5 Biodiversity

5.1 Introduction

This chapter provides an Ecological Impact Assessment (EcIA) which addresses the potential ecological impacts that may occur in the future on the terrestrial, avian and aquatic ecology of a Proposed Development at Moneylane, Arklow, County Wicklow, and its surrounding environs.

This report has been undertaken in accordance with the guidelines issued by the Environmental Protection Agency (EPA) and the Chartered Institute of Ecology and Environmental Management (CIEEM).

It follows a standard approach based upon the description of the existing baseline conditions within the Proposed Development site. An evaluation of the likely habitats and species currently present within the Proposed Development site is also given, along with the identification of the potential ecological impacts arising from the construction and operation of the Proposed Development. An assessment of the likely significance of the identified impacts on Valued Ecological Receptors (VERs), both within and close to the Proposed Development site is also made. Where a significant negative impact has been identified, suitable remedial mitigation measures are provided in order to prevent, reduce, or offset the impact.

The main objectives of this ecological assessment were:

- Undertake a desktop review of existing baseline ecological data for the Proposed Development site and the wider area, including European and National sites of biodiversity importance within the Zone of Influence of the Proposed Development site.
- Undertake a field survey of the receiving environment.
- Evaluate the features of biodiversity value within the Proposed Development site and within the Zone of Influence of the Proposed Development site.
- Evaluate the potential negative impacts of the Proposed Development site on features of biodiversity value within the Proposed Development site and its Zone of Influence.
- Evaluate potential significant effects upon European or National sites.
- Consider measures to mitigate the potential negative impact(s) of the project on the ecology of the receiving environment.

5.1.1 Legislative and Policy Context

The Irish Wildlife Act 1976 (and its amendment of 2000) provides protection to most wild birds and animals. Interference with such species can only occur under licence. Under the act it is an offence to “wilfully interfere with or destroy the breeding place or resting place of any protected wild animal”. The basic designation for wildlife is the Natural Heritage Area (NHA). This is an area considered important for the habitats present or which holds species of plants and animals whose habitat needs protection. Under the Wildlife Amendment Act (2000) NHAs are legally protected from damage. NHAs are not part of the Natura 2000 network and so the Appropriate Assessment process does not apply to them.

The Flora Protection Order 1999 provides statutory protection in Ireland to a number of rare plant species from being wilfully cut, picked, uprooted or damaged. It is also illegal under this order to alter, damage or interfere with their habitats.

The Birds Directive (Council Directive2009/147/EC) recognises that certain species of birds

should be subject to special conservation measures concerning their habitats. The Directive requires that Member States take measures to classify the most suitable areas as Special Protection Areas (SPAs) for the conversation of bird species listed in Annex 1 of the Directive. SPAs are selected for bird species (listed in Annex I of the Birds Directive), that are regularly occurring populations of migratory bird species, and the SPA areas are of international importance for these migratory birds.

The EU Habitats Directive (92/43/EEC) requires that Member States designate and ensure that particular protection is given to sites (Special Areas of Conservation) which are made up of or support particular habitats and species listed in annexes to this Directive.

The Water Framework Directive (WFD) (2000/60/EC), which came into force in December 2000, establishes a framework for community action in the field of water policy. The overall aim of the WFD is the eventual achievement of good status in all waterbodies. The WFD was transposed into Irish law by the European Communities (Water Policy) Regulations 2003 (S.I. 722 of 2003). The WFD rationalises and updates existing legislation and provides for water management on the basis of River Basin Districts (RBDs). RBDs are essentially administrative areas for coordinated water management and are comprised of multiple river basins (or catchments), with cross-border basins (i.e. those covering the territory of more than one Member State) assigned to an international RBD. Ireland is now within the 3rd cycle of the WFD (2022 – 2027).

5.1.2 Planning Policies

National

Nationally, the Government's commitment to sustainable development is set out in a number of documents including the National Planning Framework and the National Development Plan 2018 – 2027.

Regional

Planning at the regional level is now guided by the Regional Spatial and Economic Strategy (RSES). The RSES is a strategic plan which identifies regional assets, opportunities and pressures and provides appropriate policy responses in the form of Regional Policy Objectives.

Local

Planning policy at the local level is currently provided by the Arklow Local Area Plan 2018-2024 Strategic Environmental Assessment (SEA) Statement and Wicklow County Development Plan 2018-2022. This plan contains a number of objectives and Development Management Requirements relevant to ecology, biodiversity, and nature conservation. Relevant to a range of habitats and environments present in Wicklow, special attention has been given to woodlands, trees and hedgerows, as well as waterways. These are summarised in **Table 5.1**.

Table 5.1: Policy Objectives as per the Arklow Local Area Plan 2018-2024	
Policy No:	**Biodiversity Policy Objectives**
NH1	To ensure that the impact of new developments on biodiversity is minimised and to require measures for the protection and enhancement of biodiversity in all proposals for large developments.
NH2	No projects giving rise to significant cumulative, direct, indirect or secondary impacts on Natura 2000 sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this plan (either individually or in combination with other plans or projects
NH3	To contribute, as appropriate, towards the protection of designated ecological sites including candidate Special Areas of Conservation (cSACs) and Special Protection Areas (SPAs); Wildlife Sites (including proposed Natural Heritage Areas); Salmonid Waters; Flora Protection Order sites; Wildfowl Sanctuaries (see S.I. 192 of 1979); Freshwater Pearl Mussel catchments; and Tree Preservation Orders (TPOs). To contribute towards compliance with relevant EU Environmental Directives and applicable National Legislation, Policies, Plans and Guidelines.
NH4	All projects and plans arising from this plan (including any associated improvement works or associated infrastructure) will be screened for the need to undertake Appropriate Assessment under Article 6 of the Habitats Directive. A plan or project will only be authorised after the competent authority has ascertained, based on scientific evidence, Screening for Appropriate Assessment, and a Stage 2 Appropriate Assessment where necessary, that: 1) The Plan or project will not give rise to significant adverse direct, indirect or secondary effects on the integrity of any European site (either individually or in combination with other plans or projects); or 2) The Plan or project will have significant adverse effects on the integrity of any European site (that does not host a priority natural habitat type and / or a priority species) but there are no alternative solutions, and the plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000; or 3) The Plan or project will have a significant adverse effect on the integrity of any European site (that hosts a natural habitat type and/or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons for overriding public interest, restricted to reasons of human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000.
NH5	To maintain the conservation value of all proposed and future Natural Heritage Areas (NHAs) and to protect other designated ecological sites in Wicklow.
NH6	Ensure ecological impact assessment is carried out for any proposed development likely to have a significant impact on proposed Natural Heritage Areas (pNHAs), Natural Heritage Areas (NHAs), Statutory Nature Reserves, Refuges for Fauna, Annex I habitats, or rare and threatened species including those species protected by law and their habitats. Ensure appropriate avoidance and mitigation measures are incorporated into development proposals as part of any ecological impact assessment.

NH7	The Council recognises the natural heritage and amenity value of the Wicklow Mountains National Park and shall consult at all times with National Park management regarding any developments likely to impact upon the conservation value of the park, or on issues regarding visitor areas.
NH8	To protect non-designated sites from inappropriate development, ensuring that ecological impact assessment is carried out for any proposed development likely to have a significant impact on locally important natural habitats or wildlife corridors. Ensure appropriate avoidance and mitigation measures are incorporated into development proposals as part of any ecological impact assessment.
NH9	To support, as appropriate, relevant public bodies (such as the National Parks and Wildlife Service), efforts to seek to control and manage alien / invasive species within the County.
NH10	To facilitate, in co-operation with the relevant statutory authorities and other groups, the identification of valuable or vulnerable habitats of local or regional importance, not otherwise protected by legislation.
NH11	To support the Department of the Arts, Heritage, Regional, Rural and Gaeltacht Affairs and the National Parks and Wildlife Service in the development of site-specific conservation objectives (SSCOs).
NH12	To support the protection and enhancement of biodiversity and ecological connectivity within the plan area in accordance with Article 10 of the Habitats Directive, including linear landscape features like watercourses(rivers, streams, canals, ponds, drainage channels, etc), woodlands, trees, hedgerows, road and railway margins, semi-natural grasslands, natural springs, wetlands, stonewalls, geological and geo-morphological systems, features which act as stepping stones, such as marshes and woodlands, other landscape features and associated wildlife where these form part of the ecological network and/or may be considered as ecological corridors or stepping stones that taken as a whole help to improve the coherence of the Natura 2000 network in Wicklow.
NH13	To preserve lands at ‘The Rocks’, Kilcoole (as shown on Map 10.16) in its existing state; to allow no development of these lands; to protect the lands as a natural habitat and biodiversity area; to protect the open nature and landscape quality of the lands.
NH14	To promote the preservation of trees, groups of trees or woodlands in particular native tree species, and those trees associated with demesne planting, in the interest of amenity or the environmental, as set out in Schedule 10.08 and Map 10.08 A, B & C of this plan.
NH15	To consider the making of Tree Preservation Orders (TPOs) to protect trees and woodlands of high value, where it appears that they are in danger of being felled.
NH16	Development that requires the felling of mature trees of environmental and/or amenity value, even though they may not have a TPO in place, will be discouraged.
NH17	To discourage the felling of mature trees to facilitate development and encourage tree surgery rather than felling where possible.
NH18	To encourage the preservation and enhancement of native and semi-natural woodlands, groups of trees and individual trees, as part of the development management process, and require the planting of native, and appropriate local characteristic species, in all new developments.
NH19	To encourage the retention, wherever possible, of hedgerows and other distinctive boundary treatment in the County. Where removal of a hedgerow, stone wall or other distinctive boundary treatment is unavoidable, provision of the same type of boundary will be required of similar length and set back within the site in advance of the commencement of construction works on the site (unless otherwise agreed by the Planning Authority).
NH20	To facilitate the implementation of the EU Water Framework Directive and associated River Basin and Sub-Basin Management Plans and the EU Groundwater Directive to ensure the

	protection, improvement and sustainable use of all waters in the County, including rivers, lakes, ground water, coastal and estuarine waters, and to restrict development likely to lead to a deterioration in water quality.
NH21	To resist development that would interfere with the natural water cycle to a degree that would interfere with the survival and stability of natural habitats.
NH22	To prevent development that would pollute water bodies and in particular, to regulate the installation of effluent disposal systems in the vicinity of water bodies that provide drinking water or development that would exacerbate existing underlying water contamination.
NH23	To minimise alterations or interference with river / stream beds, banks and channels, except for reasons of overriding public health and safety (e.g. to reduce risk of flooding); a buffer of generally 10m along watercourses should be provided (or other width, as determined by the Planning Authority) free from inappropriate development, with undeveloped riparian vegetation strips, wetlands and floodplains generally being retained in as natural a state as possible. In all cases where works are being carried out, to have regard to Regional Fisheries Board "Requirements for the protection of fisheries habitat during the construction and development works at river sites".
NH24	To ensure that any development or activity with the potential to impact on ground water has regard to the GSI Groundwater Protection Scheme.

5.1.2.1 Heritage Plans

Ireland's National Biodiversity Plan identifies actions that need to be taken in order to understand and protect biodiversity in Ireland. It states that biodiversity and ecosystems in Ireland should be conserved and restored, to deliver benefits that are essential to all sectors of society and that Ireland should contribute to the efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally.

Previous Wicklow County Heritage and Biodiversity Plans identified a number of objectives and policies in order to protect the natural heritage and biodiversity of County Wicklow, which are considered.

5.2 Consultation

ORS have been commissioned to assess the potential impacts of the Proposed Development in terms of Biodiversity during the construction and operational phases.

The principal members of the ORS EIA team involved in this assessment include the following persons:

- **Project Scientist & Lead Author:**
  Larry Manning – B.Sc. (Hons) (Applied Freshwater and Marine Biology). Current Role: Senior Ecologist. Experience *ca*. 3 years.

- **Project Scientist & Reviewer:**
  Luke Martin – B.A. (MOD) (Natural Sciences), M.Sc. (Sustainable Energy and Green Technology), CEnv, MIEnvSc. Current Role: Chartered Environmental Consultant. Experience *ca.* 12 years.

- **Project Coordinator & Reviewer:**

Oisín Doherty – B.Sc. (Geography with Environmental Science), MSc. (Environmental Management), CEnv, MIEnvSc. Current Role: Chartered Environmental Consultant. Experience *ca.* 14 years.

Consultation between ORS and other members of the planning/design team was made in order to obtain information required to assess the potential construction and operational phase impacts on biodiversity.

5.3 Methodology

5.3.1 Statement of Competence

This Biodiversity chapter for EIAR was carried out by Larry Manning BSc (Hons). Larry has an honours degree in Applied Freshwater and Biology from GMIT (ATU) Galway, where he gained an education in ecology and environmental management. Larry has worked on a wide variety of ecological assessments and habitat/species management surveys, including working as a consultant Marine Mammal Observer (MMO) for the Irish Whale and Dolphin Group Consulting, taking a lead role in marine engineering projects and overseeing regulatory compliance. He has extensive experience in the field of fisheries monitoring and research both in North Atlantic waters and in Antarctic waters for CAMMLR representing the South Georgia and South Sandwich Islands government.

The author has worked as a fisheries scientist for the Marine Institute since 2017 on research projects, species management plans, and fisheries species-specific population analysis. While working in the Fisheries Ecosystem Advisory Service at the Marine Institute, Larry engaged with the fishing fleet directly while data gathering at sea on trawlers and played a vital role in gathering sensitive data pertaining to national catch quotas and landings obligations, relevant to current regulations. Larry also has experience in implementing company strategy for offshore aerial surveys and hydrographic and geophysical surveys in line with current legislation for Offshore windfarm development. During seismic surveys the author was employed as an offshore fisheries liaison officer which required in depth knowledge of regulatory frameworks to ensure the fishing fleet, the survey company, and the ships officers of the watch were all compliant and safe during highly complex and dynamic operations. The author also works as an ornithologist and provides habitat and species assessments for terrestrial infrastructure developments.

Larry has extensive experience in delivering Appropriate Assessment Screenings, Natura Impact Statements, Ecological Impact Assessments, Environmental Impact Assessment Screenings and Biodiversity Chapters for EIARs.

5.3.2 Study Area

The study area encompasses all the land within the area defined in the plan submitted for planning consent, i.e., the Proposed Development site. In addition, important ecological habitats and receptors within the Zone of Influence of the Proposed Development site were also studied.

5.3.3 Desk Based Studies

The desk study involved the examination of aerial photographs, current and historical maps and plans and drawings of the Proposed Development site. In addition, information was collated on designated Natura 2000 sites within the Zone of Influence of the Proposed Development site and on protected and rare species within the 1km square of the site.

The following websites were used to access information and data:

- National Parks and Wildlife Service – www.npws.ie. Information held by NPWS on protected species within the Zone of Influence of the Proposed Development site was queried.
- National Biodiversity Data Centre – www.biodiversitycentre.ie. Data was gathered on rare, protected or threatened species located within the Zone of Influence of the Proposed Development site.
- Ordinance Survey Ireland – www.osi.ie. Current and historical maps, along with aerial photographs to ascertain current and past land-use and potential habitats within the Proposed Development site and surrounding lands.
- My Plan – www.myplan.ie – Additional mapping information.
- Google Maps & Street View – maps.google.ie – Aerial photographs.
- Topographical Map of Ireland – topographic-map.com – Topography.
- Environmental Protection Ireland – www.epa.ie.The EPA Appropriate Assessment tool was used to gather information on Natura 2000 sites within the Zone of Influence of the Proposed Development site. Information on Water Quality was also obtained from this site. The SEA tool was used to gather flood risk information.
- Wicklow County Council Planning – Information pertaining to planning history in the area and other plans and projects to allow an assessment of the potential cumulative impacts.

5.3.4 Field Based Studies

A visit to the Proposed Development site at Moneylane, Arklow, County Wicklow was conducted on November 1st, 2024, when relevant field notes, species lists and photographs were taken. The habitats within the Proposed Development site were identified and classified according to 'A Guide to Habitats in Ireland' (Fossitt, 2000). Plant species present in each habitat type were recorded. Habitats were assessed for their potential to be protected habitats under Annex I of the EU Habitats Directive (92/43/EEC) and for their capacity to support rare, threatened, and endangered species.

The habitat mapping exercise had regard to the 'Best Practice Guidance for Habitat Survey and Mapping' (*Smith et al., 2011*) published by the Heritage Council. Scientific and common names for plants follow *Parnell et al. (2012)* and *Blamey et al. (1996)*, respectively. In addition to habitat identification, each habitat was assessed for its ecological significance, based on the National Roads Authority (NRA) Site Evaluation Scheme (NRA, 2009).

5.3.4.1 Terrestrial Mammals, Birds and Bats

Any signs and sightings of terrestrial mammals were noted in the site walkover in November 2024. All bird activity seen or heard was noted. Potential bat habitats and roosts were also noted.

5.3.4.2 Aquatic Surveys

Aquatic ecology surveys, including biological assessment (Q-values) of the stream near the site, were also carried out in November 2024 by ORS.

5.3.4.3 Seasonal Constraints

Having regards to the limited and largely improved habitats within the main area of the Proposed Development site, it was considered that there were no seasonal constraints

associated with the habitat assessment element of the field work for this Biodiversity chapter. The timing of the survey was ideal for the identification of mammal tracks and signs.

5.3.5 Assessment Methodology

5.3.5.1 Evaluation of Ecological Features

The methodologies used to determine the value of ecological resources, to characterise the impacts of the Proposed Development, and to assess the significance of impacts and any residual effects are described below. This approach is in accordance with the following guidelines and methodologies:

- Guidelines for Ecological Impact Assessment in the UK and Ireland by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018)
- Guidelines On the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022)
- Guidelines for Assessment of Ecological Impacts of National Road Schemes. (NRA, 2009).
- Guidelines on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013).

CIEEM suggest that to ensure a consistency of approach, ecological features are valued in accordance with their geographical frame of reference, as defined below:

- International
- National (Ireland)
- Regional (Southeast)
- County (Wicklow)
- District (Arklow)
- Local/Townland (Moneylane, Arklow, County Wicklow)

The above categories are then applied to the ecological features identified. Ecological features can be defined as:

- Designated sites (i.e., SACs, SPAs, NHAs, pNHAs, National Nature Reserves) or non-statutory locally designated sites and features.
- Non-designated sites and habitats and features of recognised biodiversity value, such as rivers and streams. The features being evaluated can be considered in the context of the site and locality and thus a more accurate assessment of the impacts in the locality can be made.

5.3.5.2 Assessment of Impacts

The assessment of potential ecological impacts has been carried out using guidelines published by the EPA and the CIEEM. They can be summarised as:

- The identification of the range of potential impacts which can reasonably be expected to occur should the Proposed Development receive planning consent.
- The consideration of the systems and processes in place to avoid, reduce and mitigate the possible effects of these impacts.
- The identification of opportunities for ecological enhancement within the Proposed Development site.

Impacts are defined as being positive, negative, or neutral. A significant impact is defined as an impact upon the integrity of a defined ecosystem and/or the conservation status of a habitat or species within a given area. Where a potential negative impact has been identified, mitigation measures have been formulated using best practices techniques and guidance to prevent, reduce or offset the impact.

5.4 Characteristics of the Proposed Development

5.4.1 Description of the Proposed Project

The applicants, Mr. Seoirse McGrath and Nephin Renewable Gas - Moneylane Limited, propose to develop an Anaerobic Digestion Facility (herein referred to as the Proposed Development) on a site located in the townlands of Moneylane, Arklow, Co. Wicklow. The site is currently used as an agricultural pastureland and bounded to the north, south, east, and west by further agricultural pastureland. An operational farm is located on the opposite side of the road to the proposed site to the south. The site is bordered to the south by Ballyduff South Road (L6187) which intersects with the Coolgreaney or Knockenrahen Road (L2190), 57m southeast of the proposed site. The Proposed Development will be accessed via Ballyduff South Road (L6187).

Occupying an area of circa 4.02 hectares, the Proposed Development will accept and treat 90,000 tonnes per annum of locally sourced agricultural manures, slurries, food processing residues and crop-based feedstocks to produce grid quality biomethane, also known as renewable natural gas (RNG) suitable for direct injection into Gas Network Ireland's (GNI) transmission and distribution network. The RNG produced at the Anaerobic Digestion Facility will be used as a direct replacement for conventional natural gas and in doing so contribute towards the Government's aspiration to develop 5.7TWh of indigenous biomethane production. In addition to RNG, the facility will produce a nutrient rich biobased fertiliser which can be used as a direct replacement for fossil fuel derived fertiliser. The Anaerobic Digestion Facility will also include the recovery of biogenic carbon dioxide (CO_2) from the biogas upgrading process.

The development will consist of the following:

- Construction of 3 no. digesters (c. 15.5m in height), 2 no. digestate storage structures (c. 15.5m and c. 12m in height), a liquid feed tank (c. 4m in height) and 4 no. pump houses (with a GFA of 27 sq.m, 28 sq.m, 28 sq.m, and 14 sq.m, and each with a height of c. 2.6m), located in the northern section of the site.

- 4 no. pasteurisation tanks (each c. 6m in height), a post pasteurisation cooling tank (c. 4m in height) and a pre fertiliser manufacturing tank (c. 4m in height), located to the southeast of the digesters, in the centre of the site.

- A part single-storey and part two-storey reception hall (with a gross floor area (GFA) of c. 2,113 sq.m and an overall height of c. 16.5m) to accommodate a laboratory, panel room, tool store, workshop, and storage areas, with a liquid feed intake adjacent to the reception hall, located to the centre of the site.

- A single-storey solid digestate storage and a nutrient recovery building (with a GFA of c. 880 sq.m and an overall height of c. 12.4m) located to the east of the reception hall, in the central portion of the site.

- Odour abatement plant (with an overall height of c. 6m) and equipment and a digestate offtake area will be provided to the east of the solid digestate storage and nutrient recovery building.

- Construction of an ESB substation (with a GFA of c. 24 sq.m and a height of c. 3.4m), a fuel storage tank (c. 1.6m in height), a CNG compression unit (with a GFA of c. 20 sq.m and a height of c. 4.1m), 2 no. CO_2 tanks (c. 10.7m in height), a CO_2 loading pump (c. 2.6m in height), CO_2 auxiliaries (c. 2.6m in height), CO_2 liqueufactor (with an overall height of c. 8.2m), a CO_2 compressor (with an overall height of c. 5.9m and a GFA of c. 15 sq.m) and a CO_2 pre-treatment skid (c. 3.5m in height), located in the eastern portion of the site.

- Construction of an emergency biogas flare (c. 11.3m in height), a biogas treatment skid (with an overall height of c. 4.1m), a biogas compression system (with a maximum height of c. 5.8m in height), a biogas upgrading module (with a maximum height of c. 4.6m and a GFA of c. 28 sq.m), a combined heat and power unit and panel room (with a height of c. 5.8m) and a H2S washing tower (with an overall height of c. 7.8m), located within the eastern section of the site.

- Construction of a grid offtake skid, a biomethane boiler (c. 5.6m in height to flue stack), a grid injection unit (with a GFA of c. 22 sq.m and a height of c. 2.8m), and 2 no. propane tanks (c. 1.3m in height), located to the southeast of the CO_2 structures, within the eastern section of the site.

- Construction of a two-storey office and administration building (with an overall height of c. 8.6m and a GFA of c. 271.5 sq.m), located within the southeast section of the site, adjacent to the main site entrance.

- Associated works including parking (8 no. standard, 3 no. EV, and 1 no. accessible parking spaces; and bike storage), access arrangements (including new access point to the site from the adjacent road to the south), a weighbridge, provision of solar panels (roofed mounted solar array), wastewater treatment equipment, attenuation pond in the northern portion of the site, boundary treatments, lighting, services, lightning protection masts, drainage, landscaping, and all associated and ancillary works.

The proposed site layout is illustrated in **Figure 5.1.** A detailed description of the processes involved at this Proposed Development are included in **Chapter 2: Project Description** of this EIAR.

Figure 5.1: Extract from Planning Drawings (as prepared by ORS).

5.5 Receiving Environment

This section provides an overview of the existing ecological conditions within the site and the surrounding environment.

5.5.1 Site Location & General Description

The site in question is approximately 4.02 hectares in area. It is located in a rural area in the townland of Moneylane, Arklow, Co. Wicklow, approximately 2.1m southwest of Arklow Town Centre. The site will be accessed via the creation of a new entrance that is just off a local, third-class road (Ballyduff South Road). The site is bounded on all sides by managed agricultural lands. A map displaying the site location and environs can be seen in **Figure 5.2** below.

Figure 5.2: Site Location Map (Source: Google Earth Pro).

5.5.1.1 Land Use and Habitats Surrounding the Proposed Development

Using up to date aerial photographs, an overview of the land-use and habitats surrounding the site was assessed and noted. The accuracy of these maps was also verified during site investigation works carried out to inform this chapter.

The site is in a rural area where the predominant land use is agriculture, and the dominant habitat associated with this use is improved agricultural grassland (Fossitt Code: GA1). Other habitats represented in the wider area include semi-improved grasslands, hedgerows (WL1), and treelines (WL2). The hydrological setting of the subject site is assessed in **Chapter 8** of this report.

The site is located at a higher elevation as the surrounding fields drop in elevation and slope downwards in a valley characterised by the Ballyduff Stream.

An overview of the local habitats surrounding the Proposed Development site can be seen in the aerial photograph in **Figure 5.3**.

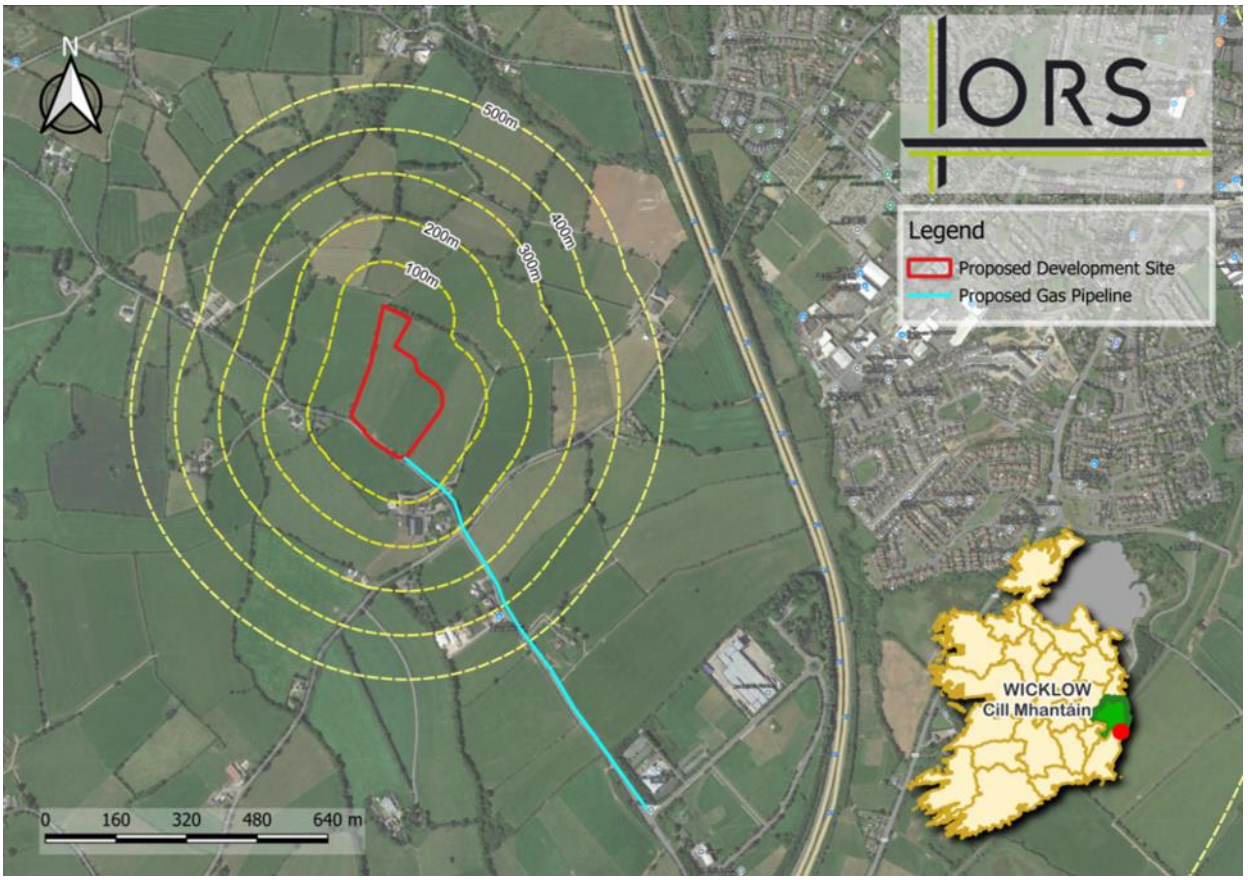

Figure 5.3 – Aerial photograph showing habitats surrounding the study area.

5.6 Designated Sites

5.6.1 Natura 2000 Sites

The Proposed Development site is not within or immediately adjacent to any site that has been designated as a Special Area of Conservation (SAC) or a Special Protection Area (SPA) under the EU Habitats or EU Birds Directive. Note: full AA screening carried out and supplied as part of this planning application (Document no. **241504-ORS-XX-XX-RP-EN-13d-004**).

There are three Natura 2000 sites within a 15km Zone of Influence of this Proposed Development site. These sites are summarised in **Table 5.2**. The location of the site in relation to these designated areas is shown in **Figures 5.4** and a full synopsis of these sites can be read online on the website of the National Parks and Wildlife Service (www.npws.ie).

Table 5.2 – Designated Sites within 15km of the Proposed Development

Site Name & Code	Distance from Site	Qualifying Interests
Natura 2000 Sites		
Buckroney-Brittas Dunes and Fen SAC/pNHA, 000729	*Ca*. 7.6km NE	• Annual vegetation of drift lines [1210] • Perennial vegetation of stony banks [1220] • Mediterranean salt meadows (*Juncetalia maritimi*) [1410] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) [2150] • Dunes with *Salix repens* ssp. argentea (*Salicion arenariae*) [2170] • Humid dune slacks [2190] • Alkaline fens [7230]
Kilpatrick Sandhills SAC/pNHA, 001742	*Ca.* 6.2km SE	• Annual vegetation of drift lines [1210] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) [2150]
Slaney River Valley SAC, 000781	*Ca.* 7.8km W	• Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] • Mediterranean salt meadows (*Juncetalia maritimi*) [1410] • Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]

		• Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] • Freshwater Pearl Mussel (*Margaritifera margaritifera*) [1029] • Sea Lamprey (*Petromyzon marinus*) [1095] • Brook Lamprey (*Lampetra planeri*) [1096] • River Lamprey (*Lampetra fluviatilis*) [1099] • Twaite Shad (*Alosa fallax fallax*) [1103] • Salmon (*Salmo salar*) [1106] • Otter (*Lutra lutra*) [1355] • Harbour Seal (*Phoca vitulina*) *[1365]*
Natural Heritage Areas		
Arklow Sand Dunes, pNHA, 001746	*Ca.* 2.3km NE	N/A
Arklow Rock-Askintinny pNHA, 001745	*Ca.* 2.6km SE	N/A
Kilgorman River Marsh pNHA, 001834	*Ca.* 8.0km S	N/A
Ballymoney Strand pNHA, 000745	*Ca.* 10.6km S	N/A
Courtdown Dunes and Glen pNHA, 000757	*Ca.* 14.1km S	N/A
Avoca River Valley pNHA, 001748	*Ca*. 3.1km N	N/A
Arklow Town Marsh pNHA, 001931	*Ca*. 2.2km NE	N/A

The generic conservation objectives of the SACs are:

"To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected."

The generic conservation objectives of the SPAs are:

"To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA."

The favourable conservation status of a habitat is achieved when:

- Its natural range and the area covered within that range is stable or increasing and the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future;
- The conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

The population dynamics data on the species concerned indicate that it is maintaining itself on a long -term basis as a viable component of its natural habitats.

- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future.
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

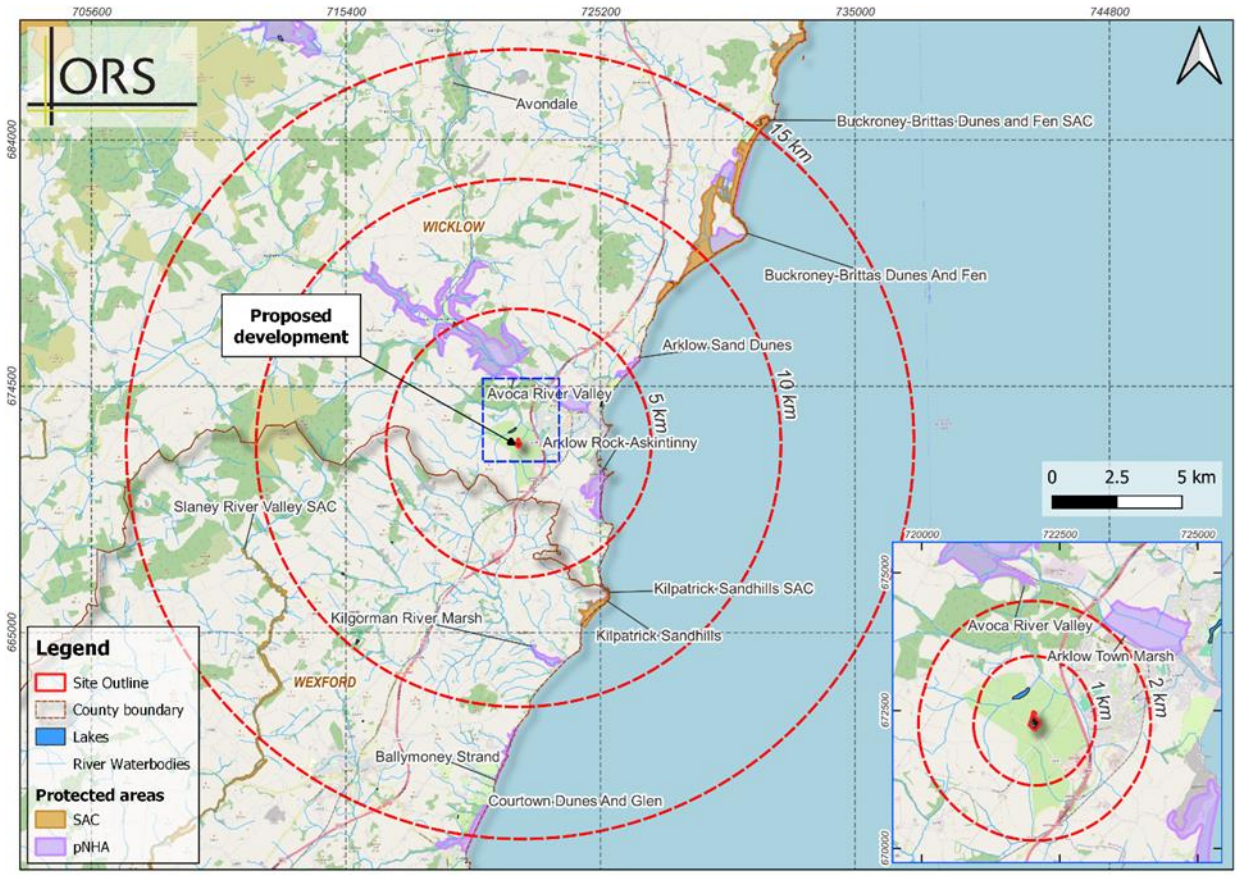

Figure 5.4 – Designated Sites within the 15km Zone of Influence of the Proposed Development (Pinned). SACs – Orange Hatching, SPAs – Pink Hatching.

5.6.2 Nationally Important Sites

The Proposed Development is not within or immediately adjacent to any nationally designated site, such as a Natural Heritage Area or a proposed Natural Heritage Area. It is within the Zone of Influence of nine sites that have been designated as proposed Natural Heritage Areas. These sites are summarised in **Table 5.2** and a map showing their locations relative to the Proposed Development is shown in **Figure 5.4**.

5.7 Flora

5.7.1 Habitats within the Study Area

These habitats are described in greater detail below, whilst a habitat map depicting the main habitats in the Proposed Development site is presented in **Figure 5.5**.

The Proposed Development site consists of one large field which will be accessed via the creation of an access point along the local road located immediately south of the site boundary.

Figure 5.5 – Habitat Map of the Proposed Study Area

The Proposed Development site encompasses a mix of habitats that vary in ecological value. These habitats along with their characteristics are described below:

Most of the site consists of improved agricultural grassland dominated by ryegrasses (*Lolium sp.*) and meadow grasses (*Poa spp*.) Broadleaved species are present in low proportions, with limited diversity in the grass sward.

No wetland indicator species such as rushes (*Juncus sp*), meadowsweet (*Filipendula ulmaria*), or flag iris (*Iris pseudacorsu*) were observed within the grassland. Although the ground was waterlogged at the time of the survey due to preceding seasonal rainfall, it is likely that the grassland drains well during drier months. This habitat extends beyond the Proposed Development site and is primarily used for agricultural purposes.

Hedgerows (WL1) are present along the perimeters of the site and are of high ecological value at the local level. These features provide important ecological functions, serving as habitat corridors for birds and invertebrates, and small mammals.

The southern boundary is defined by a dense hedgerow and treeline that includes species such as blackthorn and bramble, with climbing ivy observed in the canopy. Mature ash and beech are interspersed, supporting additional structural diversity. The western border features mature deciduous trees, including beech, contributing to the local landscape and acting as an

important corridor for wildlife movement.

No part of the Proposed Development site lies within or immediately adjacent to any area designated for nature conservation. The habitats within the site are primarily of low biodiversity value on a local scale, except for the hedgerows (WL1), which are of high local ecological importance. All proposed development activities will occur in areas of low ecological value, minimising any potential ecological impact.

5.7.1.1 Overall Evaluation of Habitats within the Proposed Development Site

Overall, the biodiversity and ecology of this Proposed Development site varies from low-high local value. The dominant habitat within the site is highly modified improved grassland. This habitat is of no biodiversity value. The hedgerows / treelines within the site are of higher biodiversity value and they would provide suitable nesting sites for birds.

A vegetative list of plants and trees within and along the site boundary was recorded. This list can be found in Table 5.3.

Table 5.3: List of Plant Taxa Recorded on Site Common Name	Scientific Name
Beech	*Fagus sylvatica L.*
Blackberry	*Rubus fruticosus*
Blackthorn	*Prunus x fruticans*
Bracken	*Pterdium aquilinum*
Bush Vetch	*Vicia sepium*
Chickweed	*Stellaria media*
Common Name	*Scientific Name*
Field Speedwell	*Veronica agrestis L.*
Field Thistle	*Cirsium arvense*
Goat Willow	*Salix caprea*
Grey Willow	*Salix atrocinerea*
Hawthorn	*Crataegus monogyna*
Holly	*Ilex aquifolium*
Hybrid Dock	*Rumex x acutus*
Lesser Spearwort	*Ranunculus flammula*
Little Robin	*Geranium purpureum*
Marsh Thistle	*Cirsium palustre*
Northern Bracken Fern	*Pteridium aquilinum*
Peat Moss	*Sphagnum*
Perennial Ryegrass	*Lolium perenne*
Persian Ivy	*Hedera colchica*
Railway Bramble	*Rubus elegantispinosus*
Red Clover	*Trifolium pratense*
Red Fescue	*Festuca rubra*
Ribwort Plantain	*Plantago lanceolata*
Rock Dandelion	*Taraxacum erythrospermum*
Saint Anthony's Turnip	*Ranunculus tuberosus*
Scrub Gall Oak	*Quercus lusitanica*

Shepherd's Purse	*Capsella bursa- pastoris*
Southern Cleavers	*Galium verrucosum*
Spear Thistle	*Cirsium vulgare*
Stinging Nettle	*Urtica dioica*

5.7.1.2 Rare and Protected Plant Species

An examination of the website of the National Parks and Wildlife, the National Biodiversity Data Centre (NBDC) and the Online Atlas of Vascular Plants for Ireland revealed that there are few records for plant species protected under the Flora Protection Order from within the 10km square (T27) of the Proposed Development site. Meadow Saxifrage (*Saxifraga granulate*), Wild Asparagus (*Asparagus protstratus*) and Moore's Horsetail (*Equisetum hyemale* x *ramsissimum* = *E*. x *moorei*) have all been reported to the NBDC as occurring in the T27 10km grid square. The majority of the habitats within the site are all highly modified and no protected plant species were noted within the Proposed Development site.

5.7.1.3 Invasive Species

No non-native invasive species that are regulated for control under the European Union (Invasive Alien Species) Regulations 2024 (SI 374) were recorded from within the study area.

5.8 Fauna

5.8.1 Protected Mammals

Records from the National Biodiversity Data Centre reveal the presence of the following protected mammals from within the 10km square (T27G) of this Proposed Development site:

- Bottle-nosed Dolphin (*Tursiops truncatus*)
- Common Dolphin (*Delphinus delphis*)
- Common Porpoise (Phocoena phocoena)
- Common Seal (*Phoca vitulina*)
- Grey Seal (*Halichoerus grypus*)
- Risso's Dolphin (*Grampus griseus*)
- American Mink (*Mustela vison*)
- Eurasian Badger (Meles meles)
- Brown Long-eared Bat (*Plecotus auritus*)
- Daubenton's Bat (*Myotis daubentonii*)
- Eurasian Red Squirrel (*Sciurus vulgaris*)
- European Otter (*Lutra lutra*)
- Fallow Deer (*Dama dama*)
- Irish Hare (*Lepus timidus subsp. hibernicus*)
- Irish Stoat (*Mustela erminea subsp. hibernica*)
- Lesser Noctule (*Nyctalus leisleri*)
- Sika Deer (*Cervus nippon*)
- Pine Marten (*Martes martes*)
- Soprano Pipistrelle (*Pipistrellus pygmaeus*)
- West European Hedgehog (*Erinaceus europaeus*)
- Whiskered Bat (*Myotis mystacinus*)

A custom polygon generated for the Proposed Development site revealed that Sika Deer (*Cervus nippon*), Eurasian Badger (*Meles meles*), Eurasian Red Squirrel (*Sciurus vulgaris*) and Irish Hare (*Lepus timidus subsp. hibernicus*) have been recorded within the general area surrounding the Proposed Development site. The NBDC data for the polygon area shows that the most recent records Badger in the area date back to 2012. The other mammal records for the custom polygon date back to 1980. This must be taken into account in the assessment. These records are not to be relied upon for as up to date evidence of presence of species listed.

All these species are protected under the Irish Wildlife Acts. In addition, the otter (*Lutra lutra*) is protected under Annex II of the European Habitats Directive. The field survey of the site found no badger setts present within the site, and no obvious worn tracks or trails that could be attributed to badgers were noted. However, having regards to the natural habitats that are present in the lands surrounding the site, the site may be of local importance to mammal species.

The riparian zone of the stream located north from the site was walked to determine the presence of any signs of otter such as slips, couches or spraints. None of the above signs were noted, however this does not exclude the possibility that otters use this stream. The presence of scat observed around the field indicated site use by Stoat (*Mustela erminea*) and Rabbit (*Oryctolagus cuniculus*).

5.8.2 Bats

5.8.2.1 Bat Suitability Index

The National Biodiversity Data Centre (NBDC) has produced a landscape suitability index for bat species in Ireland, and this is based on work by *Lundy et al (2011).* The results are provided as maps, where the area of concern is coloured to indicate the overall suitability of the landscape for bats. The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. The overall assessment of bat habitats for the current study area is given as 47.33, which is high. **Table 5.4** gives the suitability of the study area for the bat species found in the study area (based on NBDC).

Table 5.4 – Bat Suitability Index for the Proposed Development (NBDC)

Bat Species	Suitability Index
All Species	47.33
Brown Long-Eared Bat *Plecotus Auritus*	65
Soprano Pipistrelle (*Pipistrellus Pygmaeus*)	52
Natterer's *Bat Myotis Nattereri*	64
Nathusius' Pipistrelle (*Pipistrellus Nathusii*)	32
Daubenton's Bat (*Myotis Daubentoniid*)	42
Whiskered Bat (*Myotis Mystacinus*)	39
Lesser Noctule (*Nyctalus Leisleri*)	65
Lesser Horseshoe Bat (*Rhinolophus Hipposideros*)*	1
Common Pipistrelle (*Pipistrellus Pipistrellus*)	67

** Annex II Species*

5.8.2.2 Bat Features within the Proposed Development Site

There are no buildings within the site, however there are mature trees present along the site boundaries that may offer bat roost potential in the future. These tress are to be retained as part of the landscaping measures. There are farm outbuildings adjacent to the prosed site with multiple outbuildings which may be used for roosting. There is a large watercourse in the form of a small lake to the Northwest of the proposed site which has the potential to support Daubenton's Bat (*Myotis daubentoniid*) in the warmer months. Overall, the landscape is considered to be of high local importance for bats due to a good network of hedgerows and treelines around the fields in the wider area. These ecological features are important for commuting and foraging bats.

5.8.3 Birds

No birds of conservation concern were noted within the Proposed Development site during the site survey. The following bird species were observed with the use of binoculars and direct observation with the naked eye. Overall bird activity in the main field of the Proposed Development site was limited. The current conservation status of the birds is also given, where green status is of low conservation concern, amber is of medium concern and red is of high concern (*Gilbert et al., 2021*).

- Blackbird (*Turdus merula)* – Green Status
- Great tit (*Parus major)* – Green Status
- Wren (*Troglodytes troglodytes)* – Green Status
- Robin (*Erithacus rubecula*) – Green Status
- Chaffinch (*Fringilla coelebs)* – Green Status
- Starling (*Sturnus vulgaris)* – Amber Status
- Jackdaw (*Corvus monedula*) – Green Status
- Pheasant (*Phasianus colchicus*) – Green status
- Bullfinch (*Pyrrhula pyrrhula*) – Green status
- Black headed gull (*Larus ridibundus*) – Amber status
- Herring gull (*Larus argentatus*) – Amber status

Having regards to the network of treelines and hedgerows that surround the site, the site and its surrounding habitats are likely to be of medium-high local importance for birds.

5.8.4 Amphibians, Reptiles and Invertebrates

No common frogs (*Rana temporaria*) were observed during the site walkover, which took place on the 1st November. There were no pools or ponds, or drainage ditches that could support either frogs or newts in any of their life cycles. No suitable habitat for or signs of natterjack toad (*Epidalea calamita*) were observed. The flow at the stream in which the discharge calculations were made would likely be too fast for frogs and smooth newts (*Lissotriton vulgaris*) to inhabit or breed or lay eggs. There are no marginal grasses or reeds with which newts could lay their eggs. In summer months, the viviparous lizard (*Zootoca vivipara*) may bask on rocks or at pathway or agricultural road margins within the site. No Slowworm (*Anguis fragilis*) or their holes were observed.

The improved agricultural grassland habitats within the site provide limited value to pollinating insects, however any unmanaged verges along the site perimeters and the hedgerows would

provide suitable foraging habitats for pollinating insects in the late spring and summer.

5.9 Aquatic Environment

5.9.1 Water Features and Quality

5.9.1.1 Surface Waters – Water Framework Directive Status

The site is within the Ovoca-Vartry Hydrometric Area (10) and Catchment (10), the Avoca Sub-Catchment (20) and the Ballyduff Stream (010) Sub-Basin. There is a drainage ditch along the Northern perimeter of the field within the site, whilst the Ballyduff Stream flows Westwards along the Northern Perimeter of the Adjacent Field which is also situated to the North of the site. There is an underground watercourse which flows Northwards to meet the Ballyduff Stream.

The EPA have classed the ecological status of the Ballyduff Stream as Poor, with a Q-Value status of 3. The ecological status of the Ballyduff Stream at this point is noted as poor and the water body itself is classified as At Risk. Under the requirements of the Water Framework Directive, this is unsatisfactory, and good status must be achieved in these watercourses by the end of the 3rd WFD cycle (2027). An overview of the ecological status of the watercourse in the area and surrounding catchments is presented in **Figure 5.6**.

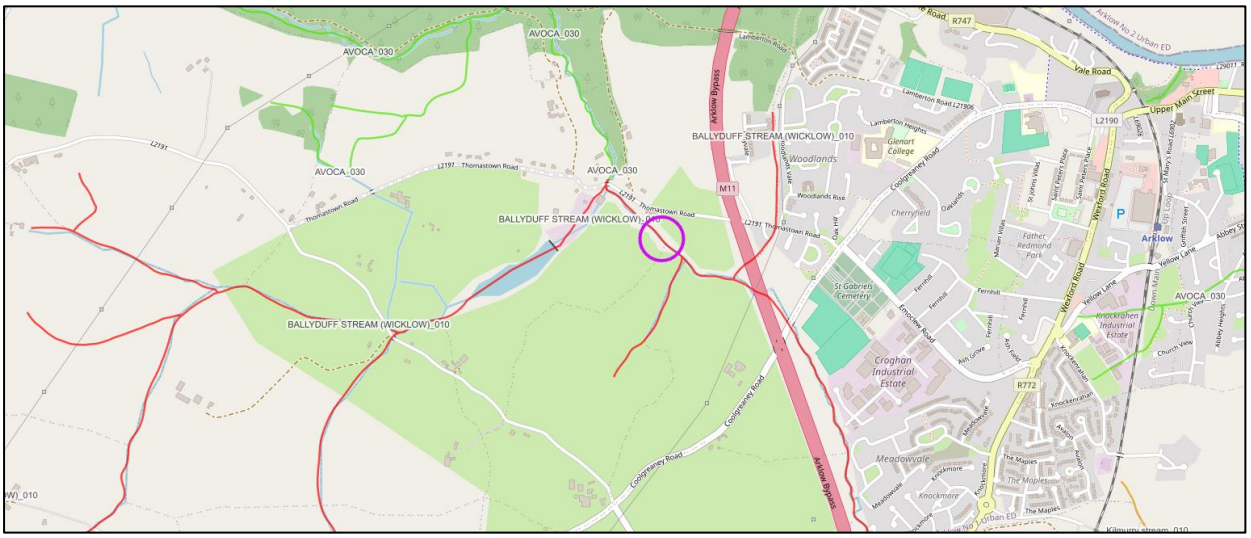

Figure 5.6 – Local WFD Status [Green – Good Status; Yellow – Moderate Status; Red – Poor Status].

5.9.1.2 Surface Waters – Biological Quality Assessment

The results of the biological water quality assessment from the Ballyduff Stream at points upstream and downstream of the site are presented below in **Table 5.5**.

Table 5.5 – Q Values Results of the Ballyduff Stream

Station ID	Q-Value	Ecological Status
Station 1 – Downstream	Q3	Poor
Station 2 – Upstream	Q4	Good

5.9.1.3 Ground Water

The Proposed Development site is within the Wicklow Groundwater Body and the current

status of this waterbody is noted as good. This Wicklow Groundwater Body is currently considered as At Risk. Within the Proposed Development site itself, groundwater vulnerability is noted as moderately vulnerable

5.10 Ecological Evaluation

5.10.1 Summary of the Value of the Site

The Proposed Development site is within the Zone of Influence of three sites designated under the Natura 2000 network (SACs / SPAs). The closest of these is Kilpatrick Sandhills SAC, which is 6.2km south-east of the site.

The Proposed Development site is also within 15km of nine sites designated as Natural Heritage Areas (NHAs and pNHAs). The closest of these is Arklow Town Marsh pNHA and this is 2.2km north-east of the site.

Within the Proposed Development site itself the dominant habitats are improved agricultural grasslands, hedgerows and treelines. The treelines and hedgerows that occur along the perimeters of the site are important ecological features - these areas provide important nesting areas and safe commuting corridors for local populations of birds and small mammals.

The NRA guidelines on the Assessment of Ecological Impacts on National Road Schemes (NRA, 2009) provides a rationale for the evaluation of ecological receptors within a site. **Table 5.6** lists the habitats that have been described within the Proposed Development site and their associated ecological value, based on the NRA guidelines.

Table 5.6 – Ecological Features and their Evaluation

Habitat	Rating	Criteria
Improved Agricultural Grasslands – GA1	No Value - Local Importance (Lower Value)	Limited biodiversity value although may provide some habitat opportunities for invertebrates and birds.
Hedgerow – WL1 Well Structured	Local Importance (Higher Value)	Essential in maintaining links and ecological corridors between features of higher ecological value. Provides value for local populations of bats, birds, mammals.

5.11 Impact Assessment

5.11.1 Introduction

The information gathered as part of the desk study and field survey for the Proposed Development has been used to complete an Ecological Impact Assessment (EcIA). This EcIA has been undertaken following the latest guidelines set out by CIEEM (2018) and the EPA.

The identification of potential impacts and the assessment of their significance typically requires the identification of the type and magnitude of the impacts. For example, will the impacts be short term or long term, direct, indirect or cumulative and will they occur during construction or operation. This section will establish whether ecological impacts of the Proposed Development are likely to occur and whether or not they are significant. These

potential impacts will be examined with respect to the ecological receptors identified in the previous section.

The emphasis in EcIA is on “significant” effects, rather than all ecological effects (CIEEM, 2018). For the purpose of EcIA, a “significant effect” is an effect that either supports or undermines biodiversity conservation objectives for important ecological features for biodiversity in general. Conservation objectives may be specific (e.g., for a designated site) or broad (e.g., national / local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local.

A significant effect is an effect that if sufficiently important to require assessment and reporting so that the decision maker (i.e., Local Authority) is adequately informed of the environmental consequences of permitting the project. In broad terms, significant effects encompass impacts on structures and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance, and distribution). (CIEEM, 2018).

5.12 Impacts upon Designated Sites

5.12.1 Natura 2000 Sites

A comprehensive assessment of the potential significant effects of the proposed works for a proposed Anaerobic Digestion Facility, Moneylane, Arklow, Country Wicklow was carried out in November 2024 by Neve McCann, BSc (Hons), MSc, of ORS Building Consultants.

The location of the Proposed Development is within a 15km Zone if Influence of sites designated under European Law. As such and in accordance with Article 6(3) of the EU Habitat’s Directive (Council Directive 92/43/EEC) regarding Appropriate Assessment, the screening exercise for Appropriate Assessment was carried out to identify whether any significant impacts on designated sites are likely. The exercise was used to determine the appropriateness of the proposed project, in the context of the conservation status of the designated sites.

Based on the information provided and the assessment conducted, it was the opinion of the author that the proposed development at Moneylane, Arklow, does not pose a significant risk to Natura 2000 sites due to the lack of any direct or indirect hydrological connection. Therefore, a Natura Impact Statement (NIS) was not required under Article 6(3) of the Habitats Directive.

However, the development is hydrologically connected to Arklow Town Marsh pNHA, which is protected under national biodiversity policy. By adhering to good housekeeping practices, implementing the measures outlined in the Construction Environmental Management Plan (CEMP), and ensuring effective pollution control and surface water management, potential negative impacts can be mitigated. Through these precautions, the ecological integrity of Arklow Town Marsh pNHA can be safeguarded.

5.12.2 Natural Heritage Areas

The Proposed Development will not result in the loss or fragmentation of protected habitats within any proposed Natural Heritage Area (pNHA) or designated Natural Heritage Area (NHA). However, one pNHA—Arklow Town Marsh (001931)—is located along the Ballyduff Stream and extends to the point just before it meets the Avoca River.

The Avoca River itself is not designated as a Natura 2000 site and is classified as "Not at Risk" under the Water Framework Directive. To assess potential impacts on sensitive species within the Arklow Town Marsh, a custom polygon was created for further investigation.

Species records indicate the presence of various mammals and birds in the area, including Curlew (*Numenius arquata*), Chinese Muntjac (*Muntiacus reevesi)*, Eastern Grey Squirrel (*Sciurus carolinensis*), Eurasian Badger (*Meles meles*), Eurasian Red Squirrel (*Sciurus vulgaris*), European Otter *(Lutra lutra*), Fallow Deer (*Dama dama*), Irish Hare (*Lepus timidus hibernicus*), Irish Stoat (*Mustela erminea hibernica*), Lesser Noctule (*Nyctalus leisleri)*, Pine Marten (*Martes martes*), Red Deer (*Cervus elaphus*), Red Fox (*Vulpes vulpes*), Sika Deer (*Cervus nippon*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), and West European Hedgehog (*Erinaceus europaeus*).

It is important to note that the most recent species records from this dataset date back to 2020. Additionally, because the data is publicly sourced, species identifications cannot be considered scientifically verified.

With the implementation of appropriate mitigation measures, the Proposed Development will not have a negative impact on the Arklow Town Marsh pNHA.

5.13 Impacts within the Site

5.13.1 Construction Phase

In the absence of suitable design and mitigation measures, the following impacts could occur during the site preparation and construction of the Proposed Development.

Habitat Loss and Fragmentation

The dominant habitat within the Proposed Development site is Improved Agricultural Grassland. This habitat will be converted to Buildings and Artificial Surfaces. This habitat has limited ecological value and therefore its loss constitutes a negligible ecological impact.

Plans indicate that the remaining mature vegetation along the boundaries will be retained and this will mitigate against any impacts due to the direct loss of these ecological features. However, damage to these existing hedgerows and mature trees and a subsequent reduction in their lifespan may arise if any root compaction occurs due to works or storage of heavy vehicles or spoil in the root protection zone (RPA) of these features. Any loss or damage to these features would have a negative impact upon the local biodiversity value.

Impacts During Construction of Gas Pipeline

The biomethane produced will be delivered to the existing gas grid via a new pipeline (which will be designed in detail, consented, and delivered by GNI). The proposed pipeline will connect to an existing medium pressure distribution pipeline located at Ballynattin, Co. Wicklow ca. 835m southeast. This may result in the temporary loss of grassy verges along the roadside.

Impacts on Local Wildlife

<u>Birds</u>
The boundaries of the site are within the hedge lines. It is not foreseen that any removal of vegetation will take place. In the absence of mitigation, any removal of vegetation within the

field or along the route of the gas pipeline during the bird nesting season could result in direct mortality of birds. In addition, during site preparation and construction, local populations of birds may be disturbed by the increase in noise, traffic and human activity.

Mammals
During site preparation and construction, local populations of mammals may be disturbed by the increase in noise, traffic and human activity.

There are mature trees present along the site boundaries that are potentially of bat roost potential. The landscape is considered to be of high local importance for bats due to a good network of hedgerows and treelines around the fields in the wider area. During site preparation and construction, local populations of bats may be disturbed by the increase in noise, traffic and human activity.

Amphibians, Reptiles, Insects
No significant effects anticipated.

Pollution to Surface and Ground Water – Site preparation and construction will occur on lands that are hydrologically connected to Ballyduff Stream. It is not foreseen that significant effects on this water feature will occur if adherence to CEMP and good housekeeping are observed to a high standard.

The site is in an area of moderate groundwater vulnerability. Any deep excavations that are required for the construction could lead to pollution of the groundwater with hydrocarbons or other pollutants.

5.13.2 Operational Phase

In the absence of suitable design and mitigation measures, the following impacts may arise during the operation of the Proposed Development that could affect the ecology / biodiversity of the Proposed Development site and its surrounding environs.

Impacts on Local Wildlife

Birds
Significant effects not anticipated during the operation of the site.

Mammals
Some disturbance to local mammal populations might occur due to human activity. Any increase in the baseline level of nighttime lighting in the area could give rise to negative effects upon local bats that might forage in the area.

Amphibians, Reptiles, Insects
No significant effects anticipated.

Pollution to Surface and Ground Water

Run-off from impermeable areas within the Proposed Development site such as roads and car parking areas may contain potentially polluting substances such as hydrocarbons. In the absence of mitigation, this run-off could be mobilised to the Ballyduff Stream and the Avoca River further downstream. In addition, structural weaknesses in any of the tanks could lead to pollution of the groundwater.

Flood Events - A flood event occurring on the developed site would cause the Sustainable Urban Drainage Infrastructure (SuDS) to become overwhelmed, creating additional pathways for potential contaminants to migrate off-site into downstream receptors along with elevated flow rates. The Proposed Development is located away from any flood zones and the overall flood risk of the site is low. The Proposed Development is situated on a high elevation of approximately 46 – 43 meters above sea level. The land slopes towards the Ballyduff Stream which is located approximately 25 meters above sea level.

Cumulative Impacts - Cumulative impacts refer to environmental changes resulting from multiple human-induced, small-scale alterations. These impacts occur through two primary pathways: (1) the persistent addition or loss of the same materials or resources, and (2) the compounding effects arising from the interaction of multiple factors (Bowers-Marriott, 1997).

The Proposed Development has been assessed in combination with other existing and proposed developments in the area to evaluate potential cumulative impacts. Over the past five years, several developments have been granted planning permission within the general vicinity. When considered alongside these projects, the Proposed Development may contribute to cumulative impacts on designated sites, particularly where developments have undergone screening for Appropriate Assessment (AA) (Stage I) or have proceeded through full AA (Stage II). However, any future planning application with the potential to impact a Natura 2000 site will be subject to Appropriate Assessment, as required under Article 6(3) of the Habitats Directive.

In the immediate vicinity of Moneylane, there are currently very few planning applications under review or recently approved. The developments in this area are small in scale and are not expected to contribute to local biodiversity loss or exert cumulative pressures on ecological receptors such as birds and mammals.

Additionally, the Proposed Development includes the creation of new biodiversity areas and the retention and protection of existing hedgerows. These measures will help maintain ecological corridors and networks, ultimately reducing the overall cumulative impact of the development in the Moneylane area.

5.14 Mitigation Measures

5.14.1 Introduction

In order to avoid any reductions in water quality in the area surrounding the Proposed Development, a number of mitigation measures must be implemented and followed. These measures will protect the surface and ground water quality locally and will subsequently prevent significant effects upon the Ballyduff Stream. Measures have also been suggested that will help to protect or enhance the local biodiversity of the surrounding area and to ensure the protection of local wildlife. The implementation of these site-specific mitigation measures will ensure the protection of the local non-designated ecological receptors.

It is recommended that the measures contained herein, along with all other measures outlined in this EIAR are contained in a Construction and Environmental Management Plan and that all works are overseen by an onsite Environmental or Ecological Clerk of Works.

5.14.2 Pre-Construction and General Requirements

- Site preparation and construction must be confined to the Proposed Development site only and it must adhere to all the mitigation measures outlined in this Chapter. Work areas should be kept to the minimum area required to carry out the proposed works and this area should be clearly marked out in advance of the proposed works.
- Prior to the commencement of developments on site, the site engineer and the contractors must be made aware of the ecological sensitivity of the Proposed Development site and its connection to the Ballyduff Stream. They must be made familiar with the mitigation measures outlined in this Chapter and a signed statement saying that they have taken on board the mitigation measures contained herein should be presented to the local authority along with the Notice of Commencement. The applicant will be responsible for alerting the engineers and contractors to the sensitivity of the habitats and water receptors surrounding the Proposed Development site. This will be done prior to the commencement of any site works.

5.14.3 Protection of Terrestrial Habitats and Features

- In accordance with the policies and objectives of the Regional and County Development Plans, the existing green infrastructure (GI) of the Proposed Development site, i.e., the treelines and hedgerows, must be incorporated into the development. In order to prevent damage to treelines / hedgerows in the Proposed Development site that are to be retained, then protective barrier fencing should be erected at a minimum 2m out from these boundaries to protect these features prior to the commencement of site clearance works. There must be no dumping or storage of construction waste or machinery in this zone during construction.
- Use of native trees and shrubs specified in landscaping maps provided in accordance with relevant standards.
- Any small tree or shrubs that require removal should be removed outside of the bird nesting season (March – August).

5.14.4 Mitigation Measures during Construction

5.14.4.1 Protection of Water Quality and Management of Pollutants

- Efficient construction practices and sequences should be employed on site, and this will minimise soil erosion and potential pollution of local watercourses with soil and sediment. Unnecessary clearance of vegetation should be avoided and only areas necessary for building works should be cleared. The retention of these areas will also help retain storm water run-off from the site during construction and operation.
- It is vital that there is no deterioration in water quality in the Ballyduff Stream. Therefore, strict controls of erosion, sediment generation and other pollutants associated with the construction process should be implemented, including the provision of attenuation measures, silt traps or geotextile curtains to reduce and intercept sediment release into any local watercourses. Guidelines in the following best practice documents should be adhered to:

    - Construction Industry Research and Information Association (CIRIA) (2005) Environmental Good Practice on Site (C692).
    - Construction Industry Research and Information Association (2001) Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532).
    - Construction Industry Research and Information Association (2000) Environmental Handbook for Building and Civil Engineering Projects (C512).
    - Environmental Protection Agency (2015) List of Waste and Determining if Waste is Hazardous or Non-Hazardous.
    - Environment Agency et al. (2015) Guidance on the Classification and Assessment of Waste, Technical Guidance WM3.

- Works in proximity to the stream should be avoided during periods of heavy rainfall.
- There must be no uncontrolled discharges of contaminated waters to ground or surface waters from this development, either during the construction or operation of the development. The control and management of hydrocarbons on site will be vital to prevent deteriorations in surface and groundwater quality locally. The following measures should be employed on site:

    - During construction re-fuelling of equipment and machinery must be done off site. If this is not possible, then a dedicated re-fuelling location must be established on site in the compound area away from ground clearance or rock-breaking activities.
    - Spill kits stations must be provided at the fuelling location for the duration of the works.
    - Staff must be provided with training on spill control and the use of spill kits.
    - All fuel storage containers must be appropriately bunded, roofed and protected from vehicle movements. These bunds will provide added protection in the event of a flood event on site.
    - All chemicals must be stored as per manufacturer's instructions. A dedicated chemical store within a building must be provided on site if chemicals are to be stored on site.
    - Procedures and contingency plans must be established on site to address cleaning up small spillages as well as dealing with an emergency incident. A stock of absorbent materials such as sand, spill granules, absorbent pads and booms should be kept on site, on plant working near the water and at the refuelling area.
    - Daily plant inspections will be completed by all plant operators on site to ensure that all plant is maintained in good working order. Where leaks are noted on these inspection sheets, the applicant must remove the plant from operations for repairs.

  - All personnel shall observe standard precautions for handling of materials as outlined in the Safety Data Sheets (SDS) for each material, including the use of PPE. Where conditions warrant, emergency spill containment supplies should be available for immediate use.

- Best practice concrete / aggregate management measures must also be employed on site during construction.

  - It is important that run-off from the construction works does not enter the Ballyduff Stream or any drains that lead to this stream. Therefore, it is recommended that silt fences are installed along the buffer zones of all watercourses within the site. The silt fences should be sturdy and constructed of a suitable geotextile membrane (Hy-Tex Terrastop Premium silt fence, or similar) to ensure that water can pass through, but that silt will be retained.
  - An interceptor trench will be required in front of this silt fence.
  - The silt fences should be monitored daily to ensure that they remain functional throughout the construction of the Proposed Development. Maintenance of the fences should be carried out regularly. Fences should be inspected thoroughly after periods of heavy rainfall.
  - Concrete Washout Skip: Chutes of concrete trucks are only to be washed out into an impermeable lined (polythene) skip. The washout water is to be removed off-site for treatment.
  - Excavations lined with an impermeable liner are not permitted as concrete washout bays on the site.
  - Large excess loads of concrete are to be returned to the supplier or poured into concrete block modules (Betonblock or similar design), in order to minimise waste and reduce the risk of concrete being dumped throughout site.
  - Best practice in bulk-liquid concrete management should be employed on site, addressing pouring and handling, secure shuttering, adequate curing times etc.
  - Stockpile areas for sands and gravel must be kept to a minimum size, well away from drains on site.
  - Where concrete shuttering is used, measures should be put in place to prevent against shutter failure and control storage, handling and disposal of shutter oils.
  - Activities which result in the creation of cement dust should be controlled by dampening down the areas.
  - Raw and uncured waste concrete should be disposed of by removal from the site.

- **Management of Impacts to Ballyduff Stream River Quality During Construction**

- During the laying of the pipeline though the identified lands, works must not take place within 6m of hedgerows and treelines. Where the pipeline must cross over a hedgerow or treeline, then the removal of mature trees must be avoided. Any vegetation removal must be done outside of the bird nesting season. Vegetation removal must be overseen by an ECoW.

- All guidelines within the document Inland Fisheries Ireland Requirements for the Protection of Fisheries Habitats during Construction and Development Works and River Sites (www.fisheriesireland.ie) and the updated guidelines entitled Guidelines on Protection of Fisheries During Construction Works in And Adjacent to Waters (2016) should be adhered to during the construction and they include:

  - Consultation with Inland Fisheries Ireland (IFI) to ensure that the development proceeds

with due regard to the provisions of the Fisheries Acts and Habitats Regulations.
- Consultation with IFI in order to determine the correct timing of works on the site.
- There should be no in stream works carried out without prior approval from IFI.

5.14.4.2 Management of Construction Waste and Soil

- All construction waste must be removed from site by a permitted contractor to a permitted waste facility. Evidence of the movement and safe disposal of the construction waste must be retained and presented to the Local Authority upon request. Removal of the construction waste should occur as soon as possible after construction works. There must be no disposal of construction waste or topsoil in any designated site or site of biodiversity value.
- All topsoil generated from site works should be stored within the Proposed Development site until it is required for landscaping. It must not be stored outside the Proposed Development site boundaries, and it must not be used for the infilling of any area outside of the Proposed Development site. If there is more topsoil than is needed for landscaping, it must be removed from site by a registered contractor for appropriate use elsewhere. The end location of the topsoil must be identified and records presented to the local authority if requested.

5.14.4.3 Protection of Bats

The following measures are recommended for the protection of bats within the site during construction:

- During the construction of the proposed development, general mitigation measures for bats will follow the National Road Authority's 'Guidelines for the Treatment of Bats during the Construction of National Road Schemes' NRA (2005) and the 'Bat Mitigation Guidelines for Ireland: Irish Wildlife Manuals, No. 25' (Kelleher, C. & Marnell, F. (2006)). These documents outline the requirements that should be met in the pre-construction and construction phases of developments to minimise negative impacts on roosting bats or prevent avoidable impacts resulting from significant alterations to the immediate landscape.

- Construction works will primarily take place during hours of daylight to minimise disturbance to any nocturnal mammal species. Where lighting is required, lighting mitigation measures will follow Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers (Bat Conservation Ireland, 2010). The following measures will be applied in relation to construction works lighting:

    - Lighting will be provided with the minimum luminosity necessary for safety and security purposes. Where possible, lighting will be restricted to the working area and using the cowl and angling noted above, will minimise overspill and shadows on sensitive habitats outside the construction area.
    - During construction, lighting will be positioned and directed so that it does not to unnecessarily intrude on adjacent ecological receptors and structures used by protected species. The primary area of concern is the potential impact on retained vegetation within and adjoining the site.
    - Site lighting will typically be provided by tower mounted temporary portable construction floodlights. The floodlights will be cowled and angled downwards to minimise spillage to surrounding properties. The following measures will be applied in relation to site lighting.
    - Where possible, construction lights will be switched off when not in use.

- There are no buildings within the site, however there are mature trees present along the site boundaries that are potentially of bat roost potential. Therefore, mature trees are to be retained and maintained where possible, as a biodiversity enhancement feature and potential roosting structure for bats.
- Where tree removal is necessary, the following mitigation measures will be implemented during tree removal. The contractor will take all required measures to ensure works do not harm individuals by altering working methods or timing to avoid bats, if necessary:

    - Crown reduction on trees will be minimised and that trees earmarked for retention are adequately protected.
    - Felled trees will not be mulched immediately. Such trees shall be left lying several hours and preferably overnight before any further sawing or mulching. This will allow any bats within the tree to emerge and avoid accidental death. If bats are seen or heard in a tree that has been felled, work shall cease and the local NPWS Conservation Ranger shall be contacted.
    - Trees will be retained where possible and no ‘tidying up’ of dead wood and spilt limbs on tree specimens shall be undertaken unless necessary for health and safety.
    - Trees/treelines outside the proposed development area but adjacent to it and thus at risk, shall be clearly marked by a bat specialist to avoid any inadvertent damage.
    - Where pruning is required, this will be undertaken in the period September to late October/early November. During this period bats are capable of flight and may avoid the risks of tree-felling if proper measures are undertaken.
    - If bats are seen or heard in a tree that has been felled, work shall cease and the suitability qualified ecologist will specify protection methods and will contact the National Parks & Wildlife Service. If bats are found, no works will proceed without a relevant derogation licence from the National Parks and Wildlife Service.

- If bats are recorded during site works, the NPWS will be informed immediately and no works will proceed without a relevant derogation licence from the NPWS.

5.14.5 Mitigation Measures during Operation

5.14.5.1 Environmental Management System (EMS)

An Environmental Management System (EMS) accredited to ISO14001:2015 will be prepared and implemented by the operating company during the operational phase. This is a practical document which will include detailed procedures to address the main potential effects on surface water and groundwater.

Having regard to current law and practice, the Proposed Development will require an application for an Industrial Emissions (IE) licence to the EPA in accordance with Class 11.4 (b) of the First Schedule of the EPA Act 1992 as amended.

The Proposed Development will operate under an Industrial Emissions Licence (IEL) issued by the Environmental Protection Agency (EPA). The licence will set conditions which the operator must remain in compliance with for the entire duration of the Anaerobic Digestion Facility’s lifespan.

Typical conditions relating to the protection of water receptors include:

- Emissions Limit Values for all emissions including surface water
- Monitoring requirements for surface waters

- Resource use and energy efficiency
- Waste management control and documentation
- Storage and transfer of substances
- Facility management
- Accident prevention and emergency response including fire water retention
- Operational Controls

Other conditions of relevance to uncontrolled releases will include:

- Dedicated hard standing for off-loading areas, with a minimum separation distance from adjacent water courses.
- Use of spill kits, bunded pallets and secondary containment units, as appropriate.
- All bunds sized to contain 110% of the volume of the primary storage vessel.
- Environmental Management System to include site specific standard operating procedures pertaining to waste management and emergency response.
- There will be no process water discharges to surface or groundwater bodies during the operational phase.
- The entire digestion tank area of the Proposed Development site will be underlain by an impermeable bund structure, acting as secondary containment in the event of a catastrophic failure.
- Tanks and bunds will be subject to integrity assessments by a suitably qualified engineer.

5.14.5.2 Landscaping and Lighting

The landscaping of the Proposed Development site offers the potential for biodiversity enhancements within the Proposed Development site. Future landscaping of the Proposed Development site should adhere to the following recommendations:

- The treelines and hedgerows around the site are important ecological corridors. These features should be enhanced and maintained for the benefit of wildlife.
- The existing gappy hedges should be enhanced with some more native shrubs if possible. Planting should focus on providing year-long interest for pollinators. Planting should be delivered in accordance with the Landscape Plan (Document Ref: **24/NRG/ORSML/A/001**) which accompanies the application.
- The natural verges along the hedgerows could also provide excellent opportunity for the benefit of wildlife. These should be managed as old hay meadows, cutting only in late summer. This will be of significant benefit to local pollinators.
- It is recommended that further actions that are outlined as part of the National Pollinator Plan should be implemented. There is a specific guide for farms (Farmland: Actions to help pollinators - //pollinators.ie/farmland).
- Nesting areas for solitary bees will be included by providing south or east-facing banks or areas of bare earth. Bee boxes for cavity-nesting bees could be created by drilling holes in untreated wooden blocks and attaching them to an outdoor structure. The holes should be 10cm in depth and 4-8mm in diameter at a height of at least 1.5-2m. It is important to have holes of different sizes for the different species.
- Bat boxes will be installed around the Proposed Development site, on walls, tree trunks and posts. They should be located as high as possible (at least 4m off the ground) in a sunny but sheltered location. If erecting on a mature tree, choose one that has clean bark (no ivy) with no branches for 1m radius around the location of the box. If erecting on a building, erect as close as possible to the eaves.

- When erecting bat boxes externally (i.e. on a tree or external wall of a building), put up a minimum of three boxes facing in different directions to provide a range of temperature conditions. For example, boxes facing from south-east to south-west allow the sun to fall on each box for part of the day. During very hot days a south-facing box may overheat, but the other boxes should have some shade. Three boxes can be arranged around the trunk of large, mature and clean trunk trees. When erecting bat boxes, erecting three different types of bat boxes will increase the chance of catering for the different species likely to be found foraging on the Proposed Development site. Guidelines for the construction of bat boxes can be obtained on the website of Bat Conservation Ireland.
- The use of herbicides within the Proposed Development site will be minimised. The clearance of vegetation around fences should be done by hand if possible. Where spraying is necessary, it should be done with a knapsack sprayer to minimise spray and target required areas only.
- All rodenticides use on the Proposed Development site should be in accordance with the Campaign for Responsible Rodenticide Use.
- Lighting should be kept to a minimum around the remaining trees on the Proposed Development site. Guidelines from Bat Conservation Ireland will be provided for considering how to avoid light pollution of the hedgerows to allow for feeding, commuting, and roosting.
- There should be no lighting directed from the Proposed Development site towards mature vegetation or the Ballyduff Stream.
- Lighting shall be controlled to avoid light pollution of green areas and shall be targeted to areas of human activity and for priority security areas. Motion-activated sensor lighting is preferable to reduce light pollution. None of the remaining mature trees or trees proposed for planting shall be illuminated.

    - Dark corridor for movement of bats along the grounds of the Proposed Development site. Lighting shall be directed downwards away from the treetops and shall not illuminate the hedgerows and treelines around the site, or the Ballyduff Stream or vegetation along its banks.
    - All luminaires shall lack UV elements when manufactured and shall be LED.
    - A warm white spectrum (ideally <2700 Kelvin) to reduce blue light component.
    - Luminaires shall feature peak wavelengths higher than 550nm.
    - Tree crowns shall remain unilluminated.
    - Planting shall provide areas of darkness suitable for bats to feed and commute.

5.14.6 Use of the Biobased Fertilisers by Customer Farmers

- In order to avoid any reductions in water quality within the catchment as a whole, all biobased fertilisers must be used in accordance with S.I. 113 of 2022 European Communities (Good Agricultural Practice for Protection of Waters Regulations, 2022).
- The spreading of the biobased fertiliser on the customer farms must be done in accordance with the specific Nutrient Management Plan for that farm. Records will kept by the farmer and routinely provided to the Applicant for verification and copies will be retained on site.

5.15 Residual Impacts

According to Environmental Protection Agency guidelines, Residual Impact is described as '*the degree of environmental change that will occur after the proposed mitigation measures have taken place*.' The mitigation strategy above recommends actions to be taken to reduce or offset the scale, significance, and duration of the effects on the surrounding ecological receptors.

5.15.1 Construction Phase

A summary of the predicted effects associated with the construction phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual effects are summarised in **Table 5.7**.

The overall impact anticipated for the construction phase of the project following the implementation of suitable mitigation measures is considered to be ***neutral***, ***slight***, and ***temporary.***

5.15.2 Operational Phase

A summary of the predicted effects associated with the operational phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual effects are summarised in **Table 5.8.**

The overall impact anticipated for the operational phase of the project following the implementation of suitable mitigation measures is considered to be ***neutral***, ***slight***, and ***short-term*** to ***long-term***.

5.15.3 Conclusion

With the recommended mitigation measures, it can be concluded that the Proposed Development site at Moneylane, County Wicklow, will have a neutral impact upon local ecological receptors. The proposed landscaping plan and the creation of new habitats on the Proposed Development site will be a positive benefit to local ecology and with proper management of the Proposed Development site and its green areas, local areas of biodiversity will be allowed to develop.

Potential Source	Environmental Receptor	Impact Description	Quality	Significance	Duration	Mitigation	Residual Impact
Habitat Loss and Fragmentation	**Improved Agricultural Grasslands**	The dominant habitat within the site is Improved Agricultural Grasslands. This habitat will be converted in part to new buildings and artificial surfaces. This habitat has limited ecological value and therefore its loss constitutes a negligible ecological impact.	Negative	Negligible	Temporary	• The landscaping of the site offers the potential for biodiversity enhancements within the site. • Any existing gappy hedges should be enhanced with native shrubs if possible, such as hawthorn, gorse, and blackthorn. • Planting should focus on providing year-long interest for pollinators. • Selected areas around the site to be seeded with species rich grassland to promote biodiversity.	**Positive, Slight, Long Term**
	Hedgerows and grassy verges	The biomethane produced will be piped along the local access road. The installation of the pipeline may result in the loss of hedgerows and grassy verges along the roadside.	Negative	Slight	Temporary	• Roadside hedgerows must be left intact, and the root systems of these hedgerows must not be damaged. • Upon completion of the work, the soil should be reinstated, and grassy verge vegetation should be allowed to recolonise naturally.	**Neutral, Slight, Temporary**

Disturbance to Local Wildlife		Any removal of vegetation during the bird nesting season could result in disturbance of birds. In addition, during site preparation and construction, local populations of birds and mammals may be disturbed by the increase in noise, traffic, and human activity.	Negative	Moderate	Long-term	• In accordance with the policies and objectives of the Regional and County Development Plans, the existing green infrastructure (GI) of the site, i.e. the stonewalls and hedgerows, must be incorporated into the development. • In order to prevent damage to treelines / hedgerows in the site that are to be retained, then protective barrier fencing should be erected at a minimum 2m out from these boundaries to protect these features prior to the commencement of site clearance works. There must be no dumping or storage of construction waste or machinery in this zone during construction. • Any small tree or shrubs that require removal should be removed outside of the bird nesting season (March – August).	**Neutral, Slight, Temporary**
Pollution to Surface and Ground Water	**Surface Water** Ballyduff Stream and downstream receptors of the Arklow Town Marsh pNHA (2.2km away).	The clearing of the site and the construction of an anaerobic digestor and associated works will generate sediment and without due care this sediment could be mobilised into the Ballyduff Stream on days of excessively heavy rainfall. These works could also result in the pollution of the water with cement or other hydrocarbons.	Negative	Moderate	Temporary		**Neutral, Slight, Temporary**

	Groundwater Wicklow Groundwater Body	The site is in an area of moderate groundwater vulnerability. In the absence of mitigation, any deep excavations that are required for the construction could lead to pollution of the groundwater with hydrocarbons or other pollutants.	Negative	Moderate	Long Term	• Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer. • Works should be avoided during periods of heavy rainfall. • The control and management of hydrocarbons on site will be vital to prevent deteriorations in surface and groundwater quality locally. The following measures should be employed on site: • During construction re-fuelling of equipment and machinery must be done off site. If this is not possible, then a dedicated re-fuelling location must be established on site in the compound area away from ground clearance or rock-breaking activities. • Spill kits stations must be provided at the fuelling location for the duration of the works. • Staff must be provided with training on spill control and the use of spill kits. • All fuel storage containers must be appropriately bunded, roofed and protected from vehicle movements. These bunds will provide added protection in the event of a flood event on site.	**Neutral, Slight, Temporary**

						• All chemicals must be stored as per manufacturer's instructions. A dedicated chemical store within a building must be provided on site if chemicals are to be stored on site. • Procedures and contingency plans must be established on site to address cleaning up small spillages as well as dealing with an emergency incident. A stock of absorbent materials such as sand, spill granules, absorbent pads and booms should be kept on site, on plant working near the water and at the refuelling area. • Daily plant inspections will be completed by all plant operators on site to ensure that all plant is maintained in good working order. Where leaks are noted on these inspection sheets, the applicant must remove the plant from operations for repairs. • All personnel shall observe standard precautions for handling of materials as outlined in the Safety Data Sheets (SDS) for each material, including the use of PPE. Where conditions warrant, emergency spill containment supplies should be available for immediate use. • Best practice concrete / aggregate management measures must also be employed on site during construction.	

Table 5.7: Summary of predicted construction phase effects, mitigation measures and residual impact

Potential Source	Environmental Receptor	Impact Description	Quality	Significance	Duration	Mitigation	Residual Impact
Disturbance to Local Wildlife		The operation of the site will be associated with an overall increase in human activity, noise and lighting on the site. However, having regards to the overall low value of the site to mammals, this impact is not considered significant. However, mitigation measures will be included to ensure that all lighting used within the site is of a low level to ensure minimum disruption to bats and other nocturnal mammals.	Negative	Slight	Long term	• The natural verges along the stonewalls hedgerows could also provide excellent opportunity for the benefit of wildlife. These should be managed as old hay meadows, cutting only in late summer. This will be of significant benefit to local pollinators. Herbicides must not be used along these natural verges, and they should be 1.5m – 2m wide at the base. • It is recommended that further actions that are outlined as part of the National Pollinator Plan should be implemented. There is a specific guide for farms (Farmland: Actions to help pollinators - //pollinators.ie/farmland). • Nesting areas for solitary bees will be included by providing south or east-facing banks or areas of bare earth. Bee boxes for cavity-nesting bees could be created by drilling holes in untreated wooden blocks and attaching them to an outdoor structure. The holes should be 10cm in depth and 4-8mm in diameter at a height of at least 1.5-2m. It is important to have holes of different sizes for the different species. • Bat boxes will be installed around the site, on walls, tree trunks and posts. They should be located as high as possible (at least 4m off the ground) in a sunny but sheltered location. If erecting on a mature tree, choose one that has clean bark (no ivy) with no branches for 1m radius around the location of the box. If erecting on a building, erect as close as possible to the eaves. • When erecting bat boxes externally (i.e. on a tree or external wall of a building), put up a minimum of three boxes facing in different directions to provide a range of	**Neutral, Slight, Long term**

						temperature conditions. For example, boxes facing from south-east to south-west allow the sun to fall on each box for part of the day. During very hot days a south-facing box may overheat, but the other boxes should have some shade. Three boxes can be arranged around the trunk of large, mature and clean trunk trees. When erecting bat boxes, erecting three different types of bat boxes will increase the chance of catering the different species likely to be found foraging on the site. Guidelines for the construction of bat boxes can be obtained on the website of Bat Conservation Ireland. • The use of herbicides within the site will be minimised. The clearance of vegetation around fences should be done by hand if possible. Where spraying is necessary, it should be done with a knapsack sprayed to minimise spray and target required areas only. • All rodenticides use on the site should be in accordance with the Campaign for Responsible Rodenticide use. • Lighting should be kept to a minimum around the remaining trees on the site. Guidelines from Bat Conservation Ireland will be provided for considering how to avoid light pollution of the hedgerows to allow for feeding, commuting, and roosting. • There should be no lighting directed from the site towards mature vegetation along the site boundaries or along the Ballyduff Stream. • Lighting shall be controlled to avoid light pollution of green areas and shall be targeted to areas of human activity and for priority security areas. Motion-activated sensor lighting is preferable to reduce light pollution. None of the remaining mature trees or trees proposed for	

						planting shall be illuminated. • Dark corridor for movement of bats along the grounds of the site. Lighting shall be directed downwards away from the treetops and shall not illuminate the Ballyduff Stream or the mature vegetation surrounding the site. • All luminaires shall lack UV elements when manufactured and shall be LED. • A warm white spectrum (ideally <2700 Kelvin) to reduce blue light component. • Luminaires shall feature peak wavelengths higher than 550nm. • Tree crowns shall remain unilluminated. • Planting shall provide areas of darkness suitable for bats to feed and commute.	
Pollution to Surface and Ground Water		In the absence of mitigation, run-off from impermeable areas within the Proposed Development site such as roads and car parking areas may contain potentially polluting substances such as hydrocarbons etc. This run-off could be mobilised to the Ballyduff Stream. Structural weaknesses in any of the tanks could lead to pollution of the groundwater.	Negative	Moderate	Long Term	• An Environmental Management System (EMS) will be prepared and implemented by the operating company during the operational phase. This is a practical document which will include detailed procedures to address the main potential effects on surface water and groundwater. • The Proposed Development will operate under an Industrial Emissions Licence (IEL) issued by the Environmental Protection Agency (EPA). The licence will contain several conditions which the operator must remain in compliance with for the entire duration of the AD facility's lifespan. Including: ○ Emissions Limit Values for all emissions including surface water	**Neutral, Slight, Long term**

						○ Monitoring requirements for surface waters ○ Storage and transfer of substances ○ Facility management ○ Accident prevention and emergency response including fire water retention ○ Operational Controls Other conditions of relevance to uncontrolled releases will include: • Dedicated hard standing for off-loading areas, with a minimum separation distance from adjacent water courses. • Use of spill kits, bunded pallets and secondary containment units, as appropriate. • All bunds sized to contain 110% of the volume of the primary storage vessel. • Environmental operating plan to include site specific standard operating procedures pertaining to waste management and emergency response. • There will be no uncontrolled discharges to surface or groundwater bodies during the operational phase. • The entire digestion tank area of the site will be underlain by an impermeable bund structure, acting as secondary containment in the event of a catastrophic failure. • Tanks and bunds will be subject to integrity assessments by a suitably qualified engineer.	

Table 5.8: Summary of predicted operational phase effects, mitigation measures and residual impact

Appendix 13.1: References

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