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## 5 BIODIVERSITY

### 5.1 Introduction

#### 5.1.1 Background

Enviroguide Consulting was retained by Milford Quarries Limited (the Applicant) to prepare a Biodiversity Chapter as part of an Environmental Impact Assessment Report (EIAR) in relation to the potential effects of the Proposed Development at Bannagogle, Old Leighlin, Co. Carlow (hereafter referred to as 'the site').

This Chapter of the EIAR considers the demolition of the derelict buildings and the development of a dimension stone quarry, as described in Chapter 2 (hereinafter referred to as the Proposed Development), in terms of the biodiversity of the site and surrounding environs, with emphasis on habitats, flora, and fauna, and details the methodology of assessment used in each case. It assesses the ecology of the receiving environment for the Proposed Development, assesses and quantifies any potential impacts of the Proposed Development on habitats and species (particularly those protected by national and international legislation or considered to be of conservation importance) and identifies and proposes measures for the avoidance, reduction, and mitigation of these impacts, where appropriate. The results of ecological surveys have been employed to inform the design of the Proposed Development, thereby minimising potential effects on sensitive habitats and Species of Conservation Interest (SCI). A description of residual effects that will remain following the implementation of mitigation is also outlined in this Chapter.

The information provided in this EIAR chapter, accurately and comprehensively describes the baseline ecological environment, and provides an accurate prediction of the likely ecological effects of the Proposed Development.

#### 5.1.2 Quality Assurance and Competence

Synergy Environmental Ltd., T/A Enviroguide Consulting, is wholly Irish Owned multi-disciplinary consultancy specialising in the areas of the Environment, Waste Management and Planning. All our consultants carry scientific or engineering qualifications and have a wealth of experience working within the Environmental Consultancy sectors, having undergone extensive training, and continued professional development. Enviroguide Consulting professional memberships include the Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association and CIEEM.

All surveying and reporting activities have been carried out by qualified and experienced ecologists and environmental consultants.

Dr. Bryan Thompson is an ecologist with Enviroguide Consulting. Bryan has a B.Sc. in Environmental Biology (Hons) and a PhD in Marine Ecology from University College Dublin, and a wealth of experience in desktop research, literature scoping-review and report writing as well as practical field experience (Habitat surveys, intertidal surveys, winter bird surveys, bat surveys, vantage point surveys and fresh water macro-invertebrates). Bryan has

experience in compiling Biodiversity Chapters of EIARs, Appropriate Assessment (AA) screening and Natura Impact Statement (NIS) reports, and in the overall assessment of potential impacts to ecological receptors from a range of developments.

Emma J Devereux, Project Ecologist with Enviroguide, is an experienced ecologist with an extensive breadth of experience in habitat surveying, plant and ecosystem science and research, and environmental sustainability. She completed her PhD in Plant Nutritional Variation and Large Mammal Ecology at Leiden University in the Netherlands, holds an MSc in Environmental Archaeology (Botany) from University College London, an MSc in Environmental Sustainability from University College Dublin, and ecological and environmental research experience at the University of Cambridge, the Nutritional and Isotopic Ecology Lab at the University of Colorado Boulder, and environmental policy experience at the Department of Environment, Food and Rural Affairs (DEFRA), the Office of Electricity and Gas Markets (Ofgem), and various other institutions. She has a wealth of experience in desktop research, literature scoping-review, and report writing, as well as practical field experience (habitat surveys, invasive species surveys and botanical surveys and bat surveys). Additionally, Emma both has experience, and is academically trained, in compiling Biodiversity Chapters of EIARs, full EIARs (including archaeology, natural/cultural heritage, landscape assessment alongside ecology/biodiversity considerations), AA reports and NIS reports, and in the overall assessment of potential impacts to ecological receptors from a range of developments.

Brian McCloskey is an Ecologist and experienced Ornithologist with 11 years of birding experience. Brian holds a degree in Planning and Environmental management from Technological University Dublin. Brian is a longstanding and active member of Bird Watch Ireland and has provided Ornithology survey work for ecological consultancies, e.g., Vantage points surveys of Gulls, Terns, Raptors, Waders, and Wildfowl; hinterland surveys of the above as well as riverine species; and breeding waders and country birds. Brian is highly experienced with all survey methodologies and with surveying all species groups of Irish birds and migrants.

### 5.1.3 Reference to Guidelines Relevant to Discipline

The assessment methodology is based primarily upon the National Road Authority (NRA)'s Guidelines for Assessment of Ecological Impacts of National Road Schemes Rev 2 (NRA, 2009) (referred to hereafter as the NRA Ecological Impact Assessment Guidelines), and the survey methodology is based on the NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009).

In addition, regard was paid to the guidelines listed below in the preparation of this document to provide the scope, structure, and content of the assessment. They are among the recognised guidance in Environmental Impact Assessment and National Road Scheme assessments.

The following guidelines were referenced in the preparation of this chapter:

- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester, UK. CIEEM. (2018).
- Advice Notes for Preparing Environmental Impact Statements (Draft) Environmental Protection Agency. (2015).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports. Published by the Environmental Protection Agency, Ireland. Environmental Protection Agency. (2022).
- Guidelines for Assessment of Ecological Impacts of National Road Schemes. National Roads Schemes (now Transport Infrastructure Ireland), Dublin. NRA. (2009).
- Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (now Transport Infrastructure Ireland), Dublin. NRA. (2010).
- Best practice guidance for habitat survey and mapping. The Heritage Council, Kilkenny. Smith, G.F., O'Donoghue, P., O'Hora, K. and Delaney, E. (2011).
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters. Inland Fisheries Ireland. (2016).

## 5.2 Relevant Legislation

### 5.2.1 National Legislation

#### 5.2.1.1 *Wildlife Act 1976 and amendments*

The Wildlife Act 1976 was enacted to provide protection to birds, animals, and plants in Ireland and to control activities which may have an adverse impact on the conservation of wildlife. With regard to the listed species, it is an offence to disturb, injure or damage their breeding or resting place wherever these occur without an appropriate license from the National Parks and Wildlife Service (NPWS). This list includes all birds along with their nests and eggs. Intentional destruction of an active nest from the building stage up until the chicks have fledged is an offence. This includes the cutting of hedgerows from the 1<sup>st</sup> of March to the 31<sup>st</sup> of August. The act also provides a mechanism to give statutory protection to Natural Heritage Areas (NHAs) and potential Natural Heritage Areas (pNHAs). The Wildlife Amendment Act 2000 widened the scope of the Act to include most species, including the majority of fish and aquatic invertebrate species that were excluded from the 1976 Act.

The current list of plant species protected by Section 21 of the Wildlife Act, 1976 (and amendments) is set out in the Flora (Protection) Order, 2022 (S.I. No. 235/2022). The Flora (Protection) Order affords protection to several species of plant in Ireland, including 89 vascular plants, 40 mosses, 25 liverworts, 2 stonewort and 1 lichen. This Act makes it illegal for anyone to uproot, cut or damage any of the listed plant species and it also forbids anyone from altering, interfering, or damaging their habitats. This protection is not confined to within designated conservation sites and applies wherever the plants are found.

NHAs are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with Special Areas of Conservation (SAC) and/or Special Protection Area (SPA) sites. Although many NHA designations are not yet fully in force under this legislation (referred to as 'proposed NHAs' or pNHAs), they are offered protection from the date they are formerly proposed for designation, under the Wildlife Amendment Act (2000).

### **5.2.1.2 EC (Birds and Natural Habitats) Regulations 2011**

The EU Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive 1992) provides protection to particular species and habitats throughout Europe. The Habitats Directive has been transported into Irish law through the EC (Birds and Natural Habitats) Regulations 2011.

Annex IV of the EU Habitats Directive provides protection to a number of listed species, wherever they occur. Under Regulation 23 of the Habitats Directive, any person who, in regard to the listed species, *"Deliberately captures or kills any specimen of these species in the wild, deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration, deliberately takes or destroys eggs from the wild or damages or destroys a breeding site or resting place of such an animal shall be guilty of an offence."*

### **5.2.1.3 Invasive Species Legislation**

Certain plant species and their hybrids are listed as Invasive Alien Plant Species in Part 1 of the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations 2011* (SI 477 of 2011, as amended). Regulations 49 and 50 of these Regulations include legislative measures to deal with the dispersal and introduction of invasive alien species. Regulation 50 has not yet been commenced. IAS are also addressed by EU Regulation 1143/2014, which seeks to address the problem of invasive alien species in a comprehensive manner to protect native biodiversity and ecosystem services, as well as to minimise and mitigate the human health or economic impacts that these species can have.

In addition, soils and other material containing such invasive plant material, are classified in Part 3 of the Third Schedule as vector materials and are subject to the same strict legal controls.

Failure to comply with the legal requirements set down in this legislation can result in either civil or criminal prosecution, or both, with very severe penalties accruing. Convicted parties under the Act can be fined up to €500,000.00, jailed for up to 3 years, or both.

Extracts from the relevant sections of the regulations are reproduced below.

*"49(2) Save in accordance with a licence granted [by the Department of Arts, Heritage and the Gaeltacht], any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in anyplace [a restricted non-native plant], shall be guilty of an offence.*

49(3) ... it shall be a defence to a charge of committing an offence under paragraph (1) or (2) to prove that the accused took all reasonable steps and exercised all due diligence to avoid committing the offence.

50(1) Save in accordance with a licence, a person shall be guilty of an offence if he or she [...] offers or exposes for sale, transportation, distribution, introduction, or release—

(a) an animal or plant listed in Part 1 or Part 2 of the Third Schedule,

(b) anything from which an animal or plant referred to in subparagraph (a) can be reproduced or propagated, or

(c) a vector material listed in the Third Schedule, in any place in the State specified in the third column of the Third Schedule in relation to such an animal, plant or vector material.”

## 5.2.2 International Legislation

### 5.2.2.1 EU Birds Directive

The Birds Directive constitutes a level of general protection for all wild birds throughout the European Union. Annex I of the Birds Directive includes a total of 194 bird species that are considered rare, vulnerable to habitat changes or in danger of extinction within the European Union. Article 4 establishes that there should be a sustainable management of hunting of listed species, and that any large scale non-selective killing of birds must be outlawed. The Directive requires the designation of SPAs for: listed and rare species, regularly occurring migratory species and for wetlands which attract large numbers of birds. There are 25 Annex I species that regularly occur in Ireland.

### 5.2.2.2 EU Habitats Directive

The Habitats Directive aims to protect some 220 habitats and approximately 1000 species throughout Europe. The habitats and species are listed in the Directives annexes, where Annex I covers habitats and Annex II, IV and V cover species. There are 59 Annex I habitats in Ireland and 33 Annex IV species which require strict protection wherever they occur. The Directive requires the designation of SACs for areas of habitat deemed to be of European interest. The SACs together with the SPAs from the Birds Directive form a network of protected sites called Natura 2000.

### 5.2.2.3 Water Framework Directive (WFD)

The EU WFD 2000/60/EC is an important piece of environmental legislation which aims to protect and improve water quality. It applies to rivers, lakes, groundwater, estuaries, and coastal waters. The WFD was agreed by all individual EU member states in 2000, and its first cycle ran from 2009 – 2015. The Directive runs in 6-year cycles; the second cycle ran from 2016 – 2021, and the current (third) cycle runs from 2022-2027. The aim of the WFD is to prevent any deterioration in the existing status of water quality, including the protection of good and high-water quality status where it exists. The WFD requires member states to manage their water resources on an integrated basis to achieve at least ‘good’ ecological status, through River Basin Management Plans (RBMP), by 2027.

#### **5.2.2.4 Bern and Bonn Convention**

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) was enacted to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was introduced to give protection to migratory species across borders in Europe.

#### **5.2.2.5 Ramsar Convention**

The Ramsar Convention on Wetlands is an intergovernmental treaty signed in Ramsar, Iran, in 1971. The treaty is a commitment for national action and international cooperation for the conservation of wetlands and their resources. In Ireland there are currently 45 Ramsar sites which cover a total area of 66,995 Ha.

#### **5.2.3 Relevant Local Authority Development Plan/Local Area Plan**

The Carlow County Development Plan 2022-2028 is the current statutory Plan for the county, against which planning applications will be considered. It was adopted on 23rd May and came into effect on 4th July 2022, and identifies policies, as well as specific objectives (including zoning), which are intended to achieve proper planning and sustainable development in its functional area. These policies and objectives, as is relevant to the Proposed Development, in particular rural regeneration, plan, and mineral extraction, are outlined in Chapter 3 of this EIAR.

### **5.3 Description of the Proposed Development**

#### **5.3.1 Location**

The site is located 15km south of the village of Old Leighlin and 5km southwest of Leighlinbridge, Co. Carlow. On a more regional scale, the Proposed Development site is situated 17km south of Carlow Town and 22km northeast of Kilkenny City. On a more local scale, the site is located ~1.5km south of the village of Old Leighlin, ~5km southwest of Leighlinbridge and immediately south of the existing Old Leighlin Quarry (Figure 5-1).

The M9 motorway is located to the east of the site with the closest access point being located ~7km to the south at Junction 7. Junction 6 of the M9 motorway at Powerstown is located ~10km to the northeast. The lands surrounding the site are largely agricultural in nature with several residential houses located within a 1km radius. There is an equestrian centre located ~2km to the east. The site lies immediately to the south of an existing limestone bedrock quarry at Bannagagole (Old Leighlin Quarry) which is operated by Kilkenny Limestone Quarries Ltd. Rock extraction, processing, and surplus rock storage is carried out at the existing quarry.

The River Barrow is located 4km to the east of the site, while the Madlin River, a tributary of the Barrow runs in a west to east direction 1.5km north of the site.

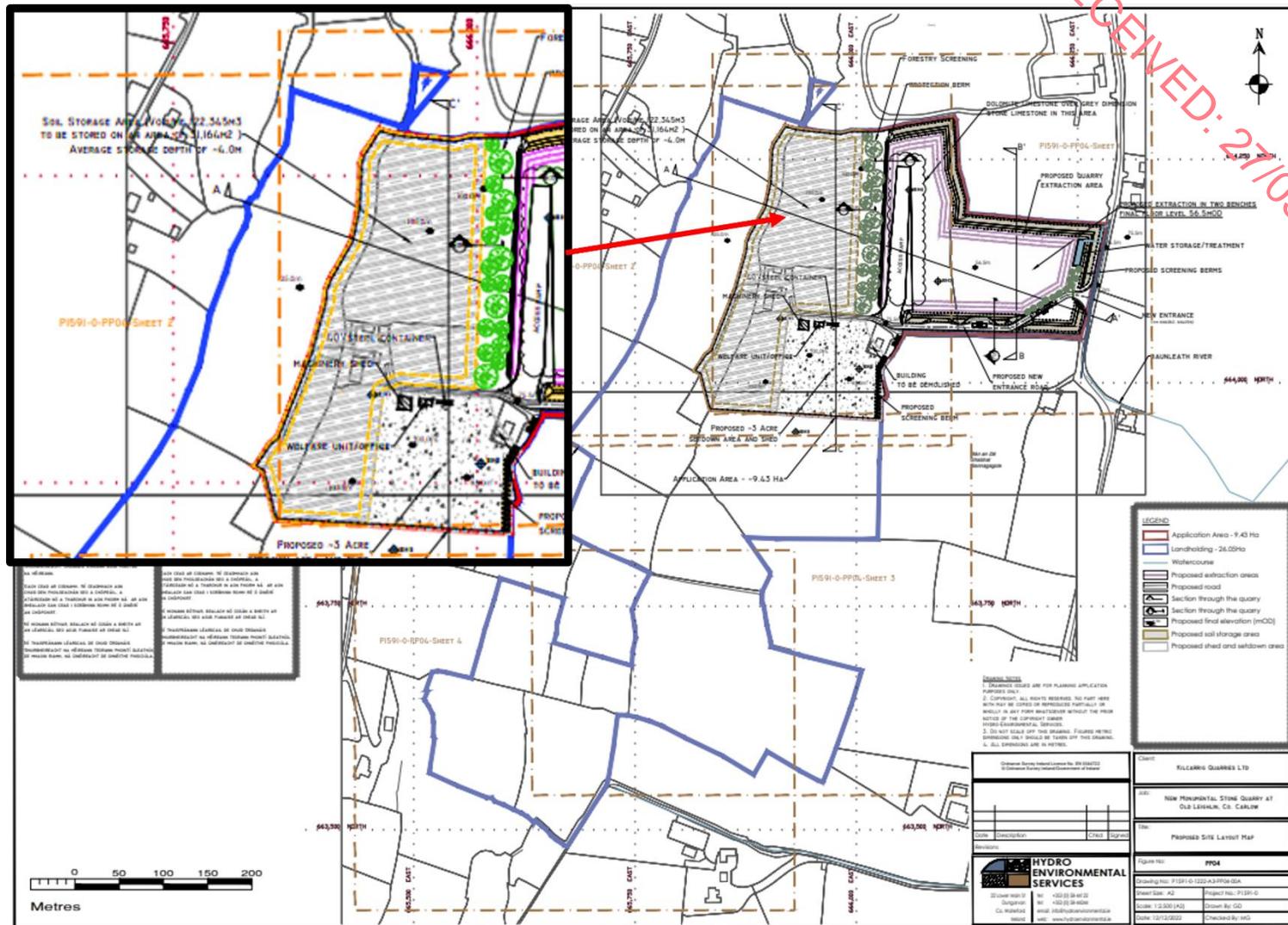
The site is accessed from the L3036 which connects to the village of Old Leighlin to the north and the R448 to the east. A small laneway extends westwards into the site from this local road. This laneway connects the road with a derelict farmhouse and associated derelict farm outbuildings (5 no.) which are located within the landholding.



This Application is made under section 34(2)(a) of the Planning and Development Act 2000, as amended, where it is acknowledged that a planning authority is restricted to considering proper planning and sustainable development with regard being had to the following matters:

- i. the provisions of the development plan,
- ii. the provisions of any special amenity area order relating to the area,
- iii. any European site or other area prescribed for the purposes of section 10(2)(c),
- iv. where relevant, the policy of the Government, the Minister or any other Minister of the Government,
- v. the matters referred to in subsection (4), and
- vi. any other relevant provision or requirement of this Act, and any regulations made thereunder.

Following these three main elements a Restoration Plan is included in the Proposed Development (further details in Section 5.7.2.4).



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Figure 5-2 Extracted from drawing P1591-0-1222-A3-PP04-00A prepared by Hydro Environmental Services (2022). Proposed soil storage location detailed in inset.

## 5.4 Methodology

This section details the steps and methodology employed to undertake a Biodiversity Chapter as part of the EIAR prepared for the Proposed Development.

### 5.4.1 Scope of Assessment

The specific objectives of the study were to:

- Undertake baseline ecological surveys and evaluate the nature conservation importance of the site;
- Identify and assess the direct, indirect, and cumulative ecological implications or impacts of the Proposed Development during its lifetime; and
- Where possible, propose mitigation measures to remove or reduce those impacts at the appropriate stage of development.
- Achieve the best possible biodiversity outcome for the future of the site.

### 5.4.2 Terms and Definitions

#### 5.4.2.1 Habitats

In terms of definitions, a habitat is the environment in which an animal or plant lives, generally defined in terms of vegetation and physical structures. As per CIEEM, 2018, a habitat is defined as: *“The place or type of site where an organism or population naturally occurs. Often used in the wider sense referring to major assemblages of plants and animals found together.”*

Habitats and species of ecological significance occurring/likely to occur within the Zone of Influence (ZOI) study area are classified as Key Ecological Receptors (KERS).

#### 5.4.2.2 Key Ecological Receptors

KERs are defined as sensitive sites, habitats, ecological features, assemblages, species, or individuals that occur within the vicinity of a Proposed Development upon which effects are likely.

The NRA (2009) defines KERs as those ecological features which are evaluated as Locally Important (higher value) or higher, that are likely to be impacted significantly by the Proposed Development. Internationally important receptors would include SACs or SPAs while those of national importance would include NHAs.

Using the comprehensive assessment of the existing environment (baseline conditions), it has been possible to accurately predict the likely effects of the Proposed Development on the KERs and correctly assign an ecological significance to them.

#### 5.4.2.3 Zone of Influence

The ZOI for a project is the area over which ecological features may be affected by changes as a result of the Proposed Development and associated activities. This is likely to extend

beyond the site, for example where there are ecological or hydrological links beyond the site boundaries (CIEEM, 2018). The ZOI will vary with different ecological features, depending on their sensitivities to an environmental change. Given the urban context of the site and the limited connectivity with habitats of ecological sensitivity, the ZOI is regarded to be relatively limited and within the site boundary for most ecological receptors, with the exception of aquatic habitats or fauna linked to the site, mammals linked to the site and Designated sites, e.g., European sites, Ramsar sites, NHAs and pNHAs, and potential pathways to groundwaters and surface waters.

To determine the ZOI of the Proposed Development for Designated sites, reference was made to the OPR Practice Note PN01 - 'Appropriate Assessment Screening for Development Management' (OPR, 2021), a practice note produced by the Office of the Planning Regulator, Dublin. This note was published to provide guidance on screening for AA during the planning process, and although it focuses on the approach a planning authority should take in screening for AA, the methodology is also readily applied in the preparation of Biodiversity Chapters of EIAR such as this; to identify relevant Designated sites potentially linked to the site. In addition, the guidance document published by the Department of Housing, Planning and Local Government (then DEHLG) 'Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities' (2009) was considered, which recommends an arbitrary distance of 15km as the precautionary ZOI for a plan or project being assessed for likely significant effects on European sites, stating however that this should be evaluated on a case-by-case basis.

As such, the 15km ZOI is used in this report as an initial starting point for collating Designated sites for this EIAR Chapter.

### 5.4.3 Desk Study

The desk study undertaken in February 2023 for this assessment included a thorough review of the available ecological data pertaining to the site's natural environment, including the following:

- Information on species records and distribution, obtained from the National Biodiversity Data Centre (NBDC) at [www.maps.biodiversityireland.ie](http://www.maps.biodiversityireland.ie);
- Information on landscape suitability for bats was obtained from the NBDC at [www.maps.biodiversityireland.ie](http://www.maps.biodiversityireland.ie) and [http://maps.biodiversityireland.ie/metadata/Landscape Conservation for Irish Bats metadata\(v.3\).pdf](http://maps.biodiversityireland.ie/metadata/Landscape_Conservation_for_Irish_Bats_metadata(v.3).pdf)
- Information on waterbodies, catchment areas and hydrological connections obtained from the EPA at [www.gis.epa.ie](http://www.gis.epa.ie);
- Information on bedrock, groundwater, aquifers and their statuses, obtained from Geological Survey Ireland (GSI) at [www.gsi.ie](http://www.gsi.ie);
- Information on the network of designated conservation sites, boundaries, qualifying interests, and conservation objectives, obtained from the NPWS at [www.npws.ie](http://www.npws.ie);

- Satellite imagery and mapping obtained from various sources and dates including Google, Digital Globe, Bing and Ordnance Survey Ireland;
- Information on the existence of permitted developments, or developments awaiting decision, in the vicinity of the Proposed Development from the National Planning Application Database available at: <https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de>;
- Information on the extent, nature and location of the Proposed Development, provided by the applicant and/or their design team;
- The current conservation status of birds in Ireland taken from Gilbert et al. (2021); and
- The pollinator friendly planning code provided by The All-Ireland Pollinator Plan (2015 – 2020, 2021 – 2025) available at [www.pollinators.ie](http://www.pollinators.ie).

A comprehensive list of all the specific documents and information sources consulted in the completion of this document is provided in section 5.11 References.

#### **5.4.3.1 Identification of Designated sites**

The methodology used to identify relevant Designated sites comprised the following:

- Use of current GIS spatial datasets for Designated sites and water catchments – downloaded from the NPWS website ([www.npws.ie](http://www.npws.ie)) and the EPA website ([www.epa.ie](http://www.epa.ie)) to identify Designated sites which could potentially be affected by the Proposed Development;
- The catchment data were used to establish or discount potential hydrological connectivity between the site boundary and any Designated sites;
- All Designated sites within the ZOI (within 15km of the site) were identified and are shown in Figure 5-4 and Figure 5-5;
- The potential for connectivity with Designated sites at distances greater than 15km from the site was also considered in this initial assessment. In this case, there is no potential connectivity between the site and Designated sites located outside of the ZOI based on the Source-Pathway-Receptor (S-P-R) model;
- Table 5-6 provides details of all relevant Designated sites as identified in the preceding steps. The potential for pathways between Designated sites and the Proposed Development were assessed on a case-by-case basis using the S-P-R framework as per the OPR Practice Note PN01 (March,2021). Pathways considered included:
  - Direct pathways e.g., proximity (i.e., location within a designated site), water bodies, air (for both air emissions and noise impacts).
  - Indirect pathways e.g., disruption to migratory paths, ‘Sightlines’ where noisy or intrusive activities may result in disturbance to shy species.

### **5.4.3.2 National Biodiversity Data Centre (NBDC) records**

The site straddles the Ordnance Survey Ireland National 2km grid squares of S66S, S66M, S66L, and S66R. Species records dated within the last 20 years were studied for the presence of invasive, rare, or protected flora and fauna. In addition, data from various sources (e.g., Inland Fisheries Ireland) were used to determine the presence of species in the vicinity of the site. These records are presented in section 5.5.3.2.

### **5.4.4 Field surveys**

A multi-disciplinary field survey has been carried out at the site of the Proposed Development to inform this EIAR Chapter. An Ecological Walkover Survey was conducted by Dr Byran Thompson on 03/06/2022, as per NRA Guidelines (2009), which incorporated habitat mapping and appraisal of the habitats, flora, and fauna of the site. Field surveys included an assessment of the potential for the support the following:

- Habitats and Flora
- Invasive Species
- Mammals
- Bird
- Bats
- Amphibians & Reptiles
- Any additional fauna (invertebrates, fish).

#### **5.4.4.1 Habitat Mapping**

Habitats at the site were surveyed and categorised according to the Heritage Council's 'A Guide to Habitats in Ireland' (Fossitt, 2000) to level 3 on the 6<sup>th</sup> of June 2022. The habitat mapping exercise had regard to the 'Best Practice Guidance for Habitat Survey and Mapping' (Smith et al., 2010) published by the Heritage Council. Habitat categories, characteristic plant species and other ecological features and resources were recorded on field sheets.

A noted limitation with regards to habitat mapping was in inaccessibility of the young conifer plantations. The density of the vegetation and the gorse understory rendered these sections of the site impenetrable. See Figure 5-6.

#### **5.4.4.2 Invasive Species Survey**

A search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was conducted on 6<sup>th</sup> June 2022.

Non-native species in Ireland have been assessed and assigned an impact rating of either 'High', 'Medium' or 'Low' impact based on several factors that determine a species' potential to become established in this country and have significant impacts (Kelly et al., 2013). Invasive species can also be rated as an 'Amber-list species', which signifies a 'Medium'

impact potential or established invasive species that may pose a threat to conservation goals (Invasive Species Ireland, 2022).

It is an offence to plant, disperse, allow or cause to disperse, spread or otherwise cause to grow any invasive species scheduled on the European Communities (Birds and Habitats) Regulations and species listed as 'high' impact under the NBDC 'Invasive Species in Ireland Prioritisation Risk Assessment' (Kelly, et al., 2013).

#### **5.4.4.3 Mammal Surveys**

Mammal surveys of the site were carried out in conjunction with the habitat surveys. The mammal surveys conducted as part of this assessment had regard for the survey guidelines contained in Guidelines for the Assessment of Ecological Impacts of National Road schemes (NRA, 2009a) and associated guidance Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, 2009b). The site was searched for signs of mammals such as burrows, setts, droppings, foraging signs and tracks. A camera trap was installed at a location where mammal activity, namely badger *Meles meles*, was suspected on the 6<sup>th</sup> of June 2022 and was retrieved on the 11<sup>th</sup> of August 2022.

#### **5.4.4.4 Breeding Bird Scoping Survey**

A breeding scoping survey of the site was undertaken on 6<sup>th</sup> June 2022. Three transects were surveyed across the site to record all the species on the present. The survey methodology broadly followed the British Trust for Ornithology's (BTO) Common Bird Census (CBS) technique (2nd edn) (Bibby et al., 2000). Each transect was divided up into four parts (all a similar distance) and the transect was walked with all species noted at each side of the ecologist. Distance brackets were also used. The majority of species were recorded inside the site boundary and within 50 meters each side of the surveyor on each transect.

#### **5.4.4.5 Bat Surveys**

During the walkover survey a general habitat assessment for bats was completed. Further surveys have not yet been completed to advise the project. As such a precautionary approach is taken to further recommendations within the chapter.

#### **5.4.4.6 Amphibians and Reptile Survey**

The site was assessed for suitable amphibian and reptile habitat, with a particular focus on the more widespread species; common frog *Rana temporaria*, smooth newt *Lissotriton vulgaris* and common lizard *Zootoca vivipara*. Natterjack toad *Bufo calamita* is more restricted in its distribution (Counties Kerry and Wexford) and is unlikely to be present at the site. The site was surveyed for potential amphibian breeding habitat (i.e., areas of pooling, wet ditches).

#### **5.4.4.7 Any additional fauna (Invertebrates, Fish)**

Invertebrate and fish species were considered for the purposes of this assessment and incorporated into the field survey as per the "Good Practice Guidance for Habitats and Species", Version 3, May 2021 by CIEEM, and "Best Practice Guidance for Habitat Survey and Mapping", (Smith, 2011).

*Table 5-1 Field surveys undertaken at the Proposed Development site*

Survey Type	Description	Date
Habitat Survey	Site walkover	03.06.2022
Invasive Flora Survey	Site walkover	03.06.2022
Mammal Survey	Site walkover	03.06.2022
	Camera trap	03.06.2022

#### 5.4.5 Methodology for Assessment of Effects

The value of the ecological resources, i.e., the habitats and species present or potentially present, was determined using the ecological evaluation guidance given in the National Roads Authority's Ecological Assessment Guidelines (NRA, 2009) and CIEEM guidelines for Ecological Impact Assessment (2018). This evaluation scheme, with values ranging from locally important to internationally important, seeks to provide value ratings for habitats and species present that are considered ecological receptors of impacts that may ensue from a proposal. These guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of any particular receptor.

This evaluation scheme has been adapted here to assess the value of habitats and fauna within the site. The value of fauna is assessed on its biodiversity value, legal status, and conservation status. Biodiversity value is based on its national distribution, abundance or rarity and associated trends. Using the evaluation criteria as described above, some of the habitats and species identified as being present were assessed as KERs. As per the NRA guidelines, impact assessment is only undertaken of KERs.

##### 5.4.5.1 Methodology to Determine Value of Ecological Resources

The ecological features identified within the site and the wider area are evaluated based on their value, as detailed in Table 5-2.

*Table 5-2 Description of Values for Ecological Resources Based on Geographic Hierarchy of Importance (NRA, 2009).*

Importance	Criteria
<b>International Importance</b>	<ul style="list-style-type: none"> <li>- 'European site' including Special Area of Conservation (SAC), site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation (pSAC).</li> <li>- Proposed Special Protection Area (pSPA). site that fulfils the criteria for designation as a 'European site' (see Annex III of the Habitats Directive, as amended).</li> <li>- Features essential to maintaining the coherence of the Natura 2000 Network</li> </ul>

Importance	Criteria
	<ul style="list-style-type: none"> <li>- site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.</li> <li>- Resident or regularly occurring populations (assessed to be important at the national level) of the following:               <ul style="list-style-type: none"> <li>o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or</li> <li>o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive</li> </ul> </li> <li>- Ramsar site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).</li> <li>- World Heritage site (Convention for the Protection of World Cultural and Natural Heritage, 1972).</li> <li>- Biosphere Reserve (UNESCO Man and The Biosphere Programme)</li> <li>- site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).</li> <li>- site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).</li> <li>- Biogenetic Reserve under the Council of Europe.</li> <li>- European Diploma site under the Council of Europe.</li> <li>- Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).</li> </ul>
<b>National Importance</b>	<ul style="list-style-type: none"> <li>- site designated or proposed as a Natural Heritage Area (NHA).</li> <li>- Statutory Nature Reserve.</li> <li>- Refuge for Fauna and Flora protected under the Wildlife Acts.</li> <li>- National Park.</li> <li>- Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.</li> <li>- Resident or regularly occurring populations (assessed to be important at the national level) of the following:               <ul style="list-style-type: none"> <li>o Species protected under the Wildlife Acts; and/or</li> <li>o Species listed on the relevant Red Data list.</li> <li>o site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive</li> </ul> </li> </ul>

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Importance	Criteria
<b>County Importance</b>	<ul style="list-style-type: none"> <li>- Area of Special Amenity.</li> <li>- Area subject to a Tree Preservation Order.</li> <li>- Area of High Amenity, or equivalent, designated under the County Development Plan.</li> <li>- Resident or regularly occurring populations (assessed to be important at the County level) of the following:               <ul style="list-style-type: none"> <li>o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;</li> <li>o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;</li> <li>o Species protected under the Wildlife Acts; and/or</li> <li>o Species listed on the relevant Red Data list.</li> <li>o site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.</li> </ul> </li> <li>- County important populations of species; or viable areas of semi-natural habitats; or natural heritage features identified in the National or Local BAP; if this has been prepared.</li> <li>- sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.</li> <li>- sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.</li> </ul>
<b>Local Importance (higher value)</b>	<ul style="list-style-type: none"> <li>- Locally important populations of priority species or habitats or natural heritage features identified in the Local Biodiversity Action Plan, if this has been prepared;</li> <li>- Resident or regularly occurring populations (assessed to be important at the Local level) of the following:               <ul style="list-style-type: none"> <li>o Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;</li> <li>o Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;</li> <li>o Species protected under the Wildlife Acts; and/or</li> <li>o Species listed on the relevant Red Data list.</li> <li>o sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;</li> </ul> </li> </ul>

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Importance	Criteria
	<ul style="list-style-type: none"> <li>- sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.</li> </ul>
<b>Local Importance (lower value)</b>	<ul style="list-style-type: none"> <li>- sites containing small areas of semi-natural habitat that are of some local importance for wildlife;</li> <li>- sites or features containing non-native species that is of some importance in maintaining habitat links.</li> </ul>

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#### 5.4.5.2 Methodology: Impact Assessment Criteria

Once the value of the identified KERs was determined, the potential effect or impact of the Proposed Development on these KERs was assessed. This was carried out with regard to the criteria outlined in various impact assessment guidelines (NRA, 2009; CIEEM, 2018; EPA, 2022) that set down a number of parameters such as quality, magnitude, extent and duration that should be considered when determining which elements of the proposal could constitute impacts or sources of impacts. Once impacts are defined, their significance was categorised using EPA Guidelines (EPA, 2022).

Identification of a risk does not constitute a prediction that it will occur, or that it will create or cause significant impact. However, identification of the risk does mean that there is a possibility of ecological or environmental damage occurring, with the level and significance of the impact depending upon the nature and exposure to the risk and the characteristics of the ecological receptor.

##### 5.4.5.2.1 Criteria Used to Define Quality of Effects

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the quality of effects (Table 5-3).

Table 5-3 Definition of quality of effects

Quality	Definition
<b>Positive Effects</b>	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
<b>Neutral Effects</b>	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
<b>Negative/adverse Effects</b>	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).

#### 5.4.5.2.2 Criteria Used to Define Significant of Effects

European Commission (EC) Guidance on EIAR (EC, 2017) states that assessment of significance should be determined using appropriate, clear, and unambiguous criteria which take “*the characteristics of the impact and the values associated with the environmental issues affected into account*”. Consequently, in line with the EPA EIAR Guidelines (EPA, 2022), the following terms are defined when quantifying the significance of impacts (Table 5-4).

*Table 5-4 Definition of Significance of Effects*

Significance of Effects	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant 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 baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration, or intensity alters a sensitive aspect of the environment
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics

#### 5.4.5.2.3 Criteria Used to Define Duration of Effects

In line with the EPA Guidelines (EPA, 2022), the following terms are defined when quantifying duration and frequency of effects (Table 5-5).

*Table 5-5 Definition of Duration of Effects.*

Quality	Definition
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.
Medium-term Effects	Effects lasting seven to fifteen years.
Long-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

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### 5.4.6 Difficulties Encountered in Compiling Information

The following difficulties/constraints were encountered when compiling information for this chapter:

- An extensive search of available datasets for records of rare and protected species within proximity of the site has been undertaken as part of this assessment. However, the records from these datasets do not constitute a complete species list. The absence of species from these datasets does not necessarily confirm an absence of species in the area.
- General habitat surveys were carried out within the standard acceptable timeframe (May-June),
- Habitats were assessed for the potential to support breeding birds and a single scoping survey was undertaken. Appropriate precautionary measures will be undertaken to ensure compliance with legislation and planning policy, in combination with further survey work.
- Habitats were visually assessed for their potential to support bat activity; however, specific bat roost and bat activity surveys were not undertaken. The precautionary principle is applied in the assessment, and further bat surveys will be required as the site may present high potential for bat roosts.
- It was not possible to survey the extreme south or most of the western fringe of the site for mammal dens, as the scrub was impenetrable (Figure 5-10).

## 5.5 Results

### 5.5.1 Description of Baseline Ecological Conditions

### 5.5.2 Geology, Hydrology and Hydrogeology

Geological, hydrological, and hydrogeological information for this site was obtained using the datasets outlined in Section 5.4.3 The site of the Proposed Development is located in the Barrow River surface water catchment within (14) of the Southeastern River Basin District. This catchment includes the area drained by the River Barrow upstream of the River Nore confluence and all streams entering tidal water between the Barrow railway bridge at Great

Island and Ringwood, Co. Kilkenny, draining a total area of 3,025km<sup>2</sup>. The Barrow catchment comprises 20 sub-catchments.

On a local scale, the site is located in the Barrow\_110 sub-catchment (Barrow\_SC\_110) and the Old Leighlin stream\_020 river sub-basin. Further to the south, the southern section of the overall landholding is located in the Barrow\_190 river sub-basin.

Within the Old Leighlin stream\_020 river sub-basin, the Baunleath stream (EPA Code: 14B95) originates to the southeast of the site along the L3036. This stream flows to the east before veering northwards and discharging into the Old Leighlin stream (EPA Code: 14O02) (also known as the Madlin River) ~2km northeast of the site. The Old Leighlin stream then flows to the southeast, discharging into the Barrow River (EPA Code: 14B01) to the south of Leighlinbridge.

The site walkover surveys (as detailed in Chapter 7, hydrology, of this EIAR) have also revealed the presence of a second drain and culvert which enters a small ditch and flows eastwards along a hedgerow northeast of the norther corner of the site. This drainage pathway crosses the L3036 via a culvert and flows to the east before discharging into the Baunleath stream.

Within the Barrow\_190 river sub-basin, the Burgage stream (EPA Code: 14B96) flows eastwards to the south of the overall landholding and discharges into the Barrow River ~3.5km east of the site.

The Q-Rating is a water quality rating system based on both the habitat and the invertebrate community assessment and is divided into status categories ranging from 0-1 (Poor) to 4-5 (Good/High). The Old Leighlin Stream (Madlin River) achieved a Q-rating of 4-5, i.e., High status, to the east of Old Leighlin (Station Code: RS14O020500) and upstream of the site in the latest WFD monitoring round (2020). Meanwhile downstream of its confluence with the Baunleath stream, the Old Leighlin stream achieved a Q-rating of 3-4, i.e., Moderate status (Station Code: RS14O020500). Further downstream the Barrow River also achieved Moderate status at the Royal Oak Bridge to the west of Bagenalstown (Station Code: RS14B012900).

In the vicinity of the site, the Old Leighlin\_020 SWB achieved 'Moderate' status in the latest WFD cycle (2016-2021) and was deemed to be 'at risk' of failing to meet its WFD objectives. Meanwhile, further downstream the Barrow\_190 and the Barrow\_200 SWBs also achieved 'Moderate' status. The risk status of the Barrow\_190 SWB is under review while the Barrow\_200 SWB is 'not at risk' of failing to meet its WFD objectives.

The 3rd Cycle Draft Barrow Catchment Report states that excess nutrients and morphological issues are the most prevalent issues in the Barrow Catchment. In the vicinity of the site, agriculture has been listed as a significant pressure on the Old Leighlin\_020 SWB. No significant pressures have been identified for the Barrow\_190 and Barrow\_200 SWBs.

There is no Urban Wastewater Treatment Plant (UWWTP) at Old Leighlin or Leighlinbridge. However, there is a UWWTP at Bagnelstown, approximately 5.5km downstream of Leighlinbridge, and treated effluent from that plant discharges to the River Barrow. For further details regarding the hydrology of the site please see Chapter 7 of this EIAR.

The Proposed Development extraction area is currently a greenfield site. The geological map of Ireland indicates that the most common type of rock to be found in the country is Limestone, a sedimentary rock.

The site is situated on the Bagnelstown Lower Groundwater Body (IE\_SE\_G\_157). The groundwater body has a status of *Good* and is *under Review* with regards to meeting its WFD objectives. Based on the Geological Survey of Ireland (GSI) database, the bedrock beneath the site is mapped as the *Clogrenan Formation* (Stratigraphic Code: CL), which comprises *Cherty, muddy, calcarenitic limestone* (GSI, 2022).

The groundwater rock units are described as *Dinantian Lower Impure Limestones* (GSI, 2022). The GSI (2022) has classified the aquifer beneath the site as a *Regionally Important Aquifer - Karstified (diffuse)*. The groundwater vulnerability rating assigned to the groundwater beneath site varies from primarily *High* to *Extreme* (Figure 5-3).

The subsoils or quaternary sediments beneath the site are mapped by the GSI (GSI, 2022), the following is present on site:

- Subsoils
  - The entire site is composed of subsoil categorised as “Till type”.
- Quaternary Sediment
  - GSI data on Quaternary Sediments reveal that the site is primarily composed of “Till derived from Namurian sandstones and shales”, (TNSSs).

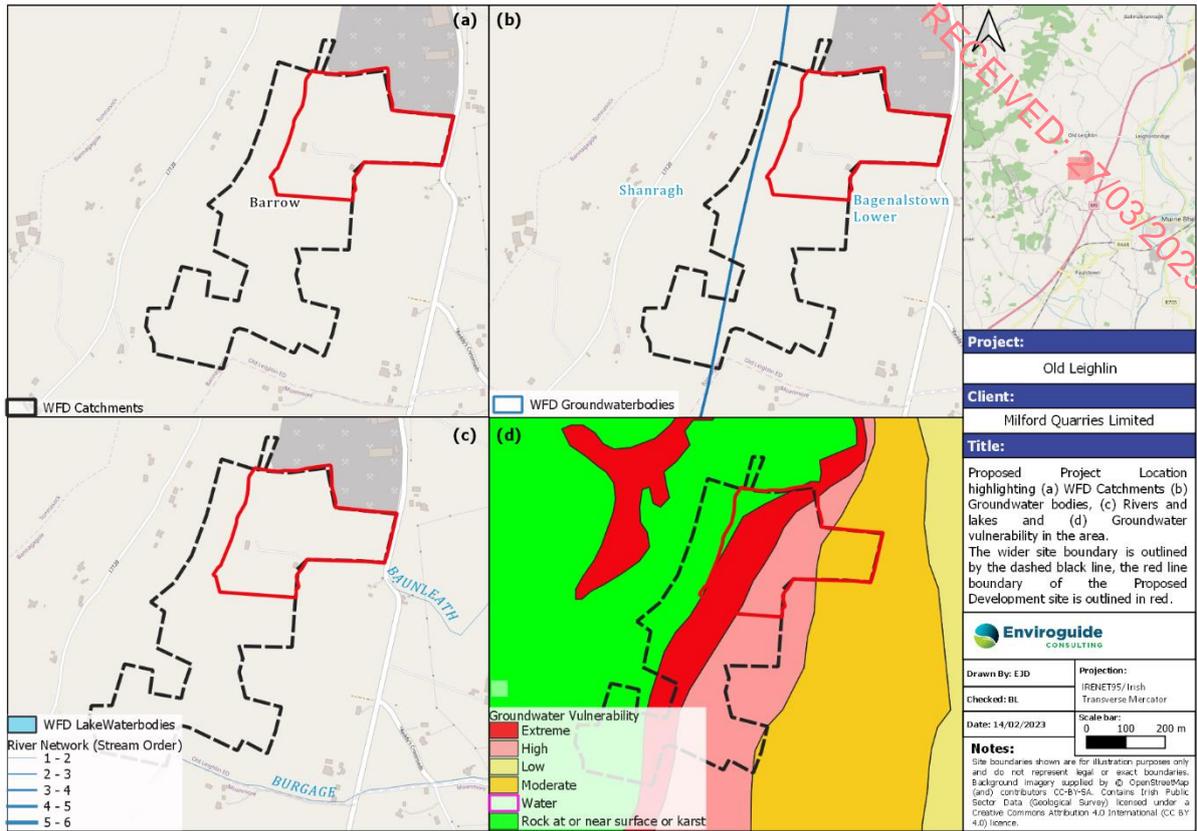
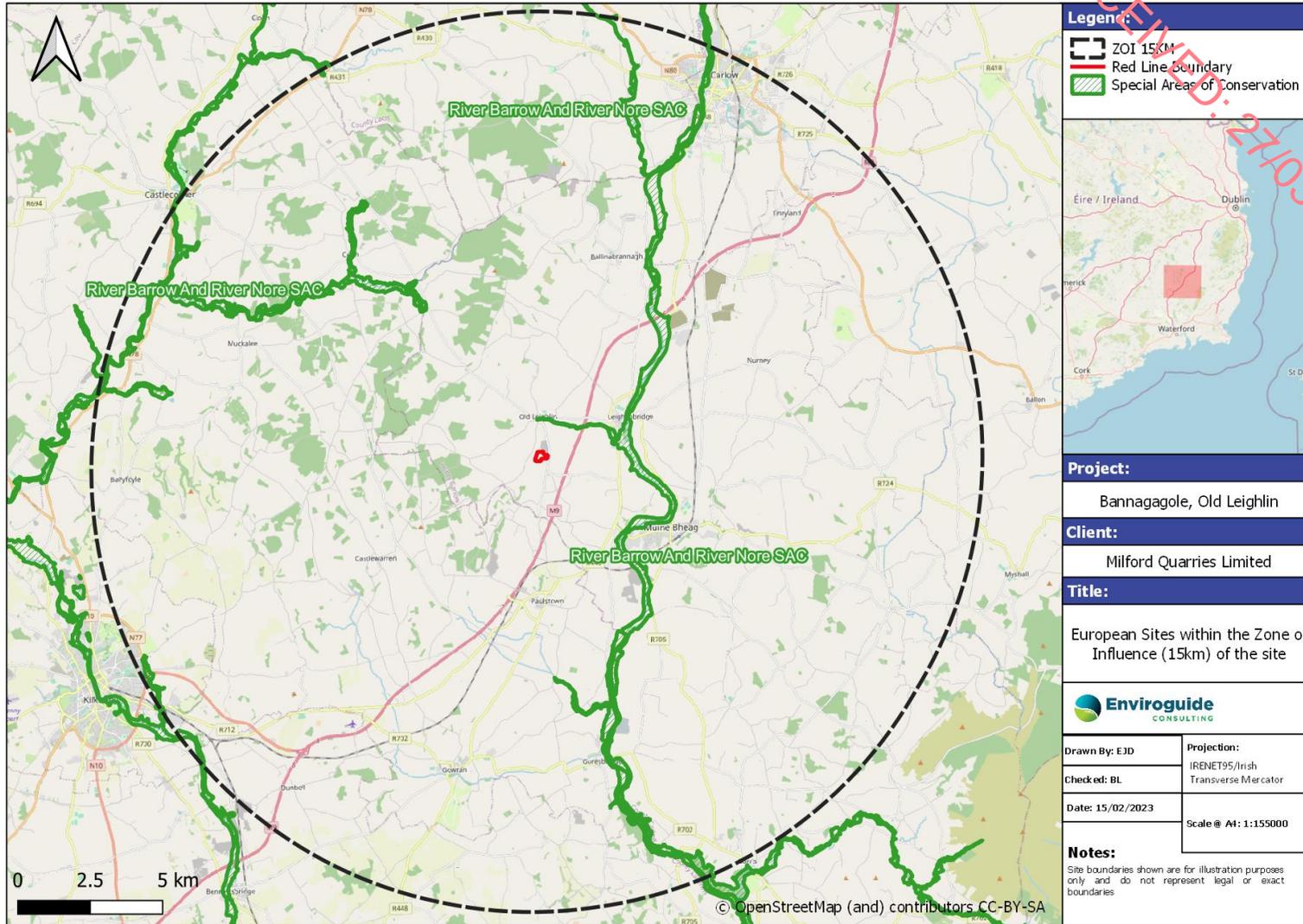


Figure 5-3 Environmental features map of the site, red line boundary for the purposes of this application highlighted in red

### 5.5.3 Desk Study Results

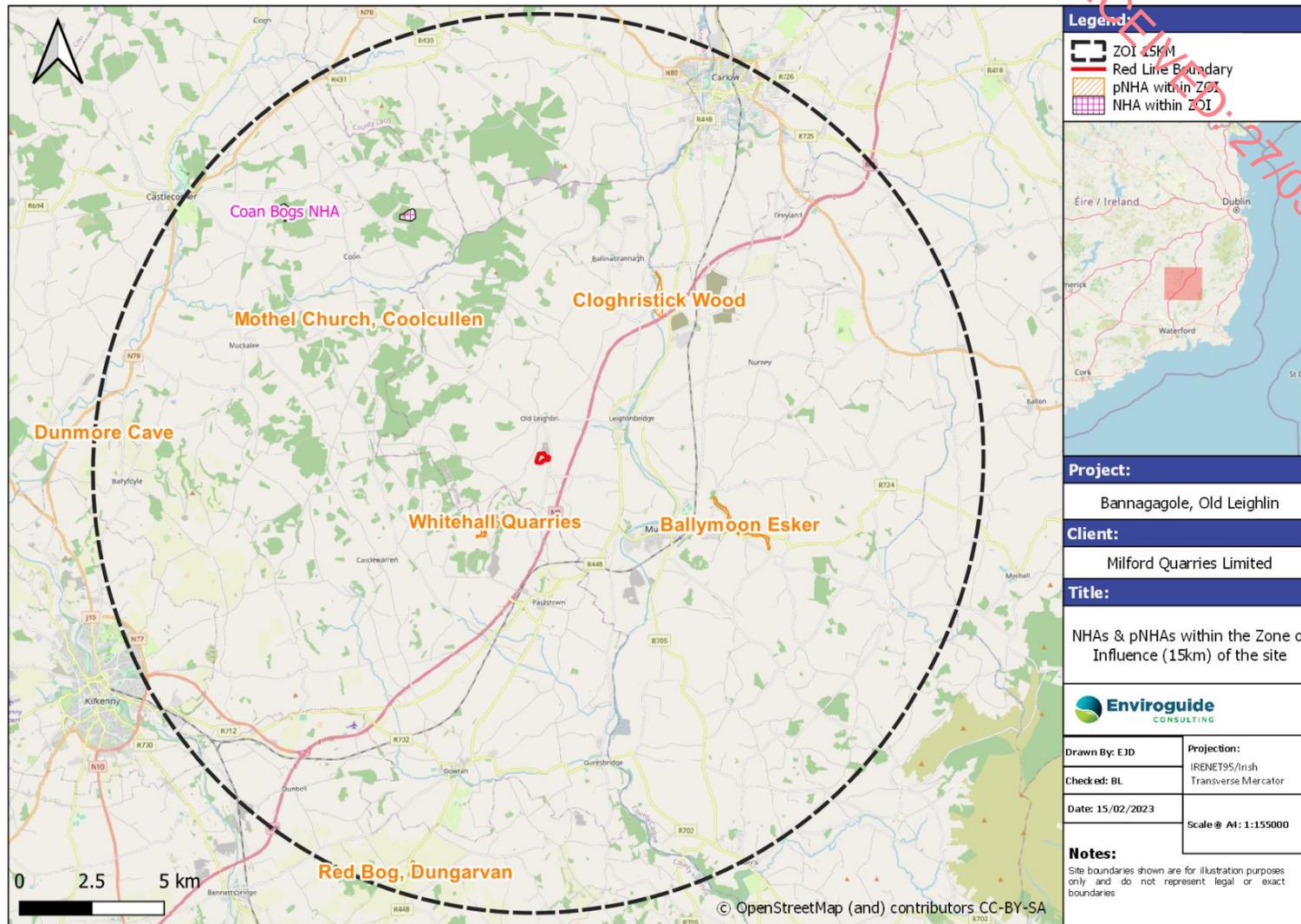
#### 5.5.3.1 Designated sites

Details of the Designated sites within the ZOI of the Proposed Development are presented in Table 5-6 below. The results of this preliminary screening concluded that there is a total of one SAC, six pNHAs and one NHA located within the precautionary ZOI of the Proposed Development site (Figure 5-4 and Figure 5-5). The distances to each site listed are taken from the nearest possible point of the Proposed Development boundary to the nearest possible point of each designated site (i.e., as the crow flies).



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Figure 5-4 International sites within 15km of the Proposed Development



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Figure 5-5 Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) within 15km of the Proposed Development

Table 5-6 Designated sites of Conservation Importance Within the Precautionary ZOI of the Site (15km)

site Name and Code (Receptor)	Qualifying Interests (Qis)	Distance to Proposed Development (KM)	Potential Pathway to receptors
<b>SAC</b>			
<p><b>River Barrow and River Nore SAC (002162)</b></p> <p><a href="https://www.npws.ie/protected-sites/sac/002162">https://www.npws.ie/protected-sites/sac/002162</a></p>	<p><b>Conservation Objectives Version 1.0 (NPWS, 2011):</b></p> <ul style="list-style-type: none"> <li>- Estuaries [1130]</li> <li>- Mudflats and sandflats not covered by seawater at low tide [1140]</li> <li>- Reefs [1170]</li> <li>- Salicornia and other annuals colonising mud and sand [1310]</li> <li>- Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) [1330]</li> <li>- Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]</li> <li>- Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]</li> <li>- European dry heaths [4030]</li> </ul>	<p>6.2 km</p>	<p>Hydrological – The site is hydrologically connected with the <i>River Barrow and River Nore SAC</i> via the Baunleath stream which flows from the site and discharges into the Madlin River (roughly 1km north of the site).</p> <p>The Madlin River downstream of the site has been designated as part of the River Barrow and River Nore SAC (002162). This designated site consists of the freshwater stretches of the Barrow and Nore River catchments upstream as far as the Slieve Bloom Mountains. The site is a SAC due to the presence of several habitats and species which are listed on Annex I/II of the E.U. Habitats Directive</p>

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site Name and Code (Receptor)	Qualifying Interests (Qis)	Distance to Proposed Development (KM)	Potential Pathway to receptors
	<ul style="list-style-type: none"> <li>- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]</li> <li>- Petrifying springs with tufa formation (<i>Cratoneurion</i>) [7220]</li> <li>- Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]</li> <li>- Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0]</li> <li>- <i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016]</li> <li>- <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]</li> <li>- <i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]</li> <li>- <i>Petromyzon marinus</i> (Sea Lamprey) [1095]</li> <li>- <i>Lampetra planeri</i> (Brook Lamprey) [1096]</li> </ul>		

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site Name and Code (Receptor)	Qualifying Interests (Qis)	Distance to Proposed Development (KM)	Potential Pathway to receptors
	<ul style="list-style-type: none"> <li>- <i>Lampetra fluviatilis</i> (River Lamprey) [1099]</li> <li>- <i>Alosa fallax fallax</i> (Twaite Shad) [1103]</li> <li>- <i>Salmo salar</i> (Salmon) [1106]</li> <li>- <i>Lutra lutra</i> (Otter) [1355]</li> <li>- <i>Trichomanes speciosum</i> (Killarney Fern) [1421]</li> <li>- <i>Margaritifera durrovensis</i> (Nore Pearl Mussel) [1990]</li> </ul>		
<b>NHA</b>			
<b>Coan Bogs NHA (002382)</b>	<p>Coan Bogs NHA consists of two small areas of upland blanket bog located to the east of Castlecomer, Co. Kilkenny. The first bog lies in the townland of Coan East, 2.5 km to the north-east of Coan village at the altitude 270 m to 281 m. The second bog is situated 3 km to the north-west of Coan village in the townland of Smithstown. It lies at an altitude of 240 m. Bedrock geology for both areas is shale overlain locally by glacial till. Blanket bog vegetation is well developed in central areas of both bogs although cutover surrounds them. Plantation forestry also</p>	9.1 km northwest of site	<p>None.</p> <p>NHA is located in a separate catchment (Nore River catchment) and is underlain by the Castlecomer GWB.</p>

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site Name and Code (Receptor)	Qualifying Interests (Qis)	Distance to Proposed Development (KM)	Potential Pathway to receptors
	surrounds the sites. Coan Bogs NHA is a site of considerable conservation significance consisting of upland blanket bog. This site, although small, is undisturbed and shows good characteristics of blanket bog with some raised bog indicator species.		
<b>pNHA</b>			
<b>Whitehall Quarries pNHA (855)</b>	Two disused shale/slate quarries 5km west of Bagnelstown. The quarry tips and the floors of the old working areas now provide a rich variety of dry acidic habitats, the substrate varying in stability and particle size etc. These have been colonised to a greater or lesser extent by a variety of plants typical of such dry habitats such as Bilberry ( <i>Vaccinium myrtillus</i> ). Although degraded by recent management, the vegetation has the potential to recover	2.3 km southwest of site	None.  Surface and groundwater flows at the site follow surface topography and flow to the northeast towards the Madlin River.  In addition, the Moanmore stream acts as a hydrological barrier between the site and this pNHA.
<b>Ballymoon Esker pNHA (797)</b>	Calcareous grassland covers much of the esker and at the southern end contains several rare plant species, two of which are legally protected (Flora Protection Order 1987), Green-winged Orchid ( <i>Orchis morio</i> ) and Basil Thyme ( <i>Acinos arvensis</i> ). In addition, the scarce Bee Orchid ( <i>Ophrys apifera</i> ) occurs. Other species included in the grassland are Yarrow ( <i>Achillea millefolium</i> ), Lady's Bedstraw ( <i>Galium</i>	5.8 km southeast of site	None.  River Barrow acts as a hydrological buffer between the site and this pNHA.

site Name and Code (Receptor)	Qualifying Interests (Qis)	Distance to Proposed Development (KM)	Potential Pathway to receptors
	<i>verum</i> ), Common Bird's-foot-trefoil ( <i>Lotus corniculatus</i> ), Smooth Meadow-grass ( <i>Poa pratensis</i> ), Quaking-grass ( <i>Briza media</i> ) and sedges ( <i>Carex flacca</i> and <i>Carex caryophylla</i> ).		
<b>Cloghristick Wood pNHA (806)</b>	Oak ( <i>Quercus</i> spp.), Beech ( <i>Fagus sylvatica</i> ) and Hazel ( <i>Corylus avellana</i> ) occur, although Willows ( <i>Salix</i> spp.) are the dominant species. The ground flora comprises a range of wetland and woodland species. The wood is of value as it is typical and, by standards prevailing in County Carlow, quite large.	6.1 km northeast of site	None. pNHA is located on the eastern banks of the Barrow River, upstream of the site.
<b>Mothel Church, Coolcullen pNHA (408)</b>	A bat roost site is located in the loft of the Church of Ireland, Mothel, Coolcullen, Co. Kilkenny. A nursery colony of Natterer's bats ( <i>Myotis nattereri</i> ) use the loft and bell tower of the church. Over 100 bats were counted at the site in 1993 making it one of the biggest in the country. The Natterer's Bat is an uncommon bat in Ireland, only several thousand are known from throughout the island.	7.7 km northwest of site	None. Isolated church building. No connectivity to site (due to distance), with Natterer's bats typical traveling no further than 6km from roost sites to forage
<b>Red Bog, Dungarvan pNHA (846)</b>	The Red Bog Natural Heritage Area, located 2km north of Dungarvan in County Kilkenny, is an interesting wetland area surrounded by wet grassland and scrub. Afforestation has reduced the size of this site considerably and it is now bounded on the east and west	14.3 km southwest of site	None, No pathway to site from the Proposed Development.

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site Name and Code (Receptor)	Qualifying Interests (Qis)	Distance to Proposed Development (KM)	Potential Pathway to receptors
	<p>sides by conifer plantations. The main habitat is floating fen comprised of emergent vegetation with several small areas of open water. The vegetation is dominated by Bulrush (<i>Typha latifolia</i>) and Saw Sedge (<i>Cladium mariscus</i>), a plant which is much more common in the west of Ireland. The flora is of local interest and the site supports several species of waterfowl in the winter.</p>		
<p><b>Dunmore Cave pNHA (401)</b></p>	<p>Dunmore Cave is a tourist cave owned by the Office of Public Works which is used by at least 50 Natterer's bats (<i>Myotis nattereri</i>) during the summer months. It is a fossil cave located in an isolated limestone outcrop on the Castlecomer plateau, over-looking the Dinin River Valley, approximately seven miles north of Kilkenny City. It is possible that more bats roosted in the cave before it was developed and opened to the public in the late 1960's. It is possible that this bat also hibernates in the cave during the winter. As only a few thousand Natterer's Bat have been recorded throughout Ireland in the past ten years, this site is definitely of national importance and possibly of international importance.</p>	<p>14.9 km west of the site.</p>	<p>None, No pathway to site from the Proposed Development.</p>

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### 5.5.3.2 Species and Species Groups

The Proposed Development spans the Ordnance Survey Ireland National tetrads of S66S, S66M, S66L and S66R. Species records from NBDC online database for these grid squares was studied for the presence of rare or protected flora and fauna. The following records were excluded:

- Records greater than 20 years old;
- Species records with no designation or conservation status (excluding mammals and birds).
- Records of species placed on the Waiting List or identified as Least Concern, Data Deficient, Near Threatened or Not Evaluated in national red lists (Lockhart et al., 2012; Wyse Jackson et al., 2016), unless they are listed on the Flora Protection Order<sup>2</sup>

In addition, data from various sources (e.g., Flora Protection Order Map Viewer) were used to determine the presence of rare or protected species in the vicinity of the Proposed Development.

#### 5.5.3.2.1 Rare and Protected Flora

Species records from NBDC online database for tetrads S66S, S66M, S66L, and S66R were studied for the presence of rare or protected flora species. Though 49 distinct plant species are recorded within 1 km of these tetrads, these databases contained no records of rare and protected flora within the last 30 years.

#### 5.5.3.2.2 Invasive Plant Species

Species records from the National Biodiversity Data Centre (NBDC) online database for tetrads S66S, S66M, S66L, and S66R were studied for the presence of invasive plant species. Though 49 distinct plant species are recorded within 1 km of these tetrads, these databases contained no records of invasive plant within the last 30 years.

#### 5.5.3.2.3 Birds

Table 5-7 outlines the 11 red-listed and 22 amber-listed bird species recorded within the 15km ZOI of the site according to Article 12 Data from the NPWS. Amber listed species are of medium conservation concern, while red-list species are of high conservation concern. The 15km ZOI is deemed appropriate to consider in this case due to the biogeographic characteristics of bird species. Further to this

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<sup>2</sup> According to Wyse Jackson et al (2016) those species listed as Critically Endangered, Endangered or Vulnerable comprise Ireland's Red-listed taxa.

*Table 5-7 Recorded red- and amber- list bird species within 15km of the site*

Common Name	Scientific Name	BoCCI	Title of Dataset
Great Crested Grebe	<i>Podiceps cristatus</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Mute Swan	<i>Cygnus olor</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Greylag Goose	<i>Anser anser</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Mallard	<i>Anas platyrhynchos</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Tufted Duck	<i>Aythya fuligula</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Goosander	<i>Mergus merganser</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Kestrel	<i>Falco tinnunculus</i>	Red	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Coot	<i>Fulica atra</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Lapwing	<i>Vanellus vanellus</i>	Red	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Snipe	<i>Gallinago gallinago</i>	Red	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Woodcock	<i>Scolopax rusticola</i>	Red	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Common Sandpiper	<i>Actitis hypoleucos</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Stock Dove	<i>Columba oenas</i>	Red	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Swift	<i>Apus apus</i>	Red	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Kingfisher	<i>Alcedo atthis</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Skylark	<i>Alauda arvensis</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Sand Martin	<i>Riparia riparia</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)

Common Name	Scientific Name	BoCCI	Title of Dataset
Swallow	<i>Hirundo rustica</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Meadow Pipit	<i>Anthus pratensis</i>	Red	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Grey Wagtail	<i>Motacilla cinerea</i>	Red	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Whinchat	<i>Saxicola rubetra</i>	Red	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Willow Warbler	<i>Phylloscopus trochilus</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Goldcrest	<i>Regulus regulus</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Spotted Flycatcher	<i>Muscicapa striata</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Starling	<i>Sturnus vulgaris</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Tree Sparrow	<i>Passer montanus</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Greenfinch	<i>Chloris chloris</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Yellowhammer	<i>Emberiza citrinella</i>	Red	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Red Grouse	<i>Lagopus lagopus hibernica</i>	Red	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Linnet	<i>Linaria cannabina</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
House Sparrow	<i>Passer domesticus</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
House Martin	<i>Delichon urbicum</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)
Gadwall	<i>Mareca strepera</i>	Amber	Article 12 2019 Reporting Breeding Distributions and Ranges (2013 - 2019)

#### 5.5.3.2.4 Non-volant Mammals

Records for terrestrial mammals were retrieved from the NBDC online database. No terrestrial mammals recorded within the relevant 2km tetrads. One sighting of a live Irish Stoat, *Mustela erminea subsp. hibernica*, was recorded in 2018. Suitable Otter *Lutra lutra* freshwater habitats

are located roughly 1km north of the site according to the NBDC records with the watercourse adjacent the site offering negligible foraging or commuting potential.

#### 5.5.3.2.5 Bats

Records for bat species recorded in 2km National Grid Squares were retrieved from the NBDC online database.

No records of bat activity exist from tetrads S66S, S66M, S66L, or S66R.

The NBDC maps landscape suitability for bats based on Lundy *et al.*, (2011). The model divides the country into 1km grid squares and ranks the habitat within the squares according to its suitability for various bat species and provide a visual map of the broad scale geographic patterns of occurrence and local roosting habitat requirements for Irish bat species. The area surrounding the site carries an overall bat suitability score of 29.33 out of 100. The species with the highest individual suitability scores for the area encompassing the site are common pipistrelle (*Pipistrellus pipistrellus*), Soprano pipistrelle (*Pipistrellus pygmaeus*) and brown long-eared bat (*Plecotus auratus*), with 46, 40 and 40, respectively.

#### 5.5.3.2.6 Fish

No marine mammals or fish species were recorded within the 2km grid squares by the NBDC. The site does maintain a hydrological connection to the *River Barrow and River Nore SAC (002162)* which does list several fish species as SCIs (Table 5-6).

#### 5.5.3.2.7 Amphibians and Common Lizard

No records of amphibian or reptile activity exist from tetrads S66S, S66M, S66L, or S66R.

#### 5.5.3.2.8 Invertebrates

No records of invertebrate activity exist from tetrads S66S, S66M, S66L, or S66R.

### 5.5.4 Field Surveys

#### 5.5.4.1 Habitats and Flora

Habitats within and adjacent to the site were coded and categorised as per Fossitt (2000). Table 5-8 below outlines the habitats identified and the plant species identified within those habitats. A habitat map of the site is shown in Figure 5-6 Habitat map of site.

Table 5-8 Habitats observed during field survey classified as per Fossitts.

Fossitt Code	Description	Flora	
WL1	Hedgerow (top lane)	Hawthorn	<i>Crataegus monogyna</i>
		Blackthorn	<i>Prunus spinosa</i>
		Dog Rose	<i>Rosa canina</i>

Fossitt Code	Description	Flora	
		Bluebell	<i>Hyacinthoides non-scripta</i>
		Bramble	<i>Rubus fruticosus</i>
		Ivy	<i>Hedera helix</i>
		Foxglove	<i>Digitalis purpurea</i>
		Cows Parsley	<i>Anthriscus sylvestris</i>
WL2	Treeline (road)	Grey willow	<i>Salix cinerea</i>
		Ash	<i>Fraxinus excelsior</i>
		Hawthorn	<i>Crataegus monogyna</i>
		Hazel	<i>Corylus</i>
		Sycamore	<i>Acer pseudoplatanus</i>
		Wild Cherry	<i>Prunus avium</i>
		Hogweed	<i>Heracleum sphondylium</i>
		Nettle	<i>Urtica dioica</i>
		Dandelion	<i>Taraxacum officinale</i>
		Broad leaved dock	<i>Rumex obtusifolius</i>
		Ivy	<i>Hedera helix</i>
		Herb Robert	<i>Geranium robertianum</i>
		Marsh thistle	<i>Cirsium palustre</i>
GS2	Dry Meadows and Grassy Verge	Smooth hawkbeard	<i>Crepis capillaris</i>
		Hogweed	<i>Heracleum sphondylium</i>
		Bramble	<i>Rubus fruticosus</i>
		Ribwort plantain	<i>Plantago lanceolata</i>
		Greater plantain	<i>Plantago major</i>
		Bush vetch	<i>Vicia sepium</i>
		Red clover	<i>Trifolium pratense</i>
		Bloody crane's-bill	<i>Geranium sanguineum</i>
		Ox-eye daisy	<i>Leucanthemum vulgare</i>
		Dandelion	<i>Taraxacum officinale</i>
		Great willowherb	<i>Epilobium hirsutum</i>
		Lesser trefoil	<i>Trifolium dubium</i>
		Common birds foot trefoil	<i>Lotus corniculatus</i>
		Meadow vetchling	<i>Lathyrus pratensis</i>

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Fossitt Code	Description	Flora	
GA1	Improved Agricultural Grassland	Perennial ryegrass	<i>Lolium perenne</i>
		Shepherd's purse	<i>Capsella bursa-pastoris</i>
		Common dock	<i>Rumex obtusifolius</i>
		Nettle	<i>Urtica dioica</i>
		Common bent	<i>Agrostis capillaris</i>
		Thistle	<i>Cirsium sp.</i>
WL2	Treeline (lane)	Ash	<i>Fraxinus excelsior</i>
		Hawthorn	<i>Crataegus monogyna</i>
		Blackthorn	<i>Prunus spinosa</i>
		Hazel	<i>Corylus avellana</i>
		Elder	<i>Sambucus nigra</i>
BL2	Earthen bank with vegetation	Creeping cinquefoil	<i>Potentilla reptans</i>
		Marsh thistle	<i>Cirsium palustre</i>
		Bramble	<i>Rubus fruticosus</i>
WD4	Conifer plantation	Scot's Pine	<i>Pinus sylvestris</i>
		Fir sp.	
BL3	Buildings and Artificial Surfaces	Built structure within the site which sites abandoned.	

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The site area is predominantly conifer plantation, containing Scot's pine *Pinus sylvestris* and some commercial species. (WD4) and improved agricultural grassland (GA1), while treeline and hedgerows, (WL1 and WL2), constitute the main ecological value of the site. Also present are grassy verges, dry meadows and improved agricultural grasslands (GS2 and GA1). No invasive species are present apart from Sycamore *Acer pseudoplatanus*, which will be considered in the impacts section.

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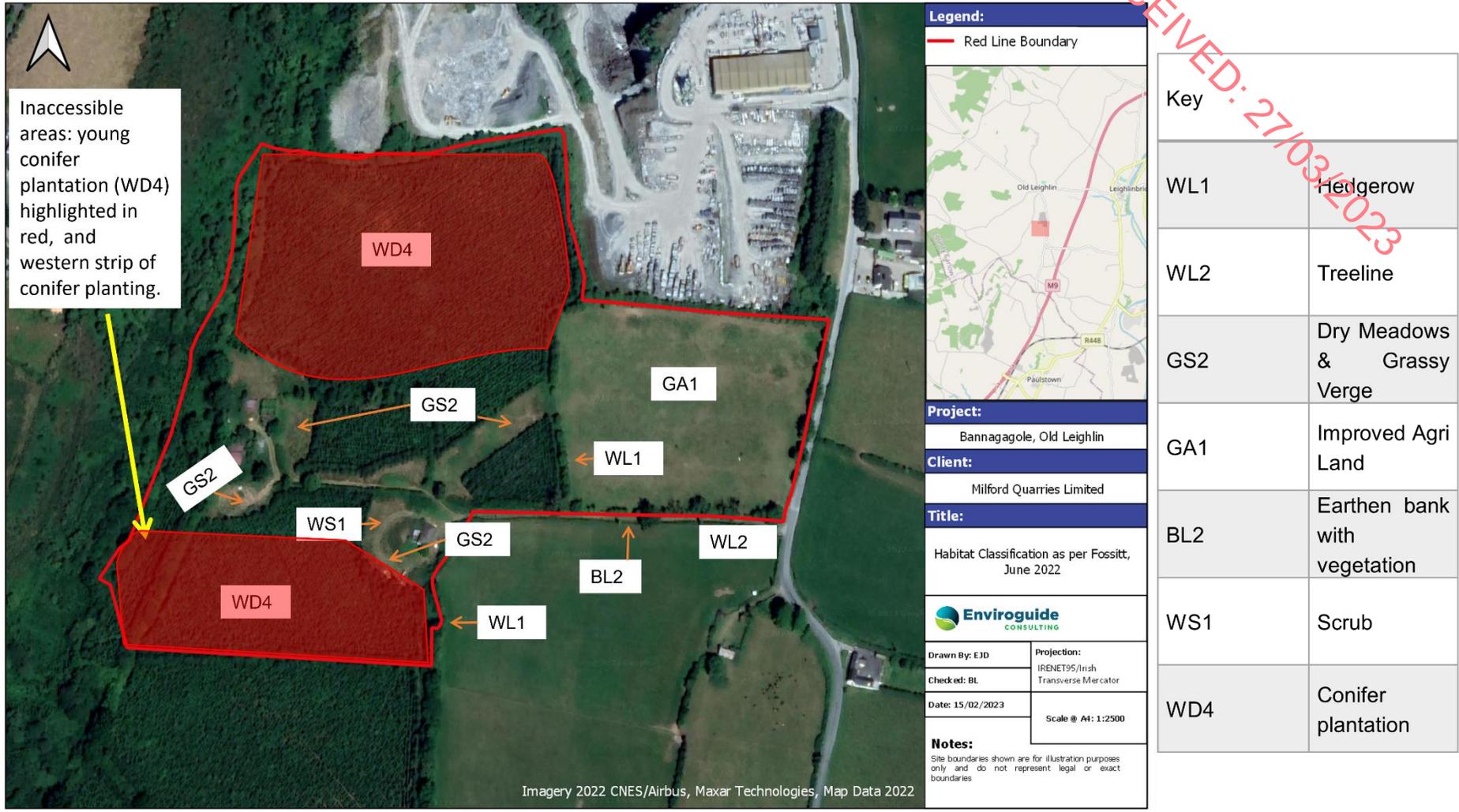


Figure 5-6 Habitat map of site (limitations to access highlighted in red)

#### 5.5.4.1.1 WL1 – Hedgerow and WL2 Treelines

Hedgerows (WL1) and Treelines (WL2) comprise the primary ecological value of the site, and function as active boundaries internally and external to the site. (Figure 5-7).

WL1 and WL2 habitats were observed bounding the site along the southern and eastern portions of the site boundary. Their construction was primarily linear and their structure was overgrown with dense bases. The condition of the hedgerows and treelines was generally good, with minimal gaps observed. These habitats occurred adjacent to a local road to the east of the site, the L3036, adjacent to agricultural land, and adjacent to the conifer plantation within the southern portion of the site. Common hedgerow tree species were present including Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), and Grey Willow (*Salix cinerea*). Trees were of varying age, and examples of young oak (*Quercus sp.*) were observed. Other common species such as Dog Rose (*Rosa canina*), Greater Stitchwort (*Rubus holostea*), Ivy (*Hedera sp.*), and Bramble (*Rubus sp.*) were also present. Some management was observed along the roadway where hedgerows were trimmed, presumably with a bar cutter (to partial height). Hedgerow features also exist along the western boundary of the site, but were inaccessible during survey.



Figure 5-7 Clockwise from top left: WL1, WL1 with taller tree species; and WL2

#### 5.5.4.1.2 GS2 – Dry Meadow and Grassy Verge

Corridors of GS2 link the GA1 habitat directly south of Old Leighlin Quarry, with further pockets of GS2 present throughout the site (Figure 5-6 and Figure 5-8). Floral species observed within this habitat include Ribwort plantain (*Plantago lanceolata*), Ox-eye daisy (*Leucanthemum vulgare*), Meadow vetchling (*Lathyrus pratensis*), Hogweed (*Heracleum sphondylium*) and Red clover (*Trifolium pratense*).



*Figure 5-8 GS2 Dry Meadows and grassy verges*

#### **5.5.4.1.3 GA1 – Improved Agricultural Grassland**

The GA1 habitat is located directly south of the Old Leighlin Quarry site, within the site boundary. Perennial ryegrass, species of dock, nettle and thistle were observed (Figure 5-9).



*Figure 5-9 GA1 Improved agricultural grassland*

#### 5.5.4.1.4 WD4 – Conifer Plantation

Along the southern section of the site is located a conifer plantation (WD4) (Figure 5-10). Access was not possible in the southern portion of the site due to dense vegetation.



*Figure 5-10 Example of dense conifer vegetation*

#### 5.5.4.1.5 BL3 – Buildings and Artificial Surfaces

Figure 5-11 presents an example of abandoned and vacant property that sits within the site, among overgrown “weedy” vegetation, with ivy encroaching along the exterior walls. The building is no longer in use, with evident damage to windows where glass is shattered. Drawings submitted as part of the Proposed Development plans detail three such buildings are on site, and all three are to be demolished.

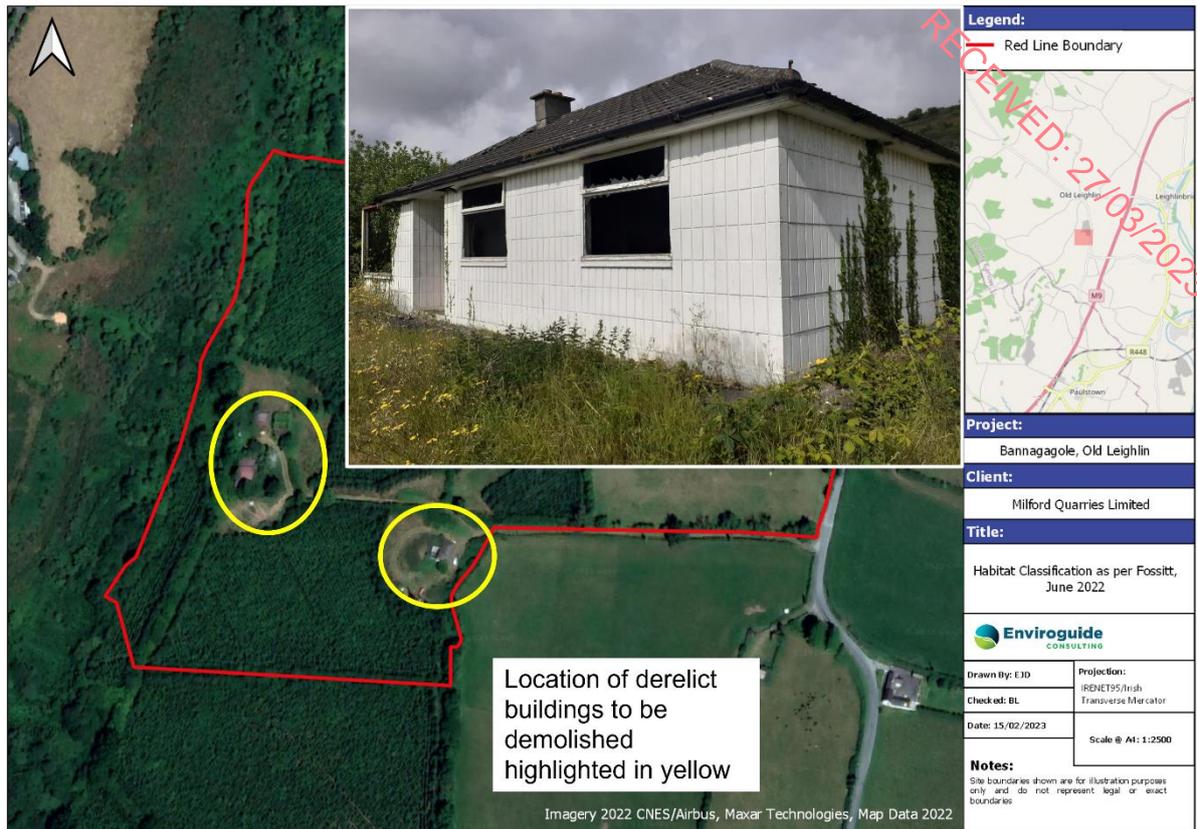


Figure 5-11 BL3 - Buildings and artificial surfaces & their locations

#### 5.5.4.2 Invasive Flora

One species of invasive flora listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011, as amended) was recorded at the site. Sycamore was observed within the WL2 – Treeline habitat along the local road to the east of the site (L3036). Sycamore is a naturalised invasive species but with ecological benefits, being one of the best functional ecological replacements for ash (in anticipation of ash die-back greatly reducing the ash population), hence removal of sycamore is a low priority/undesirable.

#### 5.5.4.3 Non-volant Mammals

Mammal signs in the form of scat, flattened grassy areas, and trails leading into hedgerow vegetation were recorded throughout the site. The observed indicators suggest possible badger, fox *Vulpes vulpes*, and hedgehog activity. In addition, the camera trap footage recorded both badger and Fox activity (Table 5-9, Figure 5-12 and Figure 5-13). No badger setts, latrines or snuffle holes were observed within the site.

Table 5-9 Summary of camera trail results

Mammal Species	Date	Time	No. Individuals
Fox <i>Vulpes vulpes</i>	29.06.2022	07:53	1

Mammal Species	Date	Time	No. Individuals
Badger <i>Meles meles</i>	04.07.2022	21:56	1



Figure 5-12 Image of Red fox *Vulpes vulpes* captured at 07:53am on the 29/06/2022 on the trail camera installed at the site.



Figure 5-13 Image of *Badger meles* captured at 21:56pm on the 04/07/2022 on the trail camera installed at the site

#### 5.5.4.4 Breeding Birds

The Proposed Development site offers suitable foraging habitat for both summering and wintering birds, such as treeline, hedgerow, and grassland habitats. Furthermore, the site contains a number of habitats suitable for a variety of resident and migrating breeding species, these include the linear treeline, plantation wood hedgerow and dry meadow.

Twenty-seven species were recorded on the Breeding Bird Scoping Survey. These species are listed in the table below.

Table 5-10 Bird Species Observed During Breeding Bird Scoping Survey

Species	Scientific name	BOCCI Status	Breeding Activity
Blackbird	<i>Turdus merula</i>	Green	
Blackcap	<i>Sylvia atricapilla</i>	Green	
Blue Tit	<i>Cyanistes caeruleus</i>	Green	

Species	Scientific name	BOCCI Status	Breeding Activity
Bullfinch	<i>Pyrrhula pyrrhula</i>	Green	
Chaffinch	<i>Fringilla coelebs</i>	Green	
Chiffchaff	<i>Phylloscopus collybita</i>	Green	
Dunnock	<i>Prunella modularis</i>	Green	
Goldfinch	<i>Carduelis carduelis</i>	Green	Recently fledged juvenile
Great Tit	<i>Parus major</i>	Green	
Hooded Crow	<i>Corvus cornix</i>	Green	
House Sparrow	<i>Passer domesticus</i>	Amber	
Jackdaw	<i>Corvus monedula</i>	Green	
Lesser Redpoll	<i>Acanthis flammea</i>	Green	
Long-tailed Tit	<i>Aegithalus caudatus</i>	Green	Recently fledged juvenile
Magpie	<i>Pica pica</i>	Green	
Peregrine	<i>Falco peregrinus</i>	Green	
Pied Wagtail	<i>Motacilla alba yarrelli</i>	Green	
Raven	<i>Corvus corax</i>	Green	
Robin	<i>Erithacus rubecula</i>	Green	Recently fledged juvenile
Rook	<i>Corvus frugilegus</i>	Green	
Siskin	<i>Spinus spinus</i>	Green	
Stonechat	<i>Saxicola torquatus</i>	Green	

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Species	Scientific name	BOCCI Status	Breeding Activity
Swallow	<i>Hirundo rustica</i>	Amber	
Song Thrush	<i>Turdus philomelos</i>	Green	
Willow Warbler	<i>Phylloscopus trochilus</i>	Amber	
Woodpigeon	<i>Columba palumbus</i>	Green	
Wren	<i>Troglodytes troglodytes</i>	Green	

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#### 5.5.4.5 Bats

The boundary features, namely, woodland edge, linear woodland and hedgerows provide good commuting corridors for bats across the site and within the wider landscape. Furthermore, these habitats in combination with dry meadow, offer suitable foraging habitat for a variety of bat species. Trees, including those within the linear tree line and hedgerow and the buildings on site may provide suitable roost features for bats.

Therefore, in the absence of targeted bat surveys during the relevant bat surveying season, in adherence to current best practice guidelines, it is assumed the site offers high suitability roost features and is of high importance for the local bat assemblage as a foraging and commuting resource. Section 5.7.1.9 provides details regarding bat surveying and the timing and mitigation with respect to tree felling and derelict building removal. In general, the timings for different bat surveys are:

- Bat Risk Assessment or Preliminary Roost Assessment
  - Year Round
- Bat Emergence Surveys
  - May to September
  - Optimal period May to August
- Bat Aerial Surveys
  - May to September
  - Optimal period May to August
- Bat Activity Surveys
  - May to September
- Bat Hibernation Surveys (Structures)
  - November to March
- Maternity Roost Survey
  - March to August

#### 5.5.4.6 Amphibians and Common Lizard

There were no direct observations of amphibians and/or reptiles at the site during field survey in June 2022. No areas of standing water were present on site that might provide breeding

habitats for amphibians such as common frog (*Rana temporaria*), however, the culverted stream/drain identified adjacent to the site with associated riparian habitat presents a potential amphibian habitat. Common lizard (*Zootoca vivipara*) may utilise some of the habitats on site such as hedgerows as important corridors for movement and foraging opportunities.

#### **5.5.4.7 Other Species and Species Groups**

No suitable habitats were observed within the site for other species such as fish species, notable terrestrial invertebrate species or freshwater invertebrate species.

The site does maintain a hydrological connection to the *River Barrow and River Nore SAC (002162)* which does list several fish species as SCIs (Table 5-6).

#### **5.5.5 Designated sites, Habitat, and Species Evaluation**

Designated flora and/or fauna which have the potential to utilise habitats within the immediate area of the Proposed Development, or for which records exist in the wider area, have been evaluated in Table 5-11 for their conservation importance. In addition, Designated sites and habitats have been evaluated. Habitats and species are evaluated based on their conservation status, distribution and the estimated population size or importance.

Table 5-11 Evaluation of Designated sites, Habitats and Fauna Recorded Within the Surrounding Area.

Designated sites/Species/Habitats	Evaluation	Key Ecological Receptor (KER)	Rationale
<b>Designated sites</b>			
<b>River Barrow and River Nore SAC</b>	International importance	Yes	The site is hydrologically connected with the <i>River Barrow and River Nore SAC</i> via the Baunleath stream which flows from the site and discharges into the Madlin River (roughly 1km north of the site).
<b>pNHAs / NHAs</b>	National importance	No	No direct or indirect pathway between the site and any NHAs/pNHAs envisaged.
<b>Habitats</b>			
<b>WL1 - Hedgerows</b>	Local importance (higher value)	<b>Yes</b>	Mature vegetative linear features provide important ecological corridors within the site and within the wider landscape.
<b>WL2- Treelines</b>	Local importance (higher value) County importance	<b>Yes</b>	Mature treelines form important ecological corridors within the site and within the wider landscape
<b>GA1 - Improved Agricultural Grassland</b>	Local importance (lower value)	<b>No</b>	May provide foraging habitat for various fauna and invertebrates.
<b>GS2 - Dry Meadow and Grassy Verge</b>	Local Importance (lower value)	<b>No</b>	May provide foraging habitat for various fauna and invertebrates, however, habitat is not listed in local plans. The NPWS semi-natural grassland survey puts GS2 occurrence at its highest in the mid-east/Dublin region (including Carlow), and rarer in border regions. GS1 and GS2 are considered closely related, releves from both overlapping in group 3 of the ISGS releves. Some of the GS2 releves are recommended to be included in surveying for Annex I 6510 (lowland hay meadows).

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Designated sites/Species/Habitats	Evaluation	Key Ecological Receptor (KER)	Rationale
<b>WD4 - Conifer Plantation</b>	Local importance (lower value)	<b>No</b>	Potential habitat and foraging opportunities for various fauna.
<b>BL3 - Buildings and Artificial Surfaces</b>	Local importance (lower value)	<b>No</b>	Potential habitat and foraging opportunities for various fauna particularly bats.
<b>Fauna</b>			
<b>Red Fox, <i>Vulpes vulpes</i></b>	Local importance (lower value)	No	Not of conservation concern in Ireland.
<b>Badger <i>Meles meles</i></b>	Local importance (higher value)	<b>Yes</b>	Recorded within the site, however no setts recorded within the site.
<b>Bat Assemblage</b>	Local importance (higher value)	<b>Yes</b>	No bat assessment undertaken; therefore a precautionary principle shall be adopted.
<b>Other small mammals (hedgehog, stoat etc.)</b>	Local importance (higher value)		
<b>Breeding Birds</b>	Local importance (higher value)	<b>Yes</b>	No bird assessment undertaken; therefore a precautionary principle shall be adopted.
<b>Amphibians and Common Lizard</b>	Local importance (higher value)	<b>Yes</b>	No reptile or amphibian surveys undertaken which may occur within semi-natural habitats on site, therefore a precautionary principle shall be adopted.

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Designated sites/Species/Habitats	Evaluation	Key Ecological Receptor (KER)	Rationale
<b>Fish</b>	Local importance (lower value)	No	No suitable habitat on or within the ZOI of the site.
<b>Invertebrates</b>	Local importance (lower value)	No	Limited suitable habitat on or within the ZOI of the site.
<b>Invasive species</b>	None	No	No invasive species were present on site.

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## 5.6 Likely and Significant Effects of the Proposed Development

As per the relevant guidelines, likely effects have been assessed for KERs only, as listed in Table 5-11. The following sections provide an assessment of the impact of the Proposed Development on local ecology. As per CIEEM (2018), where mitigation is fully integrated into the scheme and there is high confidence that it will be implemented the significance of effects of the mitigated project are assessed. Where mitigation has not been integrated into the scheme, for example where it is necessary to include specific measures within a Construction Environmental Management Plan (CEMP), the potential impacts are assessed in the absence of mitigation. The following is extracted from CIEEM (2018):

*“Presenting the results of the assessment ‘with’ and ‘without’ mitigation allows the need for mitigation and/or compensation to be clearly identified. Where mitigation is fully integrated into the scheme and there is high confidence that it will be implemented, it may be appropriate simply to assess the significance of effects of the mitigated project, with this assessment reflecting the likelihood of the incorporated measures being successful. Where there is any uncertainty, then the with/without mitigation approach to assessment described above should be used to ensure transparency”.*

### 5.6.1 Construction Phase

The Proposed Development will see a change in land use from an area dominated by hedgerows, treelines, forestry, and grassland to a quarry site.

The construction of the Proposed Development will involve site enabling works including clearance and excavation of materials, resulting in the loss of approximately 2.06ha of agricultural land and 4.49ha of commercial forestry. The extraction will result in local topographic changes with the removal of till overburden from the site. Approximately 158,928 m<sup>3</sup> of overburden to a depth c. 4 metres. A portion of this overburden will be utilised in the construction of berms surrounding the extraction area.

Potential Construction Phase impacts that could arise as a result of the Proposed Development include, but are not limited to, habitat loss or damage, habitat fragmentation, increases in noise and dust emissions, direct mortality or disturbance of protected species, runoff of sediment or other water borne pollutants into surface waterbodies and Designated sites located downstream or light pollution.

It is considered that any negative impacts arising as a result of the Proposed Development can be readily mitigated through avoidance measures, the use of standard best practice construction measures, and biodiversity enhancement measures that will be incorporated into the Proposed Development plan.

#### 5.6.1.1 Impacts on Designated sites

The ecological value of Designated sites, habitats, flora, and fauna associated with the site are evaluated in Table 5-11. This evaluation follows the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009) and CIEEM (2018). KERs are those ecological receptors for which detailed assessment is required, on the basis of ecological value and likely significant impacts. The rationale behind these evaluations is also

provided. Ecological resources of below 'Local Importance (higher value)' should not be selected as 'KER' for which detailed assessment is required (NRA,2009).

*The River Barrow and River Nore* SAC maintains a hydrological link to the site via the Baunleath stream which flows from the site and discharges into the Madlin River (roughly 1km north of the site).

There is the potential for the generation of suspended sediment in surface water runoff during the Construction Phase. Earthworks, the removal of vegetation and the stripping of soil/subsoil and the stockpiling of such material (berms surrounding the proposed extraction area, with all excess soil to be stored in the proposed soil storage area) which will be a potential source of sediment laden water. All excess surface water within the site will be directed to temporary settlement pond within the quarry void. The retention time within the settlement pond will be at least 24hrs and this will allow enough time to remove fine silts. After settlement, water will be directed to a roadside drain which in turn discharges into the Baunleath stream. Construction phase activities can result in the release of suspended solids to surface waters which could affect the water quality of downstream receptors including the Baunleath stream, the Madlin River and the *River Barrow and River Nore* SAC and their associated aquatic ecosystems. The pre-mitigation impact of suspended solids entrainment in downstream surface waters will be a negative, significant, indirect, temporary, likely impact. Details of the hydrological and hydrogeological impacts of the Proposed Development can be found in Chapter 7 of this EIAR.

#### **5.6.1.2 Impacts on Habitats**

As per Table 5-5, the following habitats were identified as KERs:

- WL1 - Hedgerows
- WL2- Treelines

##### **5.6.1.2.1 WL1 – Hedgerows and WL2 Treelines**

The Construction Phase of the Proposed Development will give rise to the loss of the majority of the vegetative habitat within the site, including WL1 and WL2 habitats. The proposals will aim to retain boundary treelines and hedgerows along the western, part of the northern, and part of the southernmost boundary of the site. Hedgerow and treeline habitats located along the roadway, access road, and along the northern boundary separating the site from the current active quarry to the north will not be retained and are to be replaced by screening berms. The loss of hedgerows and treelines within the site, represents a *negative, long-term, significant* impact at a local scale. A forestry screening is proposed to divide the soil storage area from the extraction area, but this represents only a fraction of the habitats currently in place (Figure 5-14).

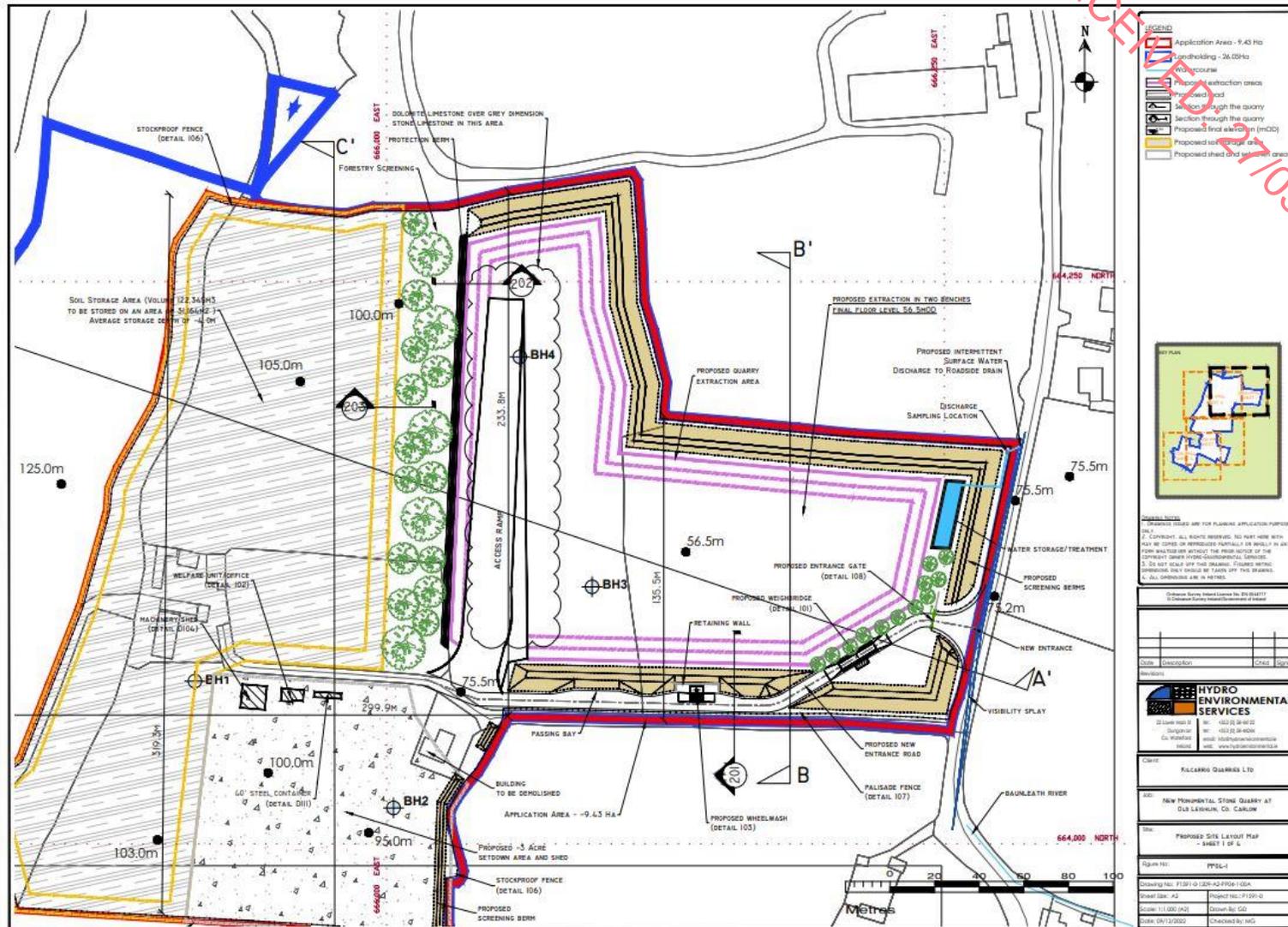


Figure 5-14 Drawing of Proposed Development site layout (Hydro environmental services, 2022)

### 5.6.1.3 Impacts on Fauna

#### 5.6.1.3.1 Mammals (Excl. bats)

The negative impacts to terrestrial mammals will be largely as a result of habitat clearance and disturbance. Common and widespread species such as pygmy shrew (*Sorex minutus*), Irish stoat (*Mustela erminea Hibernica*) and hedgehog (*Erinaceus europaeus*) may use the grassland and hedgerow habitat on site. Clearance of vegetation may put these species at risk of injury or death if present when clearance is taking place. This risk constitutes a potential, *negative, long-term, significant* impact on the local populations of these species.

Small mammal species such as hedgehog and badger have the potential to become entangled in construction materials such as netting and plastic sheeting, as well as other waste materials, causing entrapment and injury or death. This constitutes a *negative, short-term, significant* impact at a local scale.

Evidence of badger activity was found throughout the site, and badger activity was captured via the camera traps (Table 5-9). Badgers are protected species under national and international legislation in Ireland, and no actions may be carried out that may impact badger without a suitable license/consent being received from the NPWS. Active or inactive badger setts were not detected on the site, however, as per the limitations, portions of the site were inaccessible and may contain setts.

The excavation of any badger setts on site, in the absence of suitable surveys and mitigation, and exclusions of badgers if present, could lead to death or injury of badgers and would represent a *negative, permanent, significant* effect at the site scale, through the injury/death of members of a badger clan.

Sections of dense vegetation on site prevented absolute determination of the presence or absence of setts, these areas. The removal of these sections of vegetation in the absence of monitoring for badger represents a potential *negative, permanent, significant* impact should badger be present at the time. Should vegetation clearance take place within 10m of the active badger sett entrances this would represent a *negative, permanent, significant* impact on badger in the absence of mitigation.

Noise generated during the Construction Phase has the potential to cause a disturbance impact to badgers, in the absence of appropriate mitigation this constitutes a *negative, short-term, significant* impact at a local scale.

#### 5.6.1.3.2 Birds

The meadow, hedgerow and treeline habitats present have been deemed suitable or supporting a notable bird assemblage, therefore should vegetation be cleared or cut back during the breeding bird season (March 1<sup>st</sup> to August 31<sup>st</sup>); there is the potential for nesting birds to be harmed and nests to be destroyed. This would be in contravention of the Wildlife Act 1976 (as amended) which provides protection to breeding bird species and their nests and young. In the absence of mitigation or preventative measures, this risk constitutes a *negative, short-term, significant* impact on local bird populations. The loss of potential nesting and

foraging habitat at the site through the removal of vegetation represents a *negative, permanent, moderate* impact in the absence of suitable mitigation.

The increased noise and dust levels associated with the Construction Phase of the Proposed Development may have the potential to cause *negative, short-term, not significant* impacts on local bird populations. Increased human presence during the Construction Phase, in addition to increased lighting at the site also has the potential to cause *negative, short-term, not significant* disturbance to birds in the locality.

#### 5.6.1.3.3 Bats

There will be a loss of potentially high suitability foraging and commuting habitat for bats that reside within the vicinity of the site through the loss of treelines, hedgerows, and grasslands. The loss of commuting and foraging habitat for bats represents a *negative, short-term, significant* impact to local bats. This loss and fragmentation of habitat, along with an increased noise and light levels associated with human activity during the Construction Phase, represents a *negative, short-term, significant* impact on local bat species in the absence of mitigation.

Felling of trees and demolition of the buildings may place any roosting, breeding or hibernating bats present at risk of injury or death. This constitutes a *negative, long-term, significant* impact on bats at a local scale.

#### 5.6.1.3.4 Amphibians and Reptiles

The grassland and hedgerow habitats on site provide potential habitat for common lizard, smooth newt, and common frog. The clearance of grassland/hedgerow and associated understory could cause injury or death to reptiles should they be present during the clearance. In the absence of mitigation, this could constitute a *negative, short-term, significant* impact at a local scale.

The removal of potentially suitable habitats may place these species at risk of injury or death, as well as cause disturbance and/or displacement of these species from the site and general area. This constitutes a potential *negative, short-term, significant* impact to local populations of these species if present during construction works, in the absence of suitable mitigation.

### 5.6.2 Operational Phase

#### 5.6.2.1 Impacts on Designated sites

The potential effects on groundwater and surface water during the Operational Phase are greater during the Operational Phase in comparison to the Construction Phase. Therefore, the potential for the Operational Phase of the Proposed Development to affect the WFD status of waterbodies in the vicinity and downstream of the site is increased compared to the Construction Phase. During the Operational Phase runoff from the proposed extraction area will be directed to temporary settlement ponds on the quarry floor. En-route to the ponds, surface water will likely increase in turbidity due to the collection of sediment particles. Surface waters may also be contaminated with any leaked hydrocarbons on the quarry floor. This will reduce the quality of surface water runoff from the site and will have an adverse impact on

local downstream receiving watercourses (Baunleath stream, Madlin River, and River Barrow) and their associated aquatic ecosystems. The *River Barrow and River Nore SAC* is hydrologically connected to the site via the Baunleath stream. The Proposed Development has the potential to adversely impact both surface water and groundwater quantity and quality in the vicinity of the site. Therefore, the Proposed Development has the potential to adversely impact the qualifying interests of the *River Barrow and River Nore SAC*.

This phase of the Proposed Development will require the management of both minor groundwater inflows and surface water (from rainfall). The depth of extraction is well below the elevation of the local groundwater table, hence small groundwater inflows may occur. This will generate excess water on the quarry floor which will need to be discharged intermittently to allow for quarrying activities to continue. It is currently proposed to intermittently discharge excess surface water to a roadside drain located to the east of the site. This drain outfalls to the Baunleath stream.

The pre-mitigation impact on the River Barrow and River Nore SAC is considered to be *negative, slight, direct, unlikely, and short-term*. Please see Chapter 7 of this EIAR for further details on the hydrology/hydrogeology of the site, the associated predicted impacts, and recommendations regarding mitigation and monitoring.

#### **5.6.2.2 Impacts on Habitats and Flora**

Potential Operational Phase impacts that could arise as a result of the Proposed Development include, but are not limited to, disturbance or displacement of species as a result of quarrying activity, increased human presence and/or light, air, dust, and noise pollution. Chapter 8 of this EIAR further discusses impacts of the Proposed Development in detail.

The majority of vegetation at the site will not be retained, due to the nature of the Proposed Development. As described, vegetation will be stripped, and the quarry excavated. Topsoil will be preserved for the restoration plan stage. The impacts on local flora and fauna will be localised (i.e., only within the proposed extraction area). Impacts deemed reversible upon the successful application of the Restoration Plan as required by Carlow County Council as part of planning for quarry sites.

#### **5.6.2.3 Impacts on Mammals (Excl. bats)**

Noise, dust, and lighting disturbance associated with the Operational Phase has the potential to cause a *negative, permanent, moderate* impact to badger and small transient mammals in the absence of suitable mitigation.

#### **5.6.2.4 Impacts on Birds**

Noise and dust pollution associated with the Operational Phase of the Proposed Development has the potential to cause disturbance to local breeding bird population, carrying a risk of *negative, moderate, short-term* for those species.

### 5.6.2.5 Impacts on Bats

There is potential for a *negative, permanent, moderate* local impact on bats in the vicinity of the site via the increased noise, air pollution and lighting associated with the Operational Phase of the Proposed Development, in the absence of mitigation.

### 5.6.2.6 Impacts on Amphibians and Reptiles

No negative impacts on amphibians are anticipated during the Operational Phase of the Proposed Development. As the habitats for all species mentioned, including mammals, birds, bats and other species such as invertebrates and amphibians, will be removed during the Construction Phase, there will be no/negligible impacts during the Operational Phase.

### 5.6.3 Cumulative

Cumulative Impacts can be defined as “*impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project*”. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

If the Proposed Development and the existing or proposed projects or plans impact on the same KERs, there is potential to lead to cumulative impacts which could be of a higher level of significance. Generally, this applies to potential impacts on birds and small mammals due to the combined loss of nesting or foraging habitat in the locality of the site, and potential impacts on bats due to the combined loss of suitable foraging and commuting habitat in the locality.

There is an operational quarry located to the north of the site. Due to the proximity of the site to this existing quarry there is the potential for cumulative impacts to arise with regards to hydrology. Please see Chapter 7 of this EIAR for further details.

#### 5.6.3.1 Existing Planning Permissions

Plans and projects in the surrounding area that could have the potential to result in cumulative impacts were reviewed from data sources including:

- An Bord Pleanála website, <http://www.pleanala.ie/>.
- EIA Portal, as provided by the Department of Housing, Planning and Local Government  
<https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1>
- MyPlan.ie, as provided by the Department of Housing, Local Government and Heritage in conjunction with Irish Local Authorities. <https://myplan.ie/>

Any planning applications listed as granted or decision pending from within the last 5 years within a 5km radius were assessed for their potential to act in-combination with the Proposed

Development and cause likely significant effects. Long-term developments granted outside of this time period were also considered where applicable.

There are several existing granted planning permissions or in-progress developments on recorded in the area. However, these projects are small-scale in nature, such as small-scale extensions and alterations to existing residential properties, the construction of individual dwellings, and agricultural buildings.

Table 5-12 outlines the most significant project granted planning within the vicinity of the site.

*Table 5-12 Applications for Planning Permission within a 5km radius of the site*

Application Reg. Ref.	Address	Development Proposal	Decision
22238 Kilkenny Limestone Quarries Ltd	Old Leighlin Quarry, Bannagagole, Co. Carlow	The installation of a Roof Mounted Solar PV Panel Array consisting of up to 2200m <sup>2</sup> of solar panels with a peak capacity of up to 427.5Kwp mounted to the roofs of two industrial buildings via steel frames, including routing cable, trenching, and backfilling of cables and all associated works.	Grant Permission  Decision date: 29/11/2022

Due to the scale of works and the distance from this project to the site (Approx. 5km), the cumulative effects are deemed insignificant. As a result, it is considered that there are no potential combined environmental impacts from the Proposed Development in the vicinity of the site at the time of writing this report.

#### **5.6.4 “Do nothing” Impact**

If the Proposed Development were not to proceed, the Proposed Development site would remain as a greenfield site, continuing to be used for agriculture and forestry, and habitats would continue to evolve. The treelines and hedgerows would continue to provide foraging, roosting, and commuting habitat for birds, bats, and small mammals.

### **5.7 Avoidance, Remedial and Mitigation Measures**

#### **5.7.1 Construction Phase**

##### **5.7.1.1 Mitigation by Design**

The following mitigation by design is proposed:

- All plant and machinery will be serviced before being mobilised to site;
- Refuelling will be completed in a controlled manner using drip trays (bundled container trays) at all times; and
- Only designated trained operators will be authorised to refuel plant on site.

Procedures and contingency plans will be set up to deal with emergency accidents or spills.

### **5.7.1.2 Control and Management of Water and Surface Water Runoff**

Prior to the commencement of earthworks, silt fencing will be placed down gradient of the construction areas where surface water may drain towards the Baunleath stream and/or other small drainage ditches present within or adjacent the site. These silt fences will be embedded into the local soils to ensure all site water is captured and filtered.

Daily monitoring and inspections of runoff during the Construction Phase will be completed and should be detailed in a CEMP. Earthworks for the Construction Phase will take place during periods of low rainfall to reduce run-off and potential siltation of downstream watercourses.

The proposed water management system will direct surface water and any minor groundwater inflows in the site towards suitably designed settlement lagoons on the quarry floor. These lagoons will serve to attenuate discharge from the site and will ensure that discharge rates to the Baunleath stream do not exceed the existing greenfield runoff rates or the maximum permitted daily discharge volume as per the discharge license. Water from the wheel wash will be recycled and will not enter the settlement ponds or be discharge to the Baunleath stream.

Drainage controls within the Proposed Development will include the following:

A series of land drains are proposed below the soil storage area, and these drain to an open drain on the eastern edge of the soil storage area. Any drainage water and runoff arising from this area will be directed into the quarry void and managed via the quarry water management system.

- The setdown area will have a hardcore surface. Part of the setdown area also drains into the quarry void. The southern half of the setdown has bounding collection drains, and these will be filled with drainage stone (i.e., french drains), and any excess surface water arising from these French drains will discharge to ground via a proposed soakaway.
- Within the quarry void surface water and groundwater will be collected and pumped from temporary sumps to the main settlement pond. Water within the settlement pond will drain via gravity and flow through a hydrocarbon interceptor and then discharge to a drain at the northeastern corner of the proposed site. The drain flows via a culvert under the L3036 towards the Baunleath stream which in turn flows into the Madlin River further downstream. A discharge licence will be required for this proposed discharge.
- Drainage water from the main site access road will be collected in a roadside filter drain. Excess water from the filter drain will flow through a hydrocarbon interceptor and recharge to groundwater in a soakaway at the southeast of the site.
- Aco drains are proposed across the site entrance. The Aco drain closest to the entrance gate will drain into the filter drain/hydrocarbon interceptor/soakaway arrangement outlined in the previous paragraph. The second Aco drain prevents

runoff from the site entrance area onto the public road. This Aco drain direct water to the south into a french drain/linear soakaway located inside the site boundary.

The Proposed Development will require discharge of surface water and a small amount of groundwater as the proposed quarry void intersects the local groundwater table. Similar to the existing quarry (to the north), there is likely to be little groundwater inflows to the quarry except for water entering from the upper weathered bedrock.

### **5.7.1.3 Timing of Vegetation Clearance & Removal of Buildings**

Prior to vegetation removal and the removal of derelict buildings it is recommended that bird surveys and bat surveys are undertaken in adherence to best practice guidelines, the findings of which will be used to inform the below recommendations and can be implanted via a CEMP. Furthermore, the findings of the survey will be used to provide specific mitigation measures, including location and number of bird and bat boxes to be implemented.

#### **5.7.1.4 Birds**

To ensure compliance with the Wildlife Act 2000 as amended, the removal of areas of vegetation will not take place within the nesting bird season (March 1<sup>st</sup> to August 31<sup>st</sup> inclusive) to ensure that no significant impacts (i.e., nest/egg destruction, harm to juvenile birds) occur as a result of the Proposed Development. However, this shall be extended to include December, January and February due to conifer plantations being the preferred habitats for the winter nesting common crossbill (*Loxia curvirostra*). Where any removal of vegetation within this period is deemed unavoidable, a qualified ecologist will be instructed to survey the vegetation prior to any removal taking place, furthermore, this should include nocturnal surveys for owl species which may nest within the plantation woodland. Should nesting birds be found, then the area of habitat in question will be noted and suitably protected until the ecologist confirms the young have fledged.

#### **5.7.1.5 Terrestrial Mammals**

Information in relation to vegetation clearance and other suitable mitigation measures for terrestrial mammals, namely badger, are assess further in Section 5.7.1.8.3. below.

#### **5.7.1.6 Herptiles**

Any clearance of habitat likely to support reptiles or amphibians, for example removal meadow grassland, will be carried out with the following considerations:

- a) Habitat removal will be carried out in **September/October** to ensure that Lizards are active but also that nesting birds aren't impacted, (See Table 5-13 below).
- b) Should any suitable vegetation removal be required during this period, an ecologist will be consulted, and instruction taken on how to proceed.
- c) Any suitable vegetation removal (e.g., meadow grassland and hedgerows), if required in the active season, will be undertaken as detailed below.

- d) Any hibernacula encountered should be dismantled by hand during the reptile active season.

To ensure no adverse effect of any herptiles which may be present on site, a phased approach to clearance, under the supervision of an ecologist, will be used to allow wildlife to move from any suitable habitat that will be removed. This will take place during weather that is suitable for reptiles and amphibians to be active (above 10°C with little rain), during the main activity season (generally March to September inclusive):

- Phase 1 – Directional cutting vegetation to 150-200 mm and removing the arisings. This should be left for a minimum of 24 hr for any sheltering reptiles to disperse;
- Phase 2 – Hand-searching the cut areas (conducted by an ecologist) and removing any sheltering habitat (e.g., logs or debris) then cutting vegetation to ground level and removing the arisings; and
- Phase 3 – Soil scrape.

Should any suitable refugia (such as log piles) need to be removed, this will be undertaken outside the reptile gravid period and outside their hibernation period (September/October) and will be supervised by the ecologist.

Should above ground vegetation removal be required during winter when reptiles and amphibians are in torpor, it is advised the vegetation is removed to ground level, and all earth works is undertaken during the active season under a watching brief by a suitability experienced ecologist.

Table 5-13 provides guidance for when vegetation/habitat clearance is permissible. Information sources include Herpetological Society of Ireland, British Hedgehog Preservation Society's *Hedgehogs and Development and the Wildlife (Amendment) Act, 2000*, Collins (2016) and NRA (2009).

The optimal period for vegetation/habitat clearance for all species is within the months of **September and October**. Where this seasonal restriction cannot be observed, a check(s) will be carried out prior to any site clearance by an appropriately qualified ecologist/ornithologist and repeated as required to ensure compliance with legislative requirements.

Works will be undertaken in adherence to a detailed Method Statement for vegetation removal.

Table 5-13 Seasonal Restrictions on Vegetation Removal. Red Boxes Indicate Periods When Clearance / Works are Not Permissible

Ecological Feature	January	February	March	April	May	June	July	August	September	October	November	December
<b>Breeding Birds</b>	<p><u>Nesting bird season.</u> No clearance of vegetation unless confirmed to be devoid of nesting birds by an ecologist. <b>(Mar - Aug)</b></p>								<p>Vegetation clearance permissible <b>(Sept - Nov)</b></p>			
<b>Bats</b>	<p>Tree felling to be avoided unless confirmed to be devoid of bats by an ecologist. <b>(Jan - Aug)</b></p>								<p>Preferred period for tree-felling <b>(Sep - Oct)</b></p>		<p>Tree felling to be avoided unless confirmed to be devoid of bats by an ecologist <b>(Nov - Dec)</b></p>	
<b>Terrestrial Mammals (e.g., Hedgehog, Pygmy Shrew, stoat)</b>	<p><u>Mammal hibernation season.</u> No clearance of vegetation unless confirmed to be devoid of hibernating mammals by an ecologist. <b>(Jan - Mar)</b></p>			<p>Vegetation clearance permissible <b>(Apr - Oct)</b></p>						<p><u>Mammal hibernation season.</u> No clearance of vegetation unless confirmed to be devoid of hibernating mammals by an ecologist. <b>(Nov - Dec)</b></p>		
<b>Amphibians</b>	<p>Habitat clearance permissible <b>(Jan - Feb)</b></p>		<p><u>Amphibian breeding season</u> (estimated). No habitat destruction (Ponds, drainage ditches) unless confirmed to be devoid of tadpoles and other signs of amphibians. <b>(Mar - June)</b></p>				<p>Habitat clearance permissible if devoid of tadpoles and signs of amphibians <b>(July - Dec)</b></p>					

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Ecological Feature	January	February	March	April	May	June	July	August	September	October	November	December
<b>Common Lizard</b>	<u>Lizard Hibernation Season</u> No habitat clearance permissible (November – March)		<u>Active period</u> Habitat (Scrub, old stone walls) clearance permissible (Early March - October)							<u>Lizard Hibernation Season</u> No habitat clearance permissible (November – March)		

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**5.7.1.7 Invasive Species**

There were no high impact or legally controlled invasive plant species identified at the site during field surveys by Enviroguide Consulting. No Third Schedule invasive species were recorded on the site; therefore, no impacts from invasive species are anticipated. However, guidelines for best practice will be followed, as will the CEMP associated with the Proposed Development, to ensure no invasive species material will be brought on-site during construction.

**5.7.1.8 Protection of Fauna**

**5.7.1.8.1 Waste Management**

As best practice all construction-related rubbish on site e.g., plastic sheeting, netting etc. will be kept in a designated area and kept off ground level so as to prevent small mammals such as hedgehogs from entrapment and death.

**5.7.1.8.2 Log piles for Fauna**

Piles of logs and other woody vegetation arising from proposed vegetation removal will be left in suitable secluded corners/margins of the site; to provide habitat for common frog, lizards, and small mammals such as hedgehog and pygmy shrew. These areas of woody debris will also benefit local invertebrate species through provision of shelter and food sources.

**5.7.1.8.3 Protection of Badgers**

Transport Infrastructure Ireland’s (TII, previously the NRA) Guidelines for the treatment of badgers prior to the construction of national road schemes, was consulted in terms of the management of potential badger setts at the site. The following measures are taken from the guidance document and adapted to apply to the Proposed Development.

Prior to the commencement of construction works, a badger activity survey will be carried out by a suitably qualified badger specialist; to establish the current status and activity levels of potential badger setts (main, annex, subsidiary or outlier sett) if located on site. This may involve the further use of camera traps and other forms such as placing sand and sticks across any identified sett entrances to determine presence/absence. As badgers are known to be present on site and surrounding lands, a Method Statement will be prepared by a suitably qualified ecologist. Should an active badger sett be identified on site or within the ZOI, NPWS will be consulted prior to any works commencing and a derogation licence will be sought. It should be noted that badgers are able to excavate new sett's quickly, hence the requirement for a survey prior to commencement of construction. The accompanying Method Statement will detail any protection zones required to ensure the works do not undermine the setts (if present) or their tunnels, and the mitigation measures that will be required to protect badger for the extent of the Construction Phase (e.g., no works buffer zone, badger-proof fencing to prevent access to the site during works etc.).

Works close to an active badger sett or the removal of vegetation will only be conducted under the supervision of the suitably qualified ecologist under licence from the NPWS. During the breeding season (December to June inclusive), no works should be undertaken within 50m of active setts. Badger sett tunnel systems can extend up to 20m from sett entrances. As there is the possibility that tunnels would be destroyed by the movement of heavy plant over the ground above the tunnel system, it is essential that no heavy plant cross within 30m of a sett entrance. This will ensure that setts are not damaged and that badgers are not inadvertently crushed during construction. Lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance, light works such as digging by hand or scrub clearance will not take place within 10m of a sett entrance unless under the supervision of the ecologist.

#### *5.7.1.8.3.1 Plan for possible sett removal*

The retention of any discovered setts in-situ may be unfeasible due to spatial constraints and the footprint of the Proposed Development. As such, a suitably qualified ecologist would be instructed to prepare an exclusion plan for the decommissioning of any setts and their destruction once badgers have been confirmed to have vacated. The objective would be to allow the badgers to remain within their territory, even though a portion of their current territory will be lost as a result of the Proposed Development. The provision of an artificial sett within the site would also be incorporated into the landscape plan as detailed below, should badger setts be found prior to the commencement of the Construction Phase.

Any existing active setts would not be excluded or destroyed until the artificial replacement sett has been constructed, further details will be presented in the Method Statement and presented to the Local Planning Authority prior to commencement.

#### *5.7.1.8.3.2 Possible Exclusion of badgers from active setts*

Exclusion of badgers from any identified active setts would only be carried out during the period of July to November (inclusive) to avoid the badger breeding season. As per the TII guidelines, the removal of badgers from affected setts and subsequent destruction of these setts will only be conducted with NPWS permission/approval and by experienced ecologist. The exclusion process would include monitoring to ensure that badgers have fully evacuated the setts prior to destruction. The NPWS grant permission/approval to the experts undertaking

the badger operations and not to the development or contractor. A badger sett exclusion plan and Method Statement would be prepared and provided to the NPWS prior to commencement for their approval. No works will take place in the vicinity of the active setts or vegetation clearance without the supervision of the ecologist.

Measures to ensure the sett has been vacated and is devoid of all badgers will be designed by the badger specialist, involving a combination of:

- One-way badger proof gates on active entrances.
- Badger proof fencing.
- Soft and hard blocking of inactive entrances, and
- Recurring inspections.

Gates would be left installed, with regular inspections over a minimum period of 21 days before the sett could be deemed inactive. Any badger activity would require the procedures to be repeated or additional measures taken. No exclusion can commence in advance of the completion of the artificial sett. All sets should be assessed on a case-by-case basis by a suitably qualified experienced badger expert, with measures adapted to suit the situation as per the expert's direction.

#### 5.7.1.8.3.3 Possible Sett destruction

Sett destruction, if required, should commence immediately following the 21-day exclusion period, provided that all badgers have been excluded. Should a badger be discovered during this operation, the NPWS will be advised immediately, and all excavation will cease until it is agreed with the NPWS that it may continue. The destruction of a successfully evacuated badger sett may only be conducted under the supervision of qualified and experienced personnel with approval/permission from the NPWS. The possibility of badgers remaining within a sett must always be considered; suitable equipment should be available on hand to deal with badgers within the sett or any badgers injured during sett destruction.

TII guidelines recommend that sett destruction is usually undertaken with a tracked 12-25 ton excavator, commencing at ca. 25m from the outer sett entrance and working towards the centre of the sett, cutting ca. 0.5m slices in a trench to a depth of 2m. exposed tunnels may be checked for recent badger activity with full attention paid to safety requirements. A report detailing the evacuation procedures, sett excavation and destruction, and any other relevant issues will be prepared by the badger specialist and submitted to the NPWS.

#### 5.7.1.8.3.4 Artificial sett provision

An artificial main sett would be provided if an active sett needs to be removed to facilitate works (location determined by ecologist). See Figure 5-15 for example of proposed artificial sett).

A dense section of scrub vegetation (e.g., bramble, hawthorn, blackthorn) should be planted within the designated artificial sett area; the goal being to connect the sett with the boundary hedgerow and treelines and provide cover, shelter and protection for the badgers, maximising

the setts chances of being adopted. Wildlife friendly lighting would ensure an artificial sett is not illuminated.



*Figure 5-15 An example of an artificial sett under construction with pipe tunnels and 7 chambers (Extracted from NRA (now TII), 2005b)*

Potential recommendations for artificial sett construction and location are as follows (as per the guidance):

- Construction of an artificial sett must not place any existing setts in danger.
- All construction equipment must remain a minimum of 30m (up to 50m during breeding season) from all existing (naturally constructed) active sett entrances during the creation of the new sett.
- The artificial sett would need to be constructed several months in advance of the closure of the active setts, if required. In this interval, the affected badgers would be encouraged to utilise the artificial sett by means of attractive food baits (peanuts etc.) and materials from the active sett added to the new artificial sett (bedding, discarded spoil).
- The construction of an effective artificial sett is an exercise best conducted by experienced personnel.
- The constructed tunnels and chamber system would be located in well-drained soils and be landscaped and planted to ensure adequate cover and lack of disturbance.

#### *5.7.1.8.3.5 Potential Disturbance limitation*

In order to minimise the potential for disturbance of a new sett area and its surrounding vegetation, access to this portion of the site would be restricted and discouraged through landscaping (e.g., fencing, dense planting) and signage. Timing of works in the vicinity of an artificial sett will ensure any noisy or intrusive works required in this area take place prior to any artificial sett becoming active.

### 5.7.1.9 Protection of Bats

The derelict buildings, mature treeline and hedgerows found throughout the site will not be retained due to the scope of works. As all may provide suitable habitats for roosting, hibernating and/or breeding bats, mitigation measures must be put in place to minimize any potential disturbance to these species. It is also recommended that seasonal bat activity surveys are undertaken, in adherence to best practice guidelines, however, in the absence of survey the below mitigation is presented in adherence to the precautionary principle.

#### 5.7.1.9.1 Tree Felling

All trees within the site identified for removal to facilitate the proposed extraction works must firstly be surveyed by a qualified individual to assess their potential for roosting bats. Following assessment of their potential (whether there are adequate roost features etc.), best practice measures can be undertaken in their felling and/or further surveys undertaken.

This shall include the following survey effort for adversely effected trees, in adherence to current best practice guidelines:

- Trees with high potential roost features will be subject to 3 emergence surveys or aerial assessments. Should bats be observed using the roost, NPWS will be consulted, and a derogation licence would be required;
- Trees with moderate potential roost features will be subject to 2 emergence surveys or aerial assessments. Should bats be observed using the roost, NPWS will be consulted, and a derogation licence would be required;
- Trees with low potential roost features will be 'soft' felled via section or limbs being cut and lowered to the ground or the tree shall be felled and left in situ for 24 hours prior to sectioning; and
- Trees with negligible potential can be felled without consideration for bats.

Trees with high or moderate potential, not found to support bats when surveyed would be 'soft felled' as per the methods present on trees of low roost suitability.

Should bats be found during felling, works will be postponed until a derogation licence is obtained by the bat ecologist from the NPWS. This will avoid any harm to bats and the committing of an offence under The Wildlife Act 1976 as amended.

Should the condition of trees have deteriorated between the writing of this report and the receipt of grant of planning or a significant time elapsed i.e. one year, an updated roost assessment should be undertaken to ensure no significant alterations from the baseline.

Soft felling of vegetation will follow current best practice guidelines (as per NRA (Now TII) 2005 Guidelines):

- Tree-felling will be undertaken in the period September to late October. During this period bats are capable of flight and may avoid the risks of tree-felling if proper measures are undertaken.

- Tree-felling will be undertaken using heavy plant and chainsaw. Prior to felling the tree will be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active.
- The tree should then be pushed to the ground slowly.
- Trees will not be sawn up or mulched immediately. A period of at least 24 hours, and preferably 48 hours, will elapse prior to such operations to allow bats to escape.
- When felling trees with a chainsaw, it is important to ensure that the rate of fall is not accelerated by the use of a chain and vehicle (e.g., tractor). It is unlikely that a bat would survive such a heavy impact.

#### 5.7.1.9.2 Derelict Building Removal

Derelict buildings on site must firstly be assessed by a suitably qualified individual to determine their potential for bat activity and as bat roost sites.

To ensure no adverse effect on bats, it is recommended that a dusk/dawn emergence survey of the buildings is undertaken to current best practice guidelines (Collins, 2016). This will include one visit for buildings of low potential, two visits for buildings of moderate potential and three visits for buildings of high potential. This can be conducted between May and September, with at least one visit before August and surveys spaced a minimum of two weeks apart. The results of these surveys would be relied upon to inform further works. These can be divided into two probable outcomes;

1. No bats are recorded roosting within the structures and the building can be removed, this would likely require no further input from an ecologist, but it would be advisable to undertake works at the earliest convenience to prevent potential future occupation. Should works be delayed beyond 2023 an ecologist should be consulted to ensure no bats are in occupation, as bats are a transient species and will readily occupy suitable structures. In the unlikely event of any bats being found before or during the demolition, the works will stop, a bat specialist will be consulted, and a derogation licence may be required from the NPWS to continue works.
2. Should a bat roost be identified during the emergence surveys, a derogation licence will be required from NPWS prior to demolition works taking place. This is a legal requirement and can be applied for following planning permission being granted. The application process will likely take 8 to 12 weeks to process by NPWS. The NPWS ranger (or otherwise qualified person) will need to be on-site during demolition works should any bats be present. In the event of bats being present, demolition works should be carried out between late August and early November under licence, in order to ensure that a potentially breeding populations of bats are protected. During this period young bats are capable of flight and the breeding season should be over.

### 5.7.1.9.3 Bat Roosting Opportunities

To offset the loss of trees and other roosting features potentially on site, a series of bat boxes will be erected on suitably large trees along the boundaries of the site to provide future roosting opportunities. The guidance of a suitably qualified bat ecologist will be sought in the selection of bat box type and placement; to avoid disturbance from lighting generated by the Proposed Development and maximise the likelihood of their uptake by local bats. Bat boxes will be placed over 4m high (if possible) onto retained mature trees, the trees in which they are placed will not be illuminated. This will be detailed within a Method Statement or similar document for submission to the Planning Authority prior to commencement.

### 5.7.1.9.4 Bat Friendly Lighting Measures

In the absence of bat surveys and subject to grant of permission, the construction stage lighting plan will be prepared by the main contractor when they are appointed, and this will be reviewed by a bat ecologist to ensure that no significant night-time light spill on to the boundary treelines at the site occur as result of night-time security lighting or similar (if such lighting is required). Every effort will be made to ensure that there will be no night-time construction lighting within or directed into vegetated areas and treelines. To ensure there is no light spill into these areas, the following luminaire specifications, taken from latest guidance (ILP, 2018), will be adhered to during the Construction Phase:

- A bat ecologist (with lighting expertise) will assess the lighting report for the area containing trees which are identified as roosts e.g., the area containing trees T916 to T924 to ensure no lighting disturbance to roosts, or potential bat roost trees. They will advise further lighting mitigation as required.
- Retained treelines will not incur an increase in the current lux level due to the new development.
- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Column heights will be carefully considered to minimise light spill. The shortest column height allowed will be used where possible.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e., no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers.

- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

#### **5.7.1.10 Noise Disturbance**

Increases in disturbance levels as a direct result of human activity and through increased generation of noise during the Construction Phase can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing. To control likely noise impacts caused by the proposed external operations, mitigation measures as set out in *BS 5228-1: A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise* will be adopted:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoid unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Appointing a site representative responsible for matters relating to noise.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

These measures will ensure that any noise disturbance to nesting birds or any other fauna species in the vicinity of the site will be reduced to a minimum.

#### **5.7.1.11 Dust Disturbance**

The following general dust control measures will be followed for the duration of the Construction/Infill Phase of the Proposed Development and will ensure no significant dust related impacts occur to nearby sensitive receptors including local faunal species.

- In situations where the source of dust is within 25m of sensitive receptors screens (permeable or semi-permeable) will be erected.

- Haulage vehicles transporting gravel and other similar materials to site will be covered by a tarpaulin or similar.
- Access and exit of vehicles will be restricted to certain access/exit points.
- Vehicle speed restrictions of 20km/hr will be in place.
- Bowsers will be available during periods of dry weather throughout the Construction/Infill period.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bower will operate to ensure moisture content is high enough to increase the stability of the soil thereby reducing the amount of dust.
- Stockpiling of imported materials will be avoided where possible with imported materials ideally placed on site in their proposed location upon receipt with double handling avoided.
- Stockpiles will be stored in sheltered areas of the site, covered, and watered regularly or as needed if exposed during dry weather.
- Gravel should be used at site exit points to remove caked-on dirt from tyre tracks.
- Hard surfaced roads will be wet swept to remove any deposited materials.
- Unsurfaced roads will be restricted to essential traffic only.
- If required to control dust nuisance wheel-washing facilities will be located at the exit from the construction site.
- Dust production as a result of site activity will be minimised by regular cleaning of the site access roads using vacuum road sweepers and washers. Access roads should be cleaned at least 0.5km on either side of the approach roads to the access points.
- Public roads outside the site shall be regularly inspected for cleanliness, as a minimum daily, and cleaned as necessary. A road sweeper will be made available to ensure that public roads are kept free of debris.
- The frequency of cleaning will be determined by the site agent and is weather and activity dependent.
- The height of stockpiles will be kept to a minimum and slopes should be gentle to avoid windblown soil dust.
- The following will be dampened during dry weather:
  - Unpaved areas subject to traffic and wind;
  - Stockpiles; and

- Areas where there will be loading and unloading of dust-generating materials.
- Under no circumstances will wastewater from equipment, wheel or surface cleaning enter the *River Barrow and River Nore SAC*, via indirect water sources.

These measures will ensure that any dust disturbance to adjacent habitats, nesting birds or any other fauna species in the vicinity of the site will be reduced to a minimum.

## 5.7.2 Operational Phase

### 5.7.2.1 Operational Control and Management of Water Quality (Surface and Groundwater)

All quarrying activities at the site will operate within a site-specific protocol for extraction which will follow the current international best practice. Please see Chapter 7: Hydrology of this EIAR for further details.

Mitigation measures to protect groundwater quality will be implemented throughout the Operational Phase. The primary risks to groundwater quality result from hydrocarbon spills and leaks. The following mitigation measures will be implemented at the site.

- No refuelling or maintenance of operation vehicles or plant will take place within the extraction area;
- Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment;
- Refuelling will only occur at the designated fuel pad area, which will include an oil/fuel interceptor, from a mobile double skinned fuel bowser or equivalent;
- A spill kit will be kept beside the designated fuel pad area. The spill kit will contain fuel absorbent material, pads/mats and oil boom for use in the event of any accidental spill;
- Drip trays and fuel absorbent mats will be used during all refuelling operations;
- Onsite refuelling will be carried out by trained and competent personnel only;
- All plant and machinery will be serviced before been mobilized to site and regular leak inspections and fitness for purpose will be completed during the backfilling works;
- No substantial plant maintenance will be completed on site, any broken down plant will be removed from site to be fixed; and,
- The site will operate under a dedicated Environmental Management System.

With the implementation of the mitigation measures outlined above for the protection of surface and groundwater quality/quantity, the local waterbodies including the *River Barrow*

and River Nore SAC will not be affected by the Proposed Development during the Operational Phase.

### **5.7.2.2 Noise Disturbance**

Increases in disturbance levels as a direct result of human activity and through increased generation of noise during the Operational Phases can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing. To control likely noise impacts caused by the proposed external operations, mitigation measures as set out in BS 5228-1: A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise will be adopted:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoid unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Appointing a site representative responsible for matters relating to noise.

These measures will ensure that any noise disturbance to nesting birds or any other fauna species in the vicinity of the site during the Operational Phase will be reduced to a minimum.

### **5.7.2.3 Operational Dust Disturbance**

To minimise the potential of dust impacts occurring during the Operational Phase of the Proposed Development, a series of mitigation measures have been prepared:

- Rotary atomisers and water bowsers will be employed during dry weather and during any site preparation activities including overburden removal, excavation of works area, internal roads.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind and shorten the length of time for which material will be stockpiled.
- Regular spraying of material stockpiles and haul roads during dry and/or windy weather.

- Covering of loose loads of fine sized materials during transit.
- Regular use of a road sweeper unit on the site entrance road and at the site exit.
- A wheel wash will be employed for dust suppression to ensure dust is not transferred off the working site area.
- Daily visual observations will be made on fugitive dust levels; in the event of high dust levels, operations giving rise to such emissions will be ceased or curtailed.

These measures will ensure that any dust disturbance to neighbouring habitats, nesting birds or any other fauna species in the vicinity of the site will be reduced to a minimum.

#### **5.7.2.4 Restoration Plan**

Section 16.16.3 of the Carlow County Development Plan 2022-2028 requires a planning application for a quarry to include the implementation of a restoration plan following the cessation of the proposed extraction activities (Figure 5-16). The Restoration Plan Objectives are:

- Create a natural habitat throughout the site, which is one of the beneficial after uses proposed in the EPA Guidelines: 'Environmental Management in the Extractive Industry (2008)'.
  - On completion of all quarry activities, the following will be completed:
    - remove all remaining stone and materials from the storage/processing yard and place them in the base of the quarry void.
    - Leave the cleared areas for natural recolonisation.
    - All structures will be cleared and removed from site.
    - The quarry void will be left to naturally infill with groundwater, which will likely settle at around ~70m AOD.
    - Spoil material from the perimeter berms will be placed in the eastern section of the quarry void and will be used to create a gradual sloping shoreline, and also to place spoil on residual quarry benches to foster a variety of wildlife.
    - A Native Planting Mix is considered, with the following guidelines:
      - Hedging to be planted as a double staggered row, with plants within each row 40cm apart (i.e. 5 plants per m). Rows to be 0.5m apart.
      - Planting in same species groups of 5-10 and transplants to be supplied with spiral guards.
      - Planting mix should be equal amounts of Silver Birch, Hawthorn, Blackhorn, Sally and Rowan.
      - Also, Gorse (*Ulex europaeus*) will be encouraged to grow on the elevated section along the western boundary and on the soil storage area. This may colonise naturally and will also be introduced via seed. Most of the northern, western and south-eastern existing hedgerows are kept within the Proposed Development. This is fundamental to

mitigate the visual impacts from most of the visual receptors identified in Chapter 10, of this EIAR.

The installation of the new green structure will compensate for the existing vegetation that will be removed. The new plantations are placed along the different slopes, creating a "green wall" that will mitigate, in the medium-term, the visual impacts of the Proposed Development. Please see Chapter 10 of this EIAR for further details.

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### 5.7.3 “Worst Case” Scenario

In the ‘worst case’ scenario at the site of the Proposed Development, where the recommendations and mitigation measures described in this report were to be disregarded or should fail; vegetation would be cleared during the nesting bird/roosting bat season, badger setts and small mammal/lizard hibernation season causing the destruction of protected species during the clearance works. Another ‘worst case’ scenario could see the accidental release of contaminated surface water with potential impact on the receiving water environment or accidental fuel release from the on-site plant and release to the groundwater body. Sediment and pollutants could potentially cause negative effects downstream, impacting on ecological sensitivities.

This scenario would only occur in the event of the failure of the surface water management and treatment measures that are included in the Proposed Development design, or the failure of the set of proposed mitigatory measures recommended in this report.

## 5.8 Residual Impacts

Residual impacts are defined as ‘*effects that are predicted to remain after all assessments and mitigation measures*’. They are the remaining ‘environmental costs’ of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment. Table 5-14 provides a summary of the impact assessment for the identified KERs and details the nature of the impacts identified, mitigation proposed and the classification of any residual impacts.

All mitigation measures detailed in this Chapter will be implemented in full and will remain effective throughout the lifetime of the facility. Therefore, negative impacts will occur on local ecology during the operation of the quarry but are likely to be reversible once the quarry is appropriately managed and the restoration plan implemented following cessation of quarrying activities.

Table 5-14 Summary of Potential Impacts of KER(s), Mitigation Measures/Mitigating Factors and Residual Impacts

Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation/ Compensation/ Enhancement measures; Mitigating Factors	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
<b>Designated sites</b>								
<b>River Barrow and River Nore SAC</b>	International importance (higher value)	The site is hydrologically connected with the <i>River Barrow and River Nore SAC</i> via the Baunleath stream which flows from the site and discharges into the Madlin River (roughly 1km north of the site).	Negative	Localised	Short-term	Insignificant	Mitigation measures and management plans re: hydrology and hydrogeology of site detailed in Section 5.7.1.2 of this chapter and in Chapter 7 of this EIAR.	Deemed insignificant due to nature, scale, and duration of Proposed works.
<b>Habitats</b>								
<b>Hedgerows (WL1) and Treelines (WL2),</b>	Local Importance (higher value)	Loss of hedgerow and treeline (and associated microhabitats) as a	Negative	Localised	Long-term	Significant	Vegetation will be removed on a phased basis. New planting at the end of the Operational Phase. Hedgerows along the western and south-eastern	Moderate, Long-term, Negative but Reversible

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Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation/ Compensation/ Enhancement measures; Mitigating Factors	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
		result of Proposed Development.					and part of the northern portion of the site to be retained. Please see Chapter 10 of this EIAR for details of planting.  Restoration Plan to be implemented following Operation Phase	
<b>Fauna</b>								
<b>Small mammals</b>	Local Importance (higher value)	Risk of injury and/or death as a result of vegetation clearance works.  Loss of suitable habitat.	Negative	Localised	Short-term	Significant	Clearing of vegetation (i.e. hedgerows, scrub) outside of hibernation period  (Outside period November - March).  Phased removal of vegetation on site.	Slight, Long-term, Negative but Reversible

Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation/ Compensation/ Enhancement measures; Mitigating Factors	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
							<p>Range of best practise construction and operational noise control measures to be put in place for the duration of the project.</p> <p>Restoration Plan to be implemented following Operation Phase</p>	
<b>Badger</b>	Local Importance (higher value)	<p>Potential sett removal/disturbance</p> <p>Reduction in potential foraging habitat due to the proposed works.</p>	Negative	Localised	Permanent	Very Significant	<p>Phased removal of vegetation on site with a preclearance survey prior to the removal of significant amount of vegetation.</p> <p>Pre-clearance badger surveys 8-12 weeks prior to the removal of scrub and hedgerow habitat on site.</p>	Slight, Long-term, Negative but Reversible

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Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation/ Compensation/ Enhancement measures; Mitigating Factors	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
		Noise disturbance during the Construction Phase.  Noise disturbance during the Operational Phase.					Construction of artificial sett if required.  Range of best practise construction and operational noise control measures to be put in place for the duration of the project.  Restoration Plan to be implemented following Operation Phase	
<b>Bird assemblage</b>	Local importance (higher value)	Loss of nesting/foraging habitat (hedgerows, woddland, grassland)  Harm/mortality due to vegetation removal	Negative	Localised	Long-term	Moderate	Breeding bird surveys to be undertaken by suitability qualified ecologist prior to works being undertaken.  All vegetative habitats outside of the area of the proposed	Moderate, Long-term, Negative but Reversible

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Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation			Proposed Mitigation/ Compensation/ Enhancement measures; Mitigating Factors	Residual Impact
			Quality	Magnitude / Extent	Duration		
		<p>during the breeding bird season.</p> <p>Disturbance due to noise and dust generated Proposed Development.</p>				<p>extraction works and along the margins of the site will be retained where possible, where clearance in required a phased approach will be applied.</p> <p>No removal of vegetation to be carried out during nesting season. If removal is unavoidable during this period, an Ecologist to survey the habitat in question and protected until the Ecologist confirms the young have fledged.</p> <p>Range of best practise construction and operational noise control measures to be put in place for the duration of the Construction Phase and</p>	

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Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation/ Compensation/ Enhancement measures; Mitigating Factors	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
							Operational Phase respectively.  Placement of numerous nest boxes within suitable habitat being retained, as guided by the ecologist  Restoration Plan to be implemented following Operation Phase	
<b>Bat Assemblage</b>	Local importance (higher value)	Loss of commuting, roosting, and foraging habitat (hedgerow, vacant building, grassland).  Potential for injury/mortality during tree-felling of roost potential trees.	Negative	Localised	Long-term	Significant	Bat emergence/aerial assessment, and bat activity surveys to be undertaken by suitably qualified individual prior to works being undertaken and to inform a potential licence application.  Soft-felling of trees identified for removal with suitable roost features but no bats present	Moderate, Long-term, Negative but Reversible

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Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation/ Compensation/ Enhancement measures; Mitigating Factors	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
		Disturbance due to light generated during the Construction and Operational Phases.					<p>NPWS derogation licence for any features where bats are present.</p> <p>Wildlife friendly lighting measures and bat box scheme as outlined in section 5.7.1.9.4</p> <p>Restoration Plan to be implemented following Operation Phase</p>	
<b>Amphibians and Reptiles</b>	Local Importance (higher value)	<p>Physical disturbance and loss of potential habitat at the site (grassland, hedgerow).</p> <p>Injury/death of lizards if present in stone walls to be cleared.</p>	Negative	Localised	Long-term	Significant	<p>Phased removal of vegetation as detailed in CEMP/Method Statement.</p> <p>Range of surface water protection measures as outlined in section 5.7.1.2</p> <p>Creation of suitable habitat features, e.g., log piles.</p>	Slight, Long-term, Negative but Reversible

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Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation			Proposed Mitigation/ Compensation/ Enhancement measures; Mitigating Factors	Residual Impact
			Quality	Magnitude / Extent	Duration		
						Restoration Plan to be implemented following Operation Phase	

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## 5.9 Monitoring

### 5.9.1 Construction Phase

#### 5.9.1.1 *Surface Water Protection*

Regular monitoring will be carried out by the contractor to ensure water quality protection measures (e.g., drain blocks), silt fences are working throughout the entire Construction Phase. All containment and treatment facilities will be maintained and inspected regularly based on site and weather conditions for any signs of contamination of excessive silt deposits and records of these checks will be maintained for inspection. The approach and frequency of checks will be determined before construction commences and should be agreed with the Local Planning Authority.

#### 5.9.1.2 *Dust, Noise and Light*

Regular on-site and off-site inspections will be undertaken where receptors are nearby, to monitor dust, noise, and light levels. The frequency and approach will be detailed in a CEMP. Regular site inspections will be carried out to monitor compliance with the CEMP, and all inspection results will be recorded. The inspection log will be created and made available to the local authority if requested. There will be an increase in the frequency of site inspections by the person accountable for air quality and dust issues on-site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

### 5.9.2 Operational Phase

The following will be checked/monitored during the Operational Phase, the details of which are to be included with the CEMP and/or BMP:

- Noise levels in the surrounding area;
- Implementation of lighting plan;
- Installation of and location of nest boxes;
- Installation of an artificial badger sett (if required);
- Implementation of Biodiversity Monitoring Plan
- Air quality (as determined within CEMP).
- Water quality (as determined within CEMP).

## 5.10 Interactions

This chapter pertaining to the ecological and biodiversity aspects of the Proposed Development, has the potential to interact with aspects of the following chapters of this EIAR:

- Chapter 6: Land and Soil

- Chapter 7: Hydrology
- Chapter 8: Air Quality and Climate
- Chapter 9: Noise and Vibration
- Chapter 10: Landscape and Visual Assessment
- Chapter 12: Material Assets

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### **5.10.1 Land and Soil**

An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment; with emphasis on the impact of the Proposed Development on the receiving soils underlying the site during the Operational Phases of the Proposed Development, is described in Chapter 6 - 'Land and Soil' of this EIAR. These impacts are considered to be relevant to the ecological sensitivities associated with the site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are described in full in Chapter 6. The bulk removal of soils, sands and gravel at the site can have implications for biodiversity. Natural regeneration of native and local seeds is the preferred option for re-vegetating areas to be retained for biodiversity.

### **5.10.2 Hydrology**

The key environmental interaction with biodiversity is water. An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is described in Chapter 7 - 'Hydrology' of this report as well as in this Chapter, to ensure the quality (pollution and sedimentation) and quantity (surface water run-off) of water is of appropriate standard. Interactions between hydrology and biodiversity can occur through impacts to water quality, arising, for example from an accidental pollution event during the Construction and Operational Phase. This interaction has the potential to result in impacts on habitats and fauna that are hydrologically linked to the site.

### **5.10.3 Air Quality and Climate**

An assessment of the potential impact of the Proposed Development on air quality and climate is included in Chapter 8 of this EIAR. Dust emissions arising from the Construction Phase of the Proposed Development were identified as having potential impacts on local biodiversity. Once dust minimisation measures are implemented, impacts to biodiversity are not predicted to be significant.

### **5.10.4 Noise and Vibrations**

An assessment of the potential impact of the Proposed Development in the form of excess noise and vibrations associated with the Proposed Works are laid out in Chapter 9 - 'Noise and Vibrations'. These impacts are considered to be relevant to the ecological sensitivities associated with the site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are both referenced in this Chapter and described in full in Chapter 9. There is potential for interactions between noise and

sensitive fauna, e.g., birds, that occur in adjacent habitats from increased noise levels during the Construction Phase. However, as described, noise related impacts are not deemed to be significant.

### 5.10.5 Landscape and Visual Assessment

An assessment of the potential impacts of the Proposed Development on the surrounding landscape character is outlined in Chapter 10 – Landscape and Visual. These impacts are considered to be relevant to the ecological sensitivities associated with the site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are both referenced in this Chapter and described in full in Chapter 10. Landscaping at a development site can have significant implications for biodiversity. Significant negative effects are not predicted.

### 5.10.6 Material Assets

Construction waste arising from site operations could negatively affect local fauna through entrapment, for example. However, appropriate waste management practices on site will ensure no significant effects occur on local biodiversity.

## 5.11 References

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