by roadside vegetation, this view looks eastward across the road, to the undulating pastureland that includes the western edge of the Site that runs southwest to the edges of Deerpark forest. However, the Site's quarry workings are not visible. The partially screened mid-ground field contains the stone ruins of a historic icehouse, as well as numerous relatively low trees scattered about the undulating pasture. It is worth observing that the roadside hedgerow is in a robust state of regrowth. Thus, it is fair to assume that for several months of the year, views beyond the roadside, in the direction of the site, are only attainable from field entrances.

The viewpoint sensitivity is **Medium-Low**, as the view is representative of local community views and major routes.

Visual Effects following completion of Phase 3

Upon completion of Phase 3 of the proposed development, some elements of the scheme will be visible. Beyond the undulating mid-ground field, the pre-existing treeline (in the west of the site) will have been felled and above a recently constructed berm, the upper 'lip' of the proposed quarry face will be discernible. This 'lip' will flow with the contours of the surrounding landform but will nonetheless demarcate a small section of the new skyline. To the left/north of the aforementioned icehouse, no visual change to the baseline is likely.

The loss of the treeline on the skyline will marginally detract from the visual amenity of this view, when combined with the 'foreshortening' of that skyline by at least 150m (i.e. from this viewpoint, the skyline at this location has moved approx. 150m westwards, in the direction of this viewpoint). However, while the lip of the proposed quarry extension will now define a small section of the skyline at this location, it is consistent with the undulating sweep of surrounding/pre-existing terrain. In addition, this quarry lip is tangibly connected to, and consistent with, the quarry materials evident elsewhere in this scene. As a result of these factors, the magnitude of visual impact is deemed to be **Low**.

Residual Visual Effects (i.e. post-mitigation)

The former aforementioned treeline on the small section of skyline will be replaced with that of another. However, this new skyline will 'foreshorten' the skyline in this location, which signifies a fractional loss in visual amenity, when compared to the base line, although this will be partially offset by the creation of a more aesthetic treeline along the berm. On balance, the magnitude of visual impact is deemed to be **Low-negligible**.

The significance of change will be **Slight** up until the completion of Phase 3, thereafter reducing to **Not Significant** in the long term.

Qualitatively the effect will be **Adverse/Negative.**

Viewpoint 13 - Residences along short *cul de sac* at Wolfestone townland

Existing View

This viewpoint is located at the end of a short *cul de sac* near the northwest corner of the site boundary, where it enters into the Site. The short *cul de sac* road is located off the R410 Naas-Blessington Road and has four rural residences along it, with two residences located within 50m of this viewpoint. However, this view is contained by the high hedgerow along the site's western boundary. A gate marks the entrance to the Site, with a rough agricultural-style track leading into the site's pastoral lands. Upon the distant skyline, a mature tree-lined field boundary is apparent. However, the Site's existing active quarry workings are not visible from this location.

The viewpoint sensitivity is **Medium-Low**, as the view is representative of local community views.

Visual Effects

The proposed development will not be visible from this point, due to screening by intervening vegetation and/or landform. Thus, it will have no visual effect on this viewpoint.

The magnitude of change will be **None.**

The significance of change will be **No Change** in the Short, Medium and Long Term.

Qualitatively the effect will be **N/A.**

11.6.2.3 Summary of Visual Effects

The visual effects are summarised in Table 11-9, below.

Table 11-9 – Viewpoint Locations and summary of effects

Viewpoint Number	Viewpoint Description	Sensitivity	Magnitude of Change	Significance and Qualitatively
1	Elevated local road at Kilbride townland	Medium-Low	None	No Change
2	Designated Wicklow County "Prospect" overlooking Poulaphouca Reservoir	Medium	None	No Change
3	Designated Wicklow County "Prospect" at Baltyboys along the R758	Medium	None	No Change
4	Ring road along northern periphery of Blessington Town	Low	None	No Change
5	Elevated third class road southwest of site, at Newtownpark townland	Medium-Low	Negligible	Imperceptible & Neutral
6	R410 west of site, at Athgarrett townland	Medium-Low	Low (post-Phase 3) Low-negligible (post-Phase 4)	Slight, Imperceptible & Adverse/negative
7	R410 northwest of site near Carter's Hill	Medium-Low	Negligible	Imperceptible & Neutral
8	Third class road at Baysland townland	Medium-Low	None	No Change
9	County Kildare scenic route, near Kilteel village	Medium	None	No Change
10	Dead-end third class road east/north-east of site	Medium-Low	Negligible	Imperceptible & Neutral
11	County Kildare scenic route, at Greenmount townland	Medium	Negligible	Imperceptible & Neutral
12	Residences along the R410, southwest of site	Medium-Low	Low (post-Phase 3) Low-negligible (post-Phase 4)	Slight, Not Significant & adverse/negative
13	Residences along short *cul de sac* at Wolfestone townland	Medium-Low	None	No Change

Thus, in summary, visual effects associated with the proposed development will be **Not Significant.**

11.7 MITIGATION MEASURES

The proposed Mitigation Measures are addressed in this section, which are listed between operational stage and restoration stage mitigation measures.

11.7.1 OPERATIONAL STAGE

Mitigation measures include:

- Clearance of the existing agricultural land and field hedgerow boundaries within the site will occur on a phased basis as areas A to E of the quarry are made available to be worked out.
- Soils and overburden stripped will be used in the creation of screening berms along the perimeter of the proposed development. Perimeter bunds will be 2 m high and 8 m wide and seeded to help reduce the likely visual impact of the proposed development.
- Existing hedgerows will be remediated by the planting of additional native species which will help to fill out any gaps and provide further screening of the quarry, as these hedgerows thicken out overtime.
- Protection of existing water bodies including establishing a buffer area around the existing pond/surface water body located to the north of the main extraction area and east of the northern lateral extension and planted up with a proposed 3-5 m wide wet woodland mix of native willow and alder species.
- Annual review/management of the new boundary planting to ensure that it becomes established and provides adequate visual screening, with generic improvements and spot fixes (including supplementary planting or thinning) to be implemented where required.

11.7.2 RESTORATION STAGE

The proposed restoration measures will seek to reinstate some of the lands to a suitable agricultural use upon cessation of works, while also providing a net ecological gain by habitat creation and use of native planting species throughout the site. These measures are outlined in the Restoration Plan, within Appendix 11-A and will be implemented at the cessation of all works across the site, with all details to be agreed in advance with KCC.

- The Restoration Plan outlines additional measures to assist in assimilating the Proposed Development into the landscape and enhancing vegetation cover and biodiversity to offset the effects of vegetation and habitat loss.
- New habitat provision under the Restoration Plan will include provisions for native trees, hedgerow, shrub planting and wildflower meadow grassland along with the provision of bird/bat boxes and invertebrate housing over and above the current situation. Species assemblages to be agreed with Kildare County Council.
- The landscape mitigation measures will seek to provide additional visual screening of the site from visual receptors.

Mitigation measures include:

- The existing soils of the screen berms and the extracted outcrop waste material will be reused across the site to regrade the worked lands quarry floor and provide a suitable growing media for the proposed planting. Evidence of the former quarry will remain in the form of some exposed rock faces and sand and gravel faces, which are left to provide ecological benefits in the form of nesting sites.
- The proposed planting will include a mix of native meadow grasses and wildflowers, shrubs and trees species, which are typical of planting mixes found within the field hedgerows, woods and alongside waterbodies across the local area. These mixes are identified on the Restoration Plan and include the likes of hawthorn and blackthorn mix for the hedgerows, and deciduous trees of oak, alder and birch within proposed woodland. Specific species assemblages will be agreed with Kildare County Council. The proposed planting will help re-establish field patterns previously lost to the Site's former large void and will bring about numerous ecological benefits in the form of new habitat creation, ecological corridors and rich food sources. The Site's northern end lands will be reinstated to agricultural grasslands returning this part of the site to pasture.
- The new planting will be maintained for a minimum period of 3 years as part of the initial landscape contract to ensure the planting becomes established and that any planting which fails in this period is replaced with similar by the landscape contractor.
- Over time, the Site Management will include periodic inspection and maintenance of the boundary planting to ensure its effectiveness as a visual screen and in forming dense field boundary edges. The grassland/meadow areas will likewise be continually managed, as a part of a grazing or mowing regime.
- Management/Improvement of the retained site boundary hedgerows and trees: The existing Site boundary hedgerows and trees to be surveyed and appraised in terms of (a) species mix - for biodiversity and maximum screening (height, density of foliage), and (b) intactness/continuity. Generic improvements and spot planting to be made where required to optimise the health of the hedgerows, their biodiversity value and visual screening function.
- The majority of the site will be restored to improved agricultural grassland and native grassland meadows in keeping with the wider agricultural land use in the locality.
- At the centre of the site, a new waterbody will be established, with marginal and wet woodland native planting alongside it.
- In the northeast of the site, the existing waterbody will be retained, and enhanced with wetland marginal and woodland planting. This area will ultimately be covered by water as the quarry fills to its natural level (determined by the water table), forming a permanent lake. The shallow areas will provide suitable substrate for aquatic invertebrates, with gentle grading of shoreline and marginal planting added (to be determined at the time, with the advice of an ecologist).
- In the west of the site, near-vertical banks along sand and gravel faces will create suitable Sand Martin sites. Rockfaces and benches will create areas for natural colonization aided with some strategic planting to provide for an optimum ecological habitat.
- Enhancement of existing boundary screening with native vegetation is proposed and 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. Any gaps in the boundary vegetation are to be planted with native hedgerows.

- Quarry benches: At a number of locations (to be determined at the time, with the advice of an ecologist) a mixture of trees and shrub species will be planted in an engineered substrate to form patches of habitat. This will create a platform for a more diverse flora to develop naturally and provide habitat and food resources for birds, mammals, insects and other invertebrates.
- Quarry faces: Whilst recognising the geological value of the exposed quarry faces, it is proposed that some native tree and shrub species be planted in/on fissures and ledges, to help break up the bare profile of the rock face (the southern quarry face in particular.) Other plant species will be allowed to find and colonise the area by natural means, and these will include various mosses, lichens, algae, ferns, flowering plants, etc. The gradually increasing native plant diversity will, over time, ensure that a correspondingly diverse list of animal species (birds, mammals, butterflies and other insects, other invertebrates, etc.), can become established.
- Safety measures: An agricultural fence to be installed around the edge of the excavation, to act as a visual indicator of the edge and a physical barrier for people and animals. Safety signs are also proposed to be erected on and outside the boundary fence. In addition, similar fencing will be constructed around all water bodies, with appropriate safety signs.

11.8 RESIDUAL EFFECTS

The residual effects are those as described by EPA EIAR guidance as "*The degree of environmental change that will occur after the proposed mitigation measures have taken effect.*"

Landscape Effects:

The residual landscape effects are as described and assessed in the above landscape assessment. Consequently, there are no significant residual landscape effects.

Visual Effects:

The residual visual effects are as described and assessed in the above visual assessment. Consequently, there are no significant residual visual effects.

11.9 CUMULATIVE EFFECTS

The main cumulative impacts that are likely to arise from the proposed development are those derived from the proximity and scale of the existing Hudson Bros. Ltd. quarry. However, the proposed development is a measured but sizeable extension of the existing pit. When taken in the context of the presence of multiple quarrying activities within 1-2 km of the site, the proposed development represents a minor intensification of an existing land use.

Consequently, the proposed development is not considered to give rise to any significant cumulative impacts.

11.10 DIFFICULTIES ENCOUNTERED

The visual assessment was structured upon viewpoints from surrounding public roads, which meant that it was not always possible to assert a residential receptor's exact views towards the existing site (i.e.as the exact residential receptors/homes are on private property, rather than in the public domain).

Where this occurred, professional judgement was used, in keeping with best practice, to describe the likely visual effects from such receptors. However, this is quite standard during the LVIA process.

In addition, as part of the Site is a working quarry, it is not possible to safely access its full extent. However, full visibility into the quarry was established at all times, during the site visit. However, this is quite standard for the LVIA process when the site in question is that of a quarry and/or quarry extension.

11.11 SUMMARY AND CONCLUSIONS

Landscape

The Site is located within an area of modified landscape in the form of established quarrying activity and existing farmed pastureland on the Kildare/Wicklow County border. In terms of landscape impacts, the Site displays a robust set of features that will help to assimilate, absorb and integrate itself into the surrounding landscape of the study area and its documented landscape character.

Quarry projects tend to highlight the difference between landscape impacts and visual impacts more than most other developments. That is, the distinct physical impacts on landform and land cover are not always apparent in changes to prevailing landscape character or visual amenity. The lands subject to this EIAR are ca. 95.8 ha. and encompass an application area of ca. 64.0 ha., represent the continuation and extension of the existing quarry, a traditional and long-established land use for this part of the study area.

Approximately 28 ha of existing pasture, approximately 2.75 km of hedgerows and treelines; approximately 2.7 ha of dry meadows and grassy verges and approximately 0.19 ha of scrub will be removed as a result of the proposed pit extension. However, as part of the restoration plan, it is proposed to plant c. 2.88km of hedgerows; 4.79 ha of a woodland mix (to serve as a screening buffer along site boundaries); 15.9ha of a Wet Woodland Mix (by the two water bodies and by northeast corner of the site); 890m2 of marginal planting around the two water bodies (in addition to the wet woodland areas); 13.1ha of reinstated agricultural grassland; 23.1 ha of native grassland meadows, as well as 18.16 ha for natural colonization.

Indeed, in this much-modified and ever-evolving landscape, quarrying has traditionally sat alongside pasture, tillage, commercial forestry, and the proposed quarry extension is likely to represent the continuation of that diverse status quo. In spite of this, it cannot be ignored that the Application Site is located within a Kildare County Landscape character Area that is designated as having a "high sensitivity." Furthermore, the proposed development will result in a distinct and permanent alteration to the topography and land cover of the Site. However, landscape and visual mitigation measures are 'embedded' within the proposed development design, and no additional mitigation measures would be likely to discernibly reduce any potentially unfavourable/unwanted landscape or visual impacts associated with this scheme.

On balance, the significance of landscape impact is not considered to be any greater than **Moderate** within the immediate context of the Site, and not considered to be any greater than **Not Significant** across the wider study area, as the proposed development becomes a comparatively smaller component of the overall landscape fabric.

In terms of the Restoration Stage, the significance of landscape effects is not considered to be any greater than **Moderate-slight** within the immediate context of the Site. This is likely to reduce rapidly to **Imperceptible** within the wider study area, with increasing distance from the site.

Visual

In terms of **visual impacts**, it ought to be remembered that any quarrying operation has the potential to be a conspicuous and severe element in any landscape: while some people will perceive it as an economic gain for the local community, others can concurrently perceive it as devaluing, degrading or scaring that landscape. On balance, such perspectives are influenced by the precedence, scale, shape and duration of the proposal, and how it may complement or contrast with its immediate surroundings, as well as how the impact of proximity to local/neighbouring properties or roads can be a major determinant in shaping such perspectives.

13 No. visual receptors/viewpoints were selected for the above Visual Impact Assessment, from a range of viewing angles, distances and contexts. All of these viewpoints were from the public realm, between Co. Wicklow and Co. Kildare, and covered a range of visual sensitivities. However, the assessment established that the proposed development will be largely obscured from most receptors by either intervening landform or vegetation, and that the range of potential residual visible impacts that are likely to be generated as a result of the proposed development is notably low.

An analysis of 13 selected Viewshed Reference Points within the study area varied from **'No Change'** (in 7 out of the 13 locations) to **'Imperceptible'** (in 5 out of the 13 locations) to **'Not Significant'** (in 1 out of the 13 locations). This is a distinctively low range of likely visual impacts for most proposed developments, even more so for an open cast quarry.

Conclusion

As determined within this assessment, the proposed development will not result in any significant landscape or visual effects.

11.12 REFERENCES

- Kildare County Council (2022) Kildare County Development Plans 2022-2028 https://kildarecoco.ie/AllServices/Planning/DevelopmentPlans/
- Wicklow County Council (2022) Wicklow County Development Plans 2022-2028 & 2016-2022 https://www.wicklow.ie/Living/Services/Planning/Development-Plans-Strategies/National-Regional-County-Plans/Wicklow-County-Development-Plan
- Kildare County Council Planning Enquiry (Online Search Facility) https://kildarecoco.ie/AllServices/OnlineServices/OnlinePlanningEnquiries/
- Wicklow County Council Planning Enquiry (Online Search Facility)
- https://www.wicklow.ie/Living/Services/Planning/Planning-Applications/Online-Planning
- Department of Housing, Local Government and Heritage (DHLGH) (2021) *National Land scape Strategy 2014-2025* Dublin: DHLGH. https://www.gov.ie/en/publication/8a59b-national-landscape-strategy/
- Department of the Environment, Heritage and Local Government (April 2004) *Quarries and Ancillary Activities- Guidelines for Planning Authorities.* Dublin: https://www.gov.ie/en/publication/a61d3-quarries-and-ancillary-activities/
- Environmental Protection Agency (EPA) (2022). *Guidelines on the Information to be Contained in Environmental Impact Reports (EIAR).* Environmental Protection Agency, Wexford. https://www.epa.ie/publications/monitoring--assessment/assessment/guidelines-on-the-information-to-be-contained-in-environmental-impact-assessment-reports-eiar.php
- Landscape Institute and the Institute of Environmental Management and Assessment (2013) *Guidelines for Landscape and Visual Impact Assessment*, 3rd edition, London: Routledge.
- Landscape Institute (2015) *GLVIA3 – Statements of clarification*, London: Landscape Institute. https://www.landscapeinstitute.org/technical-resource/glvia3-clarifications/
- Landscape Institute (2019) *Visualisation of development*, London: Landscape Institute. https://www.landscapeinstitute.org/visualisation/

Appendix 11A

RESTORATION PLAN

LEGEND

- APPLICATION SITE BOUNDARY
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING RETAINED HEDGEROWS SUPPLEMENTED BY INFILL PLANTING AS REQUIRED WITHIN SITE
- NOTABLE BLOCKS OF MATURE HEDGE AND WOODS NEXT TO SITE
- EXISTING GAS PIPELINE AND BUFFER ZONE (15m)
- EXISTING AGRICULTURAL LANDS WITHIN THE LANDOWNER BOUNDARY BUT OUTSIDE OF QUARRY'S RESTORED AREA
- PROPOSED HEDGEROW
- NEW WOODLAND FRAMEWORK FOR SCREENING AND HABITAT ENHANCEMENT
- LANDOWNER BOUNDARY
- AREAS AROUND ROCK FACE FOR NATURAL COLONIZATION
- AREAS FOR REGENERATION AROUND WATER BODIES
- WATER BODIES BUFFER MARGINAL EDGE PLANTING
- WATER BODY
- SAND MARTIN BANKS
- AREAS AROUND QUARRY FOR NATURAL COLONIZATION
- AREAS REINSTATED TO AGRICULTURAL GRASSLAND
- AREAS ACROSS QUARRY FLOOR REINSTATED TO NATIVE GRASSLAND MEADOW
- TIMBER POST AND WIRE FENCING
- BIRD BOX (x5 no.) (indicative location)
- BAT BOX (x5no.) (indicative location)
- INVERTEBRATE HOUSING (x5no.) (indicative location)
- ACCESS ROUTE

PLANTING SCHEDULE

Woodland Mix - Boundary Screening Buffer
To include species from the following

Trees - 0.6-0.9m ht. - min 2-3m. ctrs	Understorey Shrubs - 60-90cm ht., in random groups of 5-15 no at min 1.5-2m c/cs
Alnus glutinosa - 10% *Betula pubescens* - 10% *Corylus avellana* - 5% *Euonymus europaeus* - 3% *Pinus Sylvestris* -15% *Prunus padus* - 2% *Quercus petrea* - 20% *Sorbus aucuparia* - 5%	*Crataegus monogyna* -10% *Prunus spinosa* - 5% *Ilex aquifolium* - 5% *Rosa canina* - 2% *Viburnum opulus* - 3% *Salix aurita* - 5%

Wet Woodland Mix - Next to Ponds
To include species from the following

Trees - 0.6-0.9m ht. - planted at min 3m ctrs	Marginal Planting - CG P9 & 2L, in random groups of 5-7 no at 4/sq.m
Alnus glutinosa - 40% *Salix alba* - 25% *Salix cinera* - 25% *Salix caprea* - 10%	*Iris pseudacorus*, 20% *Juncus effusus*, 20% *Juncus acriculatus*, 20% *Carsamine pratensis*, 10% *Filipendula ulmaria*, 10% *Caltha palustris*, 10% *Potentilla palustris*, 10%

Hedgerow Planting
- Along lengths of the new hedgerows and as infill to gaps within existing hedges.

Hedgerow Trees - br 120-150cm ht. Planted individually at approx. 10-15m c/cs through the hedges	Hedge - br 60-90cm ht., planted in random groups of 5-15 at 5/lin. m and double staggered
Malus sylvestris - 20% *Pinus Sylvestris* -10% *Quercus petrea* - 50% *Sorbus aucuparia* - 20%	*Corylus avellana* - Hazel - 10% *Crataegus monogyna* - Hawthorn - 45% *Euonymus europaeus* - Spindle - 5% *Ilex aquifolium* - Holly - 3% *Ligustrum vulgare* - Privet- 10% *Prunus spinosa* - Blackthorn - 15% *Rosa canina* - Dog Rose - 2% *Viburnum opulus* - Guelder Rose- 10%

Meadow & Agricultural Grassland Mixes:
Areas of grassland sown across the quarry floor over an added topsoil layer of 0.3m depth. Selected Native Meadow Grassland mix to contain pollinator friendly rich native wildflowers species which flower at various times. Source of seed mix from an approved Irish grown supplier. e.g. Design By Nature MM12 Wild Flora for Raw improvised sub soil mix with a suitable grass nursery crop of bent and fescue grass species. Agricultural Mix of a suitable grassland cover similar to that within the surrounding fields.

Note: Species assemblages to be agreed with Kildare County Council

REV	DATE	AMENDMENT
B	23/02/2024	UPDATE LAYOUT
A	22/02/2024	UPDATE LAYOUT AND LEGEND

CUNNANE STRATTON REYNOLDS
LAND PLANNING & DESIGN

DUBLIN OFFICE
3 MOLESWORTH PLACE DUBLIN 2
TEL 01 661 0419 FAX 01 661 0431
EMAIL info@csrlandplan.ie

N

PROJECT: HUDSON BROTHERS LTD SECTION 37L APPLICATION CO. KILDARE	DATE: FEBRUARY 2024
	SCALE: 1:2000 @ A1
DRAWING: APPENDIX 11-A RESTORATION PLAN	DRAWN: RF CHECKED: JB
	DRAWING NO: 23386-2-101

Appendix 11B

VERIFIED PHOTOMONTAGES

Public

macroworks

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APEM Group

APPENDIX 11B VERIFIED PHOTOMONTAGES

Hudson Brothers Limited, Section 37L Application,
Co. Kildare

This book contains imagery for the
viewpoints chosen for the LVIA study

February 2024

LVIA I TVIA I Landscape Design I Visibility Analysis I Glint and Glare I Verified Photomontages I CGI I Shadow Flicker Analysis

INC

Viewpoint 1 - Existing View*

Viewpoint 2 - Existing View*

Viewpoint 3 - Existing View*

Viewpoint 4 - Existing View*

Viewpoint 5 - Existing View + Montage View
Viewpoint 5 - Montage View + Mitigated View

Viewpoint 6 - Existing View + Montage View
Viewpoint 6 - Montage View + Mitigated View

Viewpoint 7 - Existing View + Montage View
Viewpoint 7 - Montage View + Mitigated View

Viewpoint 8 - Existing View*

Viewpoint 9 - Existing View*

Viewpoint 10 - Existing View*

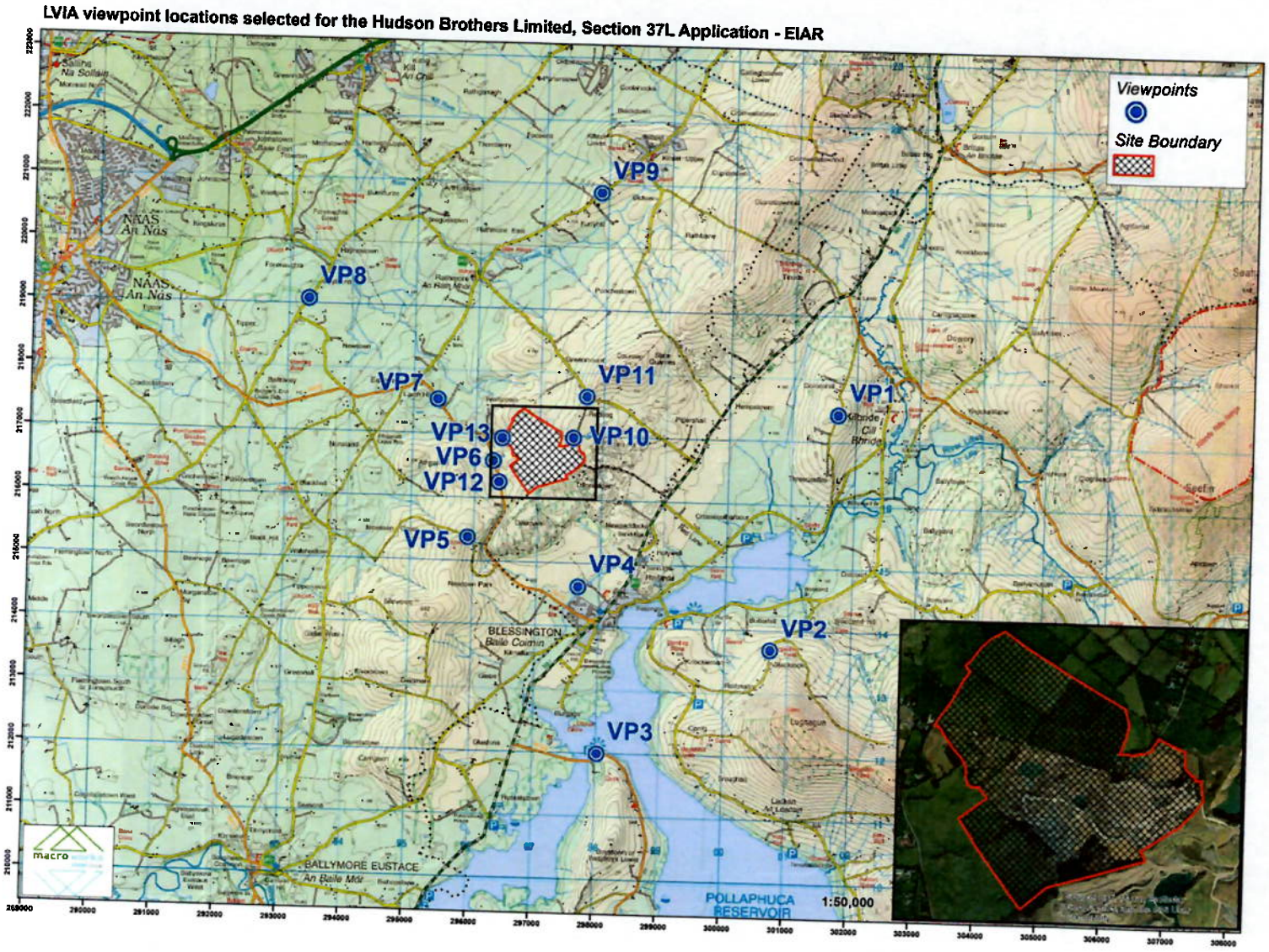
Viewpoint 11 - Existing View + Outline View
Viewpoint 11 - Montage View + Mitigated View

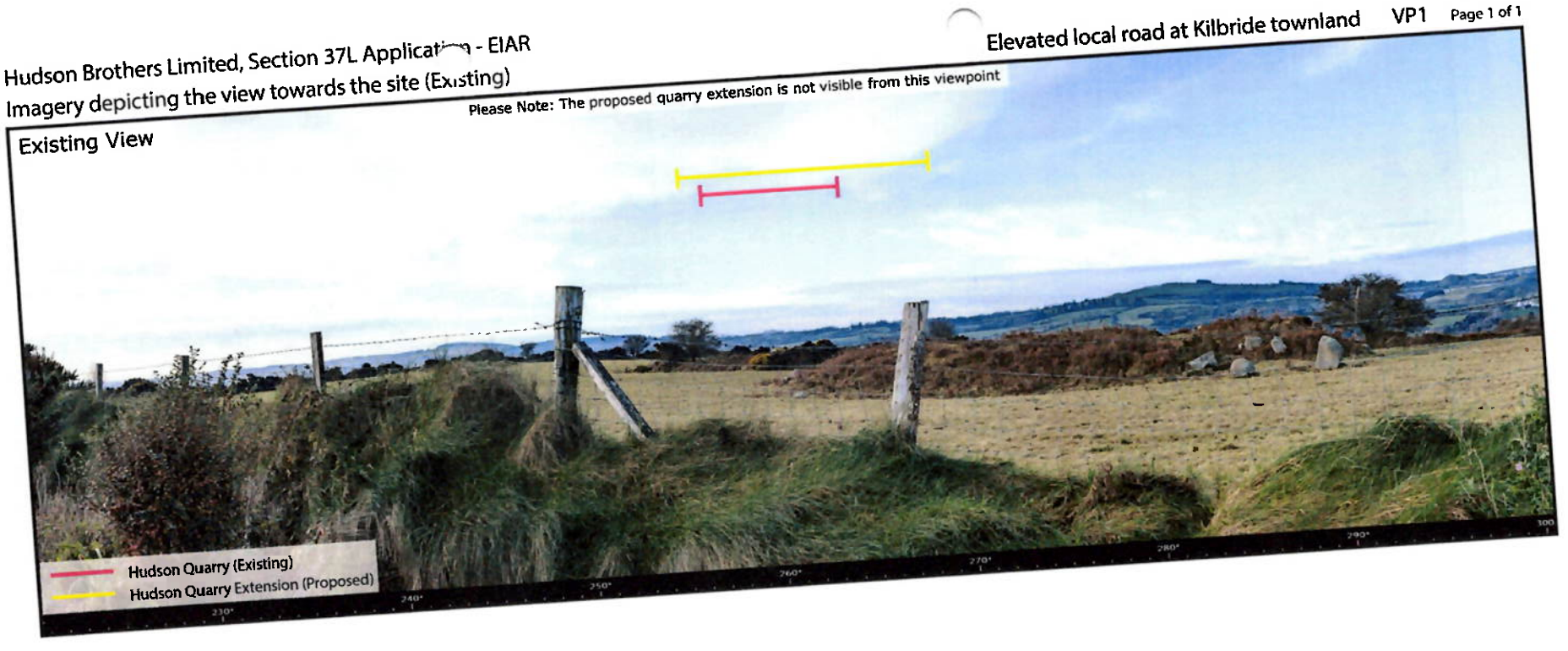
Viewpoint 12 - Existing View + Outline View
Viewpoint 12 - Montage View + Mitigated View

Viewpoint 13 - Existing View + Outline View
Viewpoint 13 - Montage View + Mitigated View

* There is no Montage or Mitigated Montage for this viewpoint

LVIA viewpoint locations selected for the Hudson Brothers Limited, Section 37L Application - EIAR





These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	701639	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	717468	Camera:	Canon 1-D Mark II digital SLR	Time:	13:33
Direction of View	100° W of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

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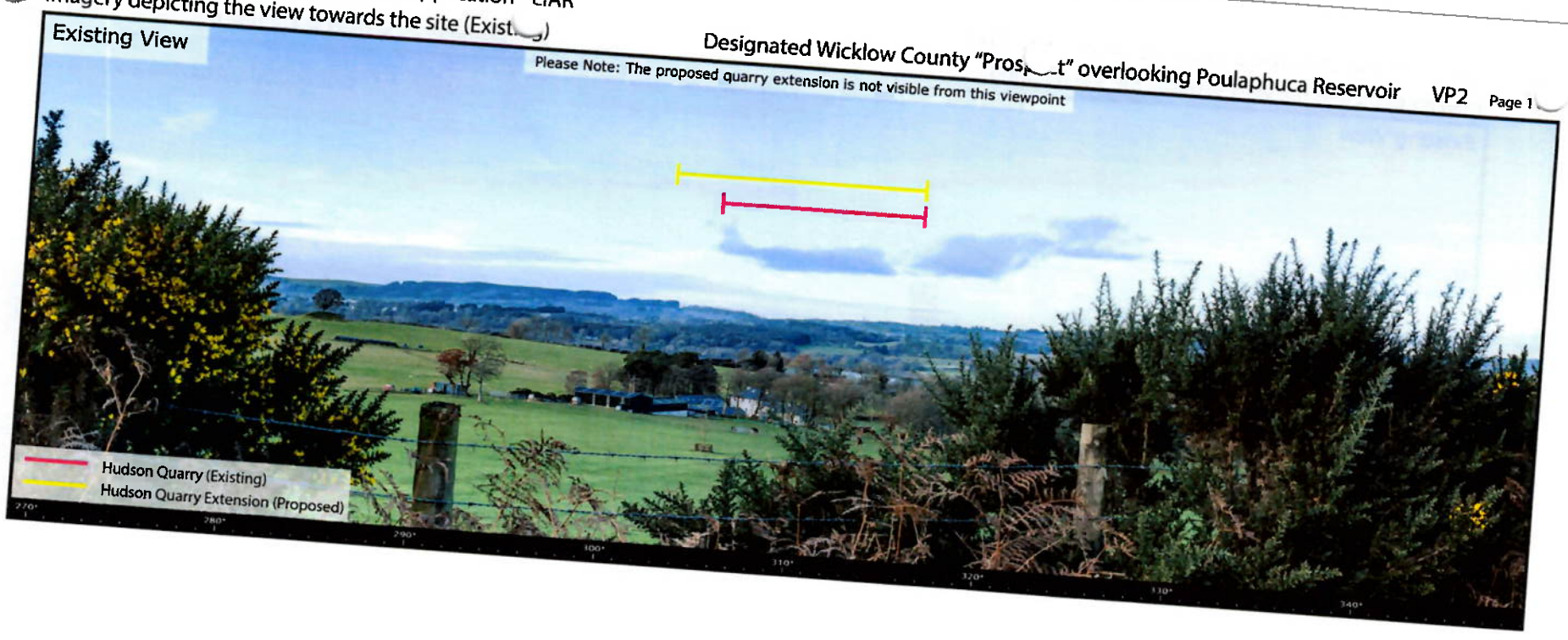
Imagery depicting the view towards the site (Exist...g)



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To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	700649	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	713728	Camera:	Canon 1-D Mark II digital SLR	Time:	13:56
Direction of View	51° W of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

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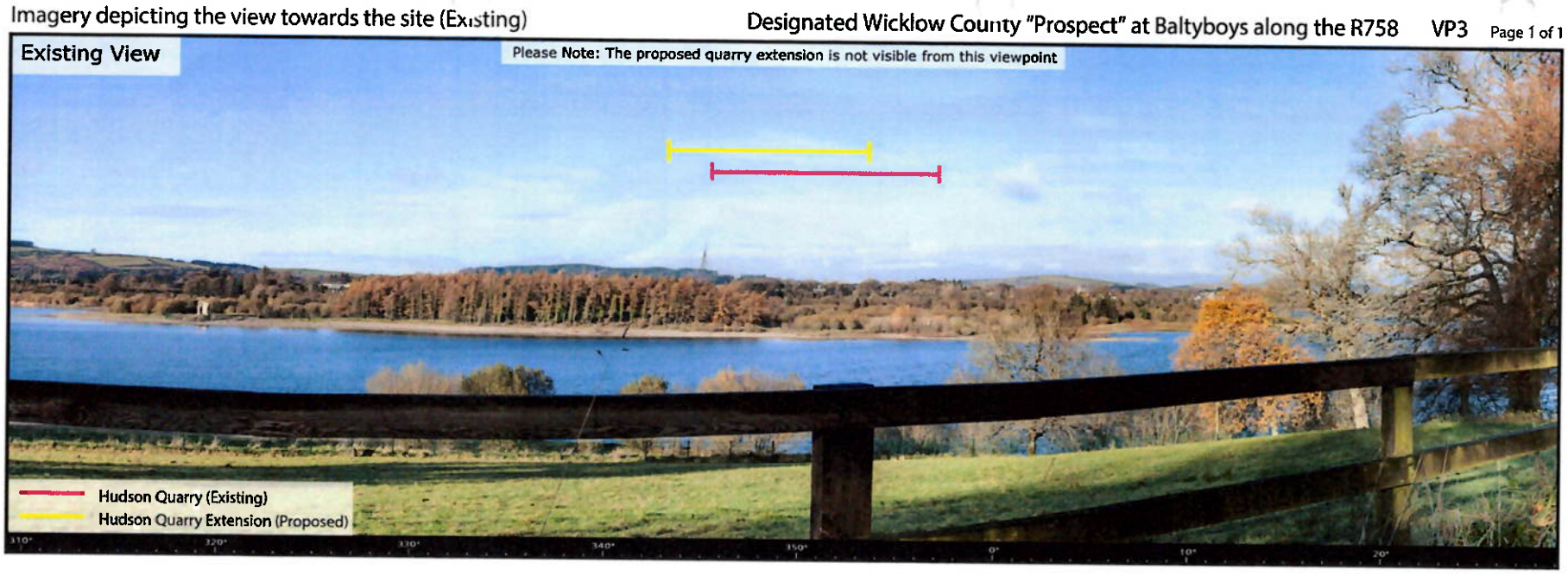
Designated Wicklow County "Prospect" at Baltyboys along the R758 VP3



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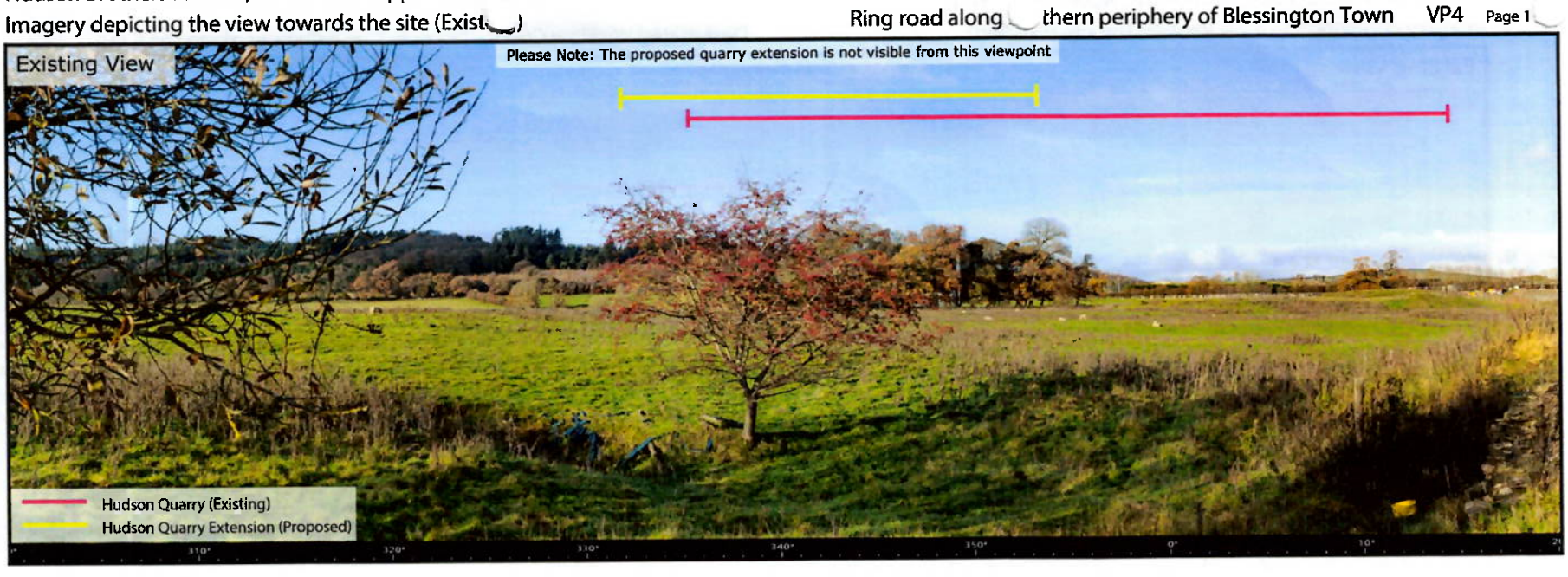
Easting (ITM):	697955	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	712023	Camera:	Canon 1-D Mark II digital SLR	Time:	14:52
Direction of View	16° W of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

macroworks

Imagery depicting the view towards the site (Exist[illegible])

Ring road along [illegible]thern periphery of Blessington Town VP4



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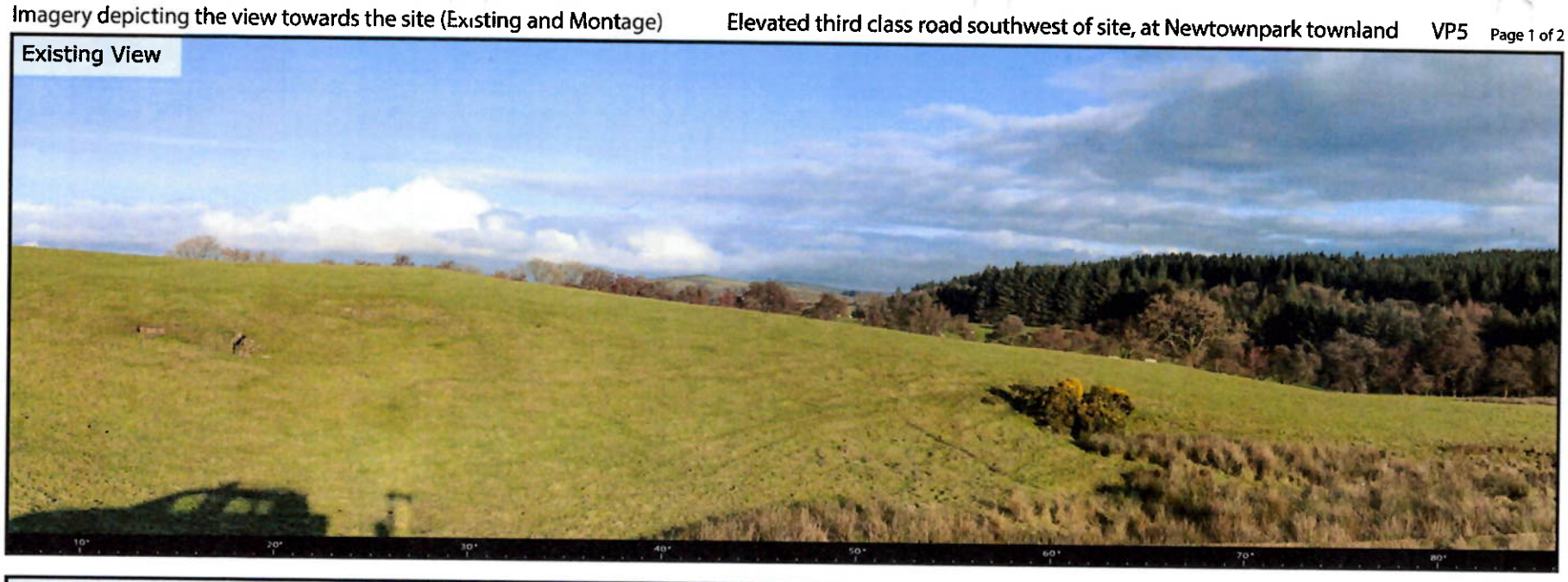
To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	697599	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	714662	Camera:	Canon 1-D Mark II digital SLR	Time:	15:06
Direction of View	20° W of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

macroworks

Elevated third class road southwest of site, at Newtownpark townland VP5



These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	695837	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	715403	Camera:	Canon 1-D Mark II digital SLR	Time:	15:15
Direction of View	43° E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

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To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°

Easting (ITM):	695837	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	715403	Camera:	Canon 1-D Mark II digital SLR	Time:	15:15
Direction of View	43° E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

macroworks

ıgery depicting the view towards the site (Existing and Montage)

R410 west of site, at Athgarrett townl. VP6

Existing View

Montage View

indicating upon completion of Phase 1

These are 120° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 80°

Easting (ITM):	696214	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	716616	Camera:	Canon 1-D Mark II digital SLR	Time:	15:33
Direction of View	78° E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	120°				

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These are 120° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 80°.

Easting (ITM):	696214	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	716616	Camera:	Canon 1-D Mark II digital SLR	Time:	15:33
Direction of View	78° E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	120°				

macro works

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	695319	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	717563	Camera:	Canon 1-D Mark II digital SLR	Time:	15:55
Direction of View 112°	E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

macroworks

Hudson Brothers Limited, Section 37L Application - EIAR

Imagery depicting the view towards the site (Mitig[illegible]d Montage) [illegible]10 northwest of site near Carter's Hill VP7

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	695319	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	717563	Camera:	Canon 1-D Mark II digital SLR	Time:	15:55
Direction of View 112°	E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

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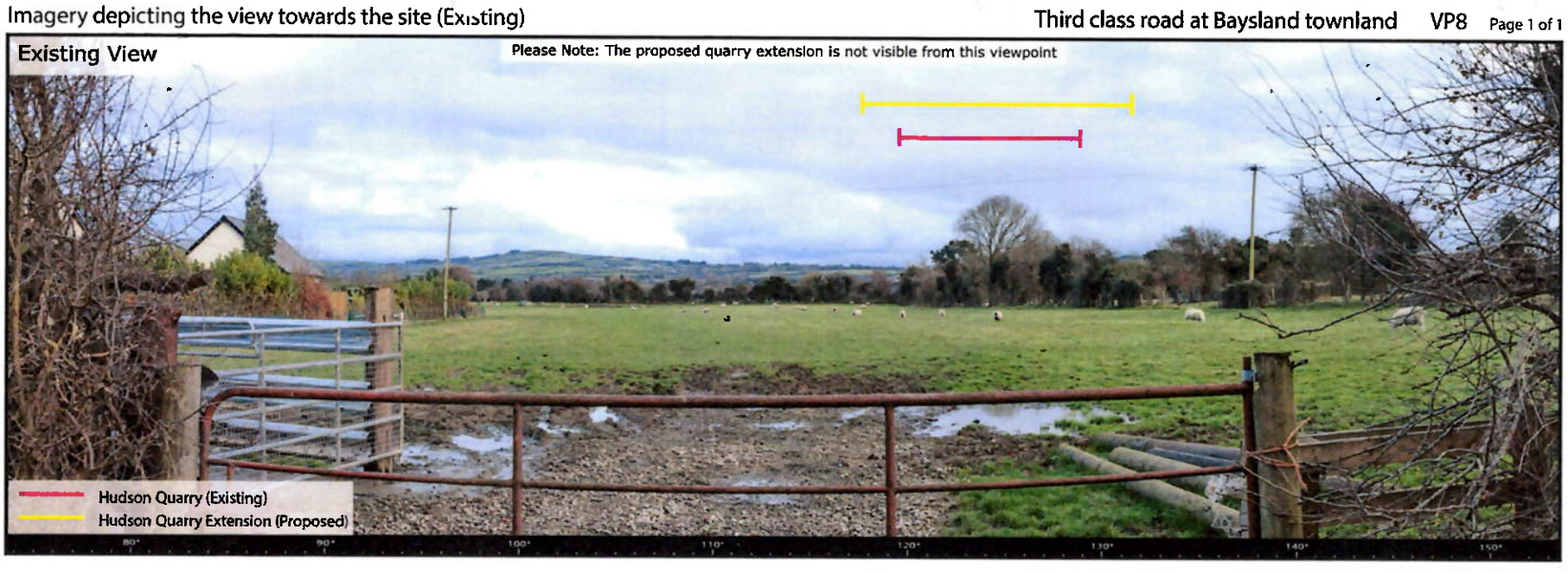

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	693246	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
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Direction of View 114°	E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

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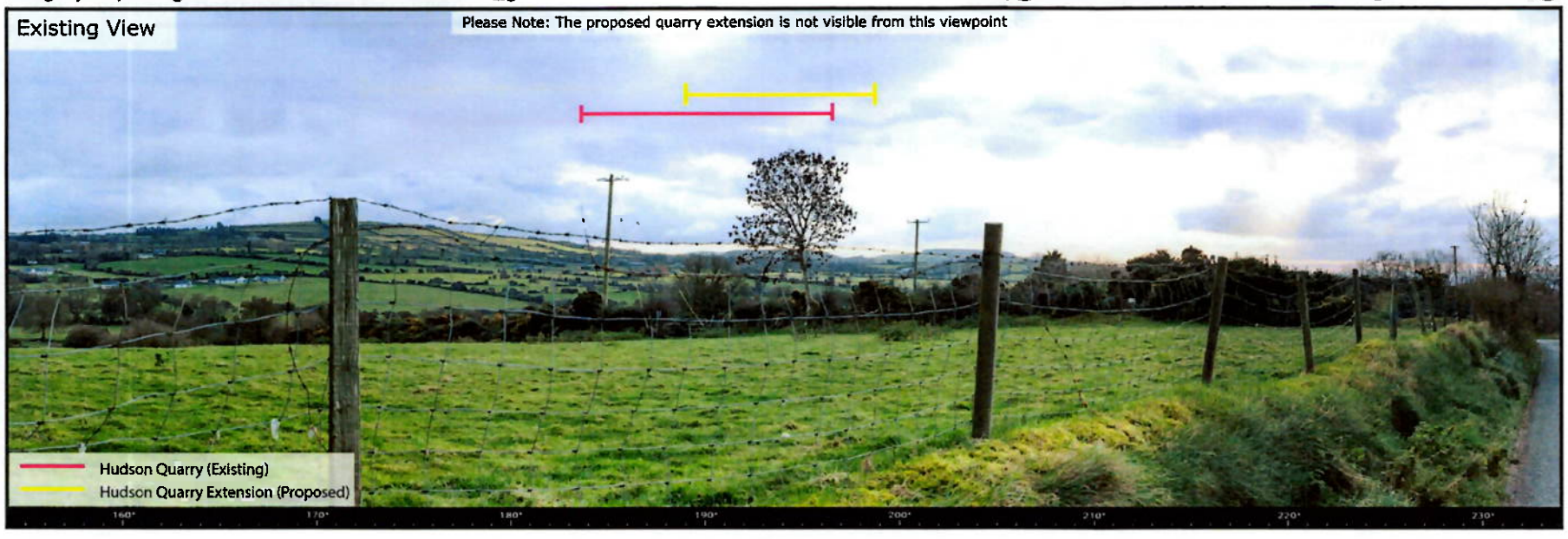

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	697817	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	720890	Camera:	Canon 1-D Mark II digital SLR	Time:	16:18
Direction of View	166° W of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

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Imagery depicting the view towards the site (Existing)

Dead-end third class road east/north-east of site ✓P10

These are 100° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 60°.

Easting (ITM):	697469	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	717007	Camera:	Canon 1-D Mark II digital SLR	Time:	16:37
Direction of View	102° W of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	100°				

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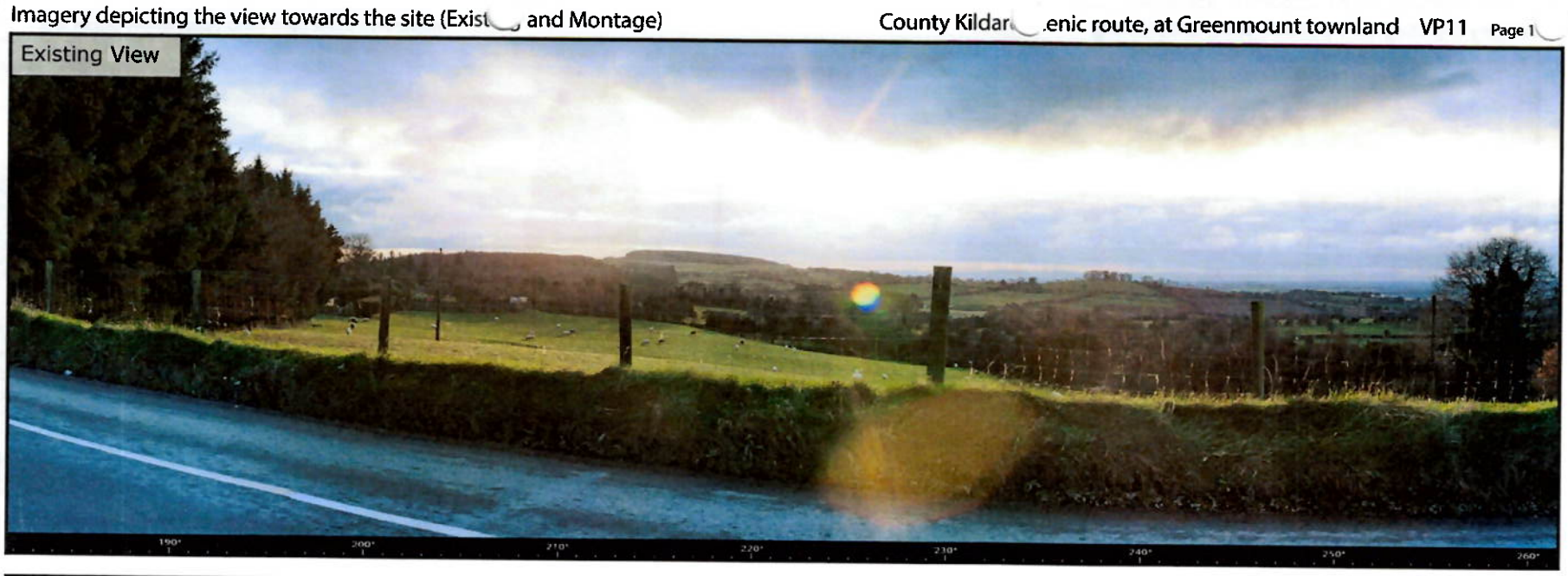
Imagery depicting the view towards the site (Exist and Montage) County Kildar enic route, at Greenmount townland VP11



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Easting (ITM):	697667	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	717658	Camera:	Canon 1-D Mark II digital SLR	Time:	16:30
Direction of View	138° W of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

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Easting (ITM):	697667	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	717658	Camera:	Canon 1-D Mark II digital SLR	Time:	16:30
Direction of View 138° W of Grid North		Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

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Ima depicting the view towards the site (Existing and Montage)

Residences along the R410, southwest of site 212

These are 120° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 80°.

Easting (ITM):	696310	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	716285	Camera:	Canon 1-D Mark II digital SLR	Time:	15:26
Direction of View	58° E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	120°				

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gery depicting the view towards the site (Mitigated Montage)

Residences along the R410, southwest of s VP12

These are 120° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 80°

Easting (ITM):	696310	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	716285	Camera:	Canon 1-D Mark II digital SLR	Time:	15:26
Direction of View	58° E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	120°				

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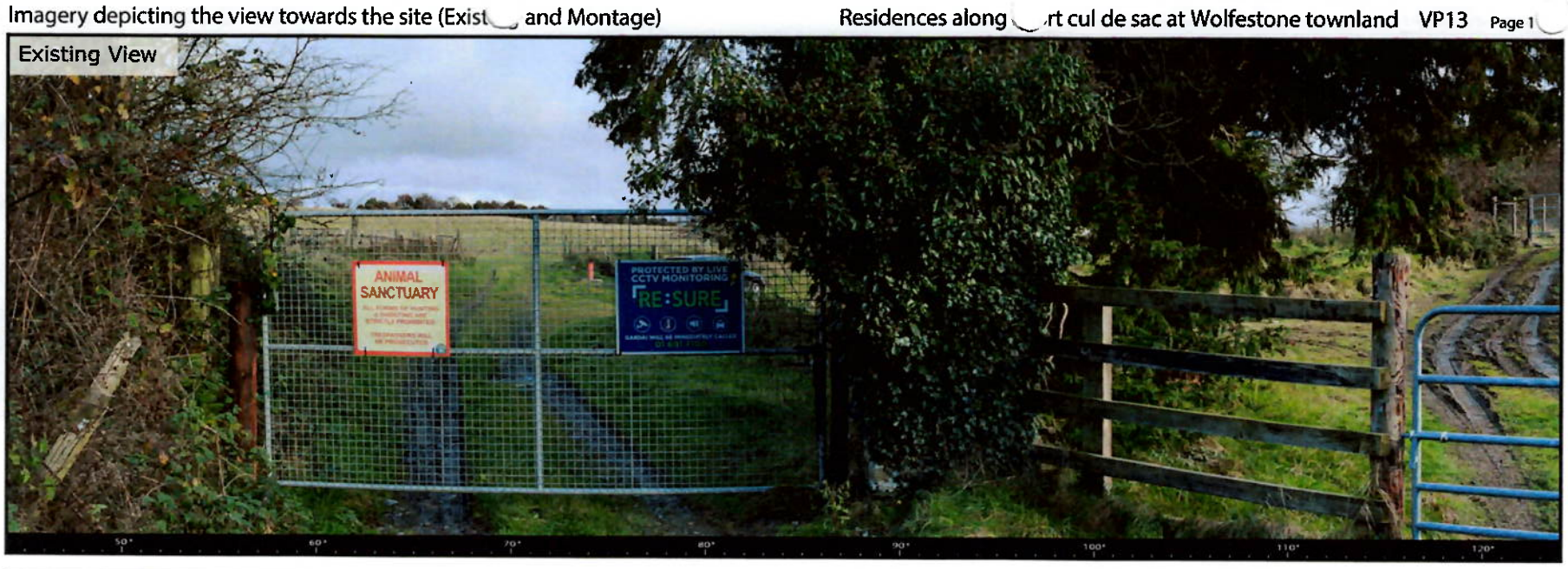

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Easting (ITM):	696347	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	716976	Camera:	Canon 1-D Mark II digital SLR	Time:	15:43
Direction of View	67° E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

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Residences along short cul de sac at Wolfestone townland VP13

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

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Easting (ITM):	696347	Lens:	50mm / Full Frame Sensor	Date:	29/11/2023
Northing (ITM):	716976	Camera:	Canon 1-D Mark II digital SLR	Time:	15:43
Direction of View	67° E of Grid North	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				

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