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 Ballyvass, Co. Kildare 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 site of the Proposed Development. 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, then 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 Kildare County Development Plan 2023–2029. This plan contains a number of objectives and Development Management Requirements relevant to ecology, biodiversity, green infrastructure and nature conservation. These are summarised in **Table 5.1**.

Table 5.1: Development Management Requirements Relevant to Ecology and Nature Conservation.

Policy No:	Biodiversity Policy Objectives
B1 P1	Integrate in the development management process the protection and enhancement of biodiversity and landscape features by applying the mitigation hierarchy to potential adverse impacts on important ecological features (whether designated or not), i.e. avoiding impacts where possible, minimising adverse impacts, and if significant effects are unavoidable by including mitigation and/or compensation measures, as appropriate. Opportunities for biodiversity net gain are encouraged.
B1 P2	Seek to contribute to maintaining or restoring the conservation status of all sites designated for nature conservation or proposed for designation in accordance with European and national legislation and agreements. These include Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Natural Heritage Areas (NHAs), Ramsar Sites and Statutory Nature Reserves.

B1 P3	Ensure that any proposal for development within or adjacent to a Natural Heritage Area (NHA), Ramsar Sites and Nature Reserves is designed and sited to minimise its impact on the biodiversity, ecological, geological and landscape value of the site, particularly plant and animal species listed under the Wildlife Acts and the Habitats and Birds Directive including their habitats.
B1 P4	Ensure that any new development proposal does not have a significant adverse impact, incapable of satisfactory mitigation on plant, animal or bird species which are protected by law.
B1 A9	Undertake surveys and collect data to provide an evidence-base to assist the Council in meeting its obligations under Article 6 of the Habitats Directives (92/43/EEC) as transposed into Irish Law, subject to available resources.
BI P5	Identify and conserve locally important biodiversity sites in the county which contribute to the overall ecological network of County Kildare.
B1 P6	Recognise the important contribution trees and hedgerows make to the county biodiversity resource climate mitigation, resilience and adaptation.
B1 P7	Recognise and promote inland waters, natural environmental assets and to protect rivers, streams and other watercourses and, wherever possible, maintain them in an open state capable of providing suitable habitats for fauna and flora while discouraging culverting or realignment.
B1 P8	Ensure that Kildare's wetlands and watercourses are retained for their biodiversity, climate change mitigation properties and flood protection values and at a minimum to achieve and maintain at least good ecological status for all wetlands and watercourses in the county by, at the latest, 2027 in line with the Water Framework Directive and Ramsar Convention.
B1 P9	Implement and support measures for the prevention and/or eradication of invasive species within the county and the control of noxious weeds.
B1 P10	Maintain and protect the conservation value of geological sites of national or local importance and seek the sustainable management of the county's geological heritage resource.
B1 P11	Identify and map the key elements of the green infrastructure network in Kildare; and seek to protect, enhance, and expand the County's green infrastructure network, through informed, evidence-based methods, which do not threaten the integrity of existing native biodiversity.
B1 P12	Recognise the importance of Green Infrastructure in Kildare and protect this valued biological resource, the ecosystem services it provides and the contribution to climate resilience.
BI P13	Recognise the importance of Urban Green Infrastructure in addressing a broad range of urban challenges, such as connecting people with nature, adapting to climate change, supporting the green economy and improving social cohesion and to seek to protect and enhance this resource, particularly existing semi-natural areas, or habitats (such as hedgerows, canals, rivers, ponds).
BI PI4	Protect and enhance the Green Infrastructure network throughout the county.
BI P15	Promote and support the development of Sustainable Urban Drainage Systems (SuDS) to ensure surface water is drained in an environmentally friendly way by replicating natural systems.
IN P2	Ensure the protection and enhancement of water quality throughout Kildare in accordance with the EU WFD and facilitate the implementation of the associated programme of measures in the River Basin Management Plan 2018-2021 (and subsequent updates).
IN P3	Support Irish Water to ensure adequate and appropriate wastewater treatment infrastructure is available over the Plan period to service the projected growth of towns and villages throughout Kildare in accordance with the Core Strategy and Settlement Hierarchy.
IN P4	Ensure adequate surface water drainage systems are in place which meet the requirements of the EU Water Framework Directive and the River Basin Management Plan in order to promote the use of Sustainable Drainage Systems.
IN P5	Ensure the continued incorporation of Flood Risk Management and National Flood Risk Policy (2018) into the spatial planning of Kildare, to meet the requirements of the EU

	Floods Directive and the EU Water Framework Directive and to promote a climate resilient County.
IN P6	Implement European Union, National and Regional waste related environmental policy, legislation, guidance, and codes of practice, in order to support the transition from a waste management economy towards a circular economy.
IN P7	Support the implementation of the Water Framework Directive, the River Basin Management Plan, and the Local Authority Waters Programme in achieving and maintaining at least good ecological status for all water bodies in the county.
IN P8	Implement the provisions of EU and National legislation on air, noise, and light pollution and other relevant legislative requirements, as appropriate.
IN O56	Protect water quality from pollution by agricultural sources and to promote the use of good farming practices in accordance with the Nitrates Directive (91/676/EEC) and Ireland's Nitrates Action Programme 2017- 2021 (including any subsequent update).
IN O57	Assess applications for developments, having regard to the impact on the quality of surface waters and any targets and measures set out in the River Basin Management Plan and any subsequent local or regional plans. Where developments have the potential to impact the water qualify of surface waters and/or any of the targets and measures set out in the RBMP, such a project should be subject to AA screening and where applicable, Stage 2 AA.
IN O58	Require development proposals which may have an impact on water quality to undertake site specific assessments to determine localised pressures and demonstrate suitable mitigation measures to protect water quality.
IN O59	Ensure that all future development is in accordance with the EU Ambient Air Quality and Cleaner Air for Europe (CAFÉ) Directive (2008/50/EC).
IN O60	Continue to monitor air quality at selected locations throughout the county in co-operation with the Health Service Executive and the Environmental Protection Agency.
IN O61	Support the use of air quality monitors at schools throughout Kildare.
IN O62	Promote and support the ban on the use, marketing, sale, and distribution of bituminous coal in Naas, Newbridge, Celbridge, Leixlip and Maynooth.
IN O63	Implement the relevant spatial planning recommendations and actions of the Kildare Noise Action Plan 2019-2023 (and any subsequent update).
IN O64	Ensure that future developments are designed and constructed to minimise noise disturbance and consider the multi-functional uses of streets including movement and recreation, as detailed in the Urban Design Manual (2009) and the Design Manual for Urban Roads and Streets (2013).
IN O65	Ensure that noise levels caused by new and existing developments throughout the county do not exceed normally accepted standards.
IN O66	Enforce and comply with European Communities (Environmental Noise) Regulations 2018 by: • Regulating and controlling activities likely to give rise to excessive noise (other than those activities which require regulation by the EPA) • Requiring new developments and / or activities likely to give rise to excessive noise to install noise mitigation measures and monitors.
IN O67	Ensure noise sensitive development in proximity to national and other roads provides a noise impact assessment / Acoustic Design Statement to the requirements set out in the Noise Action Plan and Local Planning Advice Notes as may issue and includes appropriate spatial consideration in the design phase and, where necessary physical mitigation measures, such as noise barriers, set back landscaping and / or buffer zones between areas of land where development is proposed and existing / proposed national or other roads.
IN O68	Require the design of external lighting schemes to minimise the incidence of light spillage or pollution into the surrounding environment having regard to the residential amenity of surrounding areas and the need to mitigate adverse impacts on sensitive fauna and protected species.
IN O69	Investigate measures to improve the approach to street lighting and ensure new developments are lit appropriately protecting environmentally sensitive areas.

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.

The Kildare Biodiversity Action Plan and Kildare Heritage Plan 2019- 2025 identify a number of objectives and policies in order to protect the natural heritage and biodiversity of County Kildare.

5.2 Methodology

5.2.1 Statement of Competence

This report was carried out by Neve McCann, BSc (Hons), MSc. Neve is a Graduate Ecologist at ORS with a diverse skill set in marine and terrestrial ecology, ecological assessments, and environmental conservation projects. She has advanced expertise in data analysis and GIS tools, excelling in habitat mapping, biodiversity monitoring, and environmental assessments. Neve played a key role in the seafloor integrity and food webs assessments for Ireland's Marine Strategy Framework Directive (MSFD) in her previous role, contributing to the most recent knowledge on the health of Irish waters. She was responsible for writing technical reports under the MSFD, ensuring accurate assessments of marine ecosystems. She has extensive fieldwork experience, having participated in numerous marine and terrestrial surveys and ecological projects. She is also a named coauthor on several published technical reports related to the marine environment, including two publications on underwater TV imaging analysis for marine fisheries management, a study on the impacts and trade-offs of fisheries on benthic habitats, and research on the distribution of Vulnerable Marine Ecosystems in Irish waters.

In her current role at ORS, Neve has developed strong experience in ecological reporting, including Appropriate Assessment (AA) Screenings, Natura Impact Statements (NIS), Ecological Impact Assessments (EcIA), Preliminary Ecological Appraisals (PEA), Biodiversity Chapters for Environmental Reports, and Risk Assessment Method Statements (RAMS). As an ecologist, Neve collaborates with multidisciplinary teams to deliver high-quality environmental solutions, ensuring compliance with regulatory frameworks and promoting biodiversity conservation.

5.2.2 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.

5.2.3 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 nature 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.
- 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.
- Kildare County Council – Information pertaining to planning history in the area and other plans and projects to allow an assessment of the potential cumulative impacts.

5.2.4 Field Based Studies

Visits to the Proposed Development site at Ballyvass, Kildare was conducted by a team of ORS Ecologists on November 28th, 2024, and August 5th, 2025, 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 methodology used in this report to assess the impact on habitats is based on NRA guidelines (2009).

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).

5.2.4.1 Terrestrial Mammals, Birds and Bats

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

5.2.4.3 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 EcIA. The timing of the survey was ideal for the identification of mammal tracks and signs.

5.2.5 Assessment Methodology

5.2.5.1 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 (East).
- County (Kildare).
- District (Kildare).

- Local/Townland (Ballyvass, Kildare).

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.

5.2.5.2 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.

5.3 Characteristics of the Proposed Development

5.3.1 Description of the Proposed Project

The applicant, CycleØ IE Ltd., propose to develop an Anaerobic Digestion Facility (herein referred to as the Proposed Development) on a site located in the townlands of Ballyvass, Kildare.

Occupying an area of circa 5.12 hectares, the 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 bio 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 2 no. primary digesters (with an overall height of c. 9.1m), a digestate storage tank (with a height of c. 11.3m), a pump house (with a gross floor area (GFA) of c. 362 sq.m), 2 no. post digester tanks (with an overall height of c. 9.1m), and a safety flare (c. 11.3m in height), located in the southeastern section of the site.
- Construction of 2 no. prepits (c. 4.3m in height), a pasteurisation buffer tank (c. 4.3m in height), and a pasteurisation unit (with a maximum height of c. 4.2m), located to the west of the primary digesters, within the southern section of the site.
- Construction of digestate treatment and feedstock reception building and odour abatement system (with a GFA of c. 2,797 sq.m and a height of c. 12.1m and c. 16.2m to top of odour abatement stack) located within the southwestern section of the site.
- Construction of roofed silage clamps (with a GFA of 2,424 sq.m and a height of c. 8.7m) and a fuel storage tank (c. 2m in height), located within the western section of the site.
- Construction of a combined heat and power (CHP) unit (with a GFA of c. 39 sq.m and a height of c. 2.6m and c. 5.6m to top of flue), a biogas boiler (c. 2.6m in height and c. 5.6m in height to top of flue), a backup boiler (c. 2.6m in height), located within the northern section of the site.
- Construction of a gas treatment unit (c. 4.2m in height), a grid injection unit (with a GFA of c. 22 sq.m and a height of c. 2.8m), and a CO_2 liquefactor (with an overall height of c. 10.7m to top of storage vessels) a propane tank compound accommodating 2 no. propane tanks (c. 1.6m in height), and an ESB substation (with a GFA of c. 24 sq.m and a height of c. 3.4m), located within the northern section of the site.
- Construction of a two-storey ancillary administration building (with a GFA of c. 327 sq.m and a height of c. 11m) within the northern section of the site, adjacent to the site entrance.
- Alterations to the adjacent local road and site access road, including junction improvement and widening and site entrance and access arrangements.
- Associated and ancillary works including parking (9 no. standard, 2 no. EV and 1 no. accessible parking spaces, and bike storage for 10 no. bikes), site entrance and gate, a weighbridge, solar PV arrays at roof level, wastewater treatment equipment, bunding and surface treatments, boundary treatments, lighting, services, lightning protection masts, drainage, landscaping and tree planting, and all associated and ancillary works.

Extracts from the planning drawings as submitted can be seen in **Figure 5.1**. A detailed description of the processes involved at this Proposed Development are included in **Chapter 2: Project Description** of this EIA.

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

5.4 Receiving Environment

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

5.4.1 Site Location & General Description

The Proposed Development site (herein referred to as 'the site') is located in the townland of Ballyvass, Co. Kildare, approximately 3.3km northwest of the town of Castledermot, Co. Kildare and approximately 11.3km northeast of Carlow town, Co. Carlow. The approximate grid reference location for the center of the site is 52.9393592, -6.8573295.

The area surrounding the site is predominantly rural, characterized by agricultural fields, hedgerows, and scattered residential properties. A map showing the approximate outline of the site and its surrounding environment is provided in **Figure 5.2**.

Figure 5.2: Map showing the site boundary. (Source: Google Satellite).

5.4.1.1 Land Use and Habitats Surrounding the Proposed Development

The surrounding area consists predominantly of agricultural fields, reflective of the rural character of this part of County Kildare. These fields are separated by hedgerows and small clusters of woodland, which contribute to the area's ecological value and provide natural boundaries between parcels of land. To the east of the site, beyond the M9 motorway, there is further evidence of agricultural land use and natural vegetation, reinforcing the predominantly rural setting.

Using up to date aerial photographs, an overview of the land-use and habitats surrounding the site was assessed and noted. The site is in a rural area where the predominant land use is intensive agriculture, and the dominant habitat associated with this use is improved agricultural grassland (Fossit Code: GA1). Other habitats represented in the wider area include semi-improved grasslands, hedgerows (WL1) and treelines (WL2). The nearest watercourse to the site is the Ballymoney stream located ca. 600- 700 m northeast of the proposed development. The surrounding area features a typical rural landscape, with hedgerows and drainage features dividing agricultural fields and scattered residential dwellings, as shown in **Figure 5.3**.

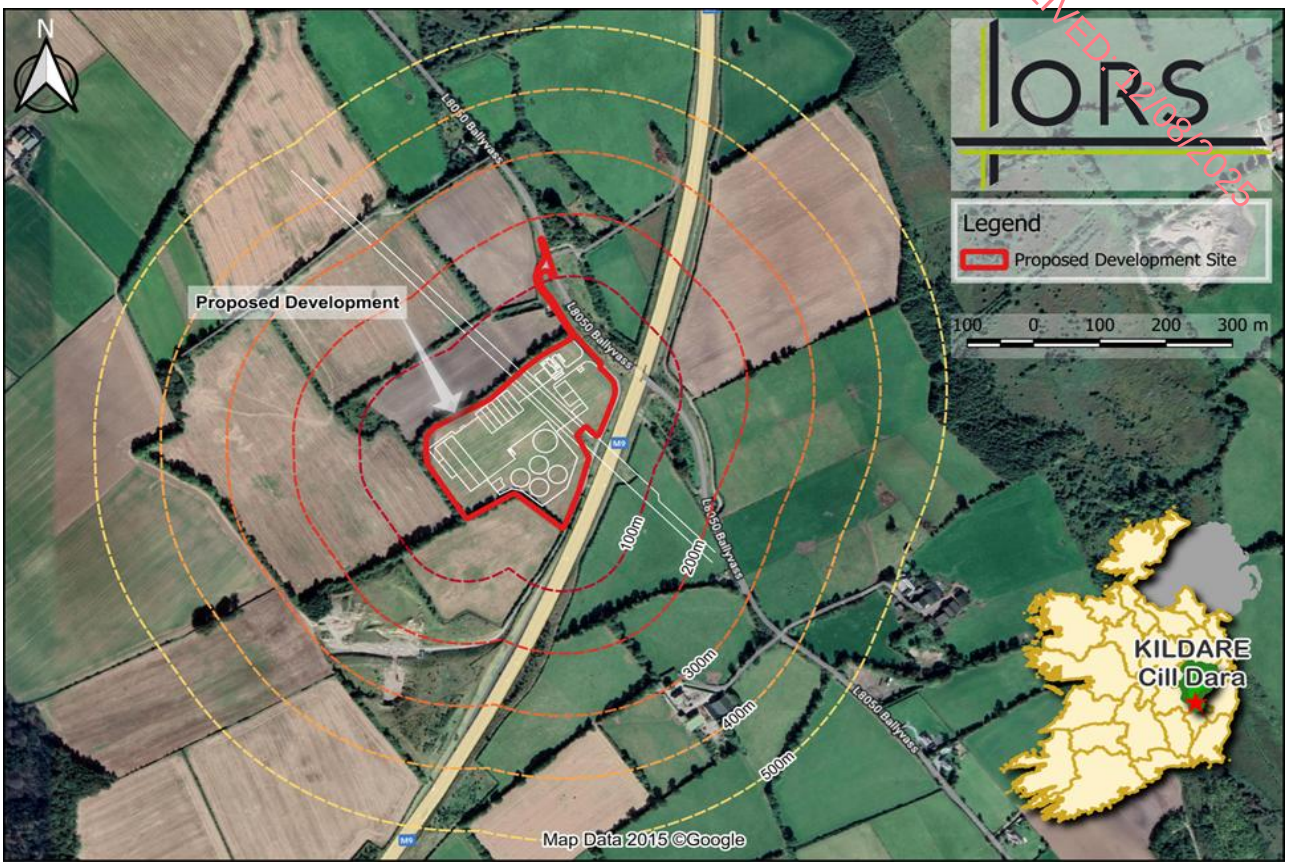

Figure 5.3 – Aerial Photograph Showing Habitats Surrounding the Study Area. Proposed Development Site is Outlined in Red.

5.5 Designated Sites

5.5.1 Natura 2000 Sites

The proposed 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.

There are 6 Natura 2000 designated sites within 15km of the application site. These designated areas and their closest points to the proposed development site are summarised in **Table 5.2** and a map showing their locations relative to the application site are shown in **Figure 5.4**. A full description of the sites can be read on the website of the National Parks and Wildlife Service (www.npws.ie).

Table 5.2: Natura 2000 Sites Within 15km of the Proposed Site

Site Name & Code	Distance	Qualifying Interests	Screened In / Out?
River Barrow and Nore SAC 002162	Located *ca*. 2 km from from proposed works.	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Reefs [1170] Salicornia and other annuals colonising mud and sand [1310] 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] European dry heaths [4030] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]	***Screened in*** *The proposed development site is hydrologically connected to the River Barrow and River Nore SAC via the Ballynamony Stream (BALLYNAMONY 14), located approximately 700 m northeast of the site. This stream ultimately discharges into the SAC, establishing a potential indirect pathway for impacts. Although the distance between the site and the SAC provides some spatial buffer, the presence of this hydrological linkage means that potential effects - particularly from surface water runoff or accidental pollutant release during construction or operation - cannot be definitively excluded at the screening stage.*

		Petrifying springs with tufa formation (*Cratoneurion*) [7220] 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] Desmoulin's Whorl Snail *(Vertigo moulinsiana)* [1016] Freshwater Pearl Mussel (*Margaritifera margaritifera)* [1029] White-clawed Crayfish (*Austropotamobius pallipes)* [1092] 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] Killarney Fern (*Trichomanes speciosum)* [1421]	
Slaney River Valley SAC 000781	Located *ca*. 9.5 km east from proposed works.	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140]	***Screened out*** Potential impacts and effects are unlikely. No pollution pathways exist and there will be no loss or disturbance of any habitats or species within this SAC. It is unlikely that

		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] *Lampetra planeri* (Brook Lamprey) [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]	there will be loss or disturbance of any habitats or species within this SAC due to good housekeeping and adherence to CEMP.
Holdenstown Bog SAC 001757	Located *ca*. 11.9 km southeast from proposed works.	Transition mires and quaking bogs [7140] Rhynchosporion [7150]	***Screened out*** Potential impacts and effects are unlikely. No pollution pathways exist and there will be no loss or disturbance of any habitats or species within this SAC. It is unlikely that there will be loss or

			disturbance of any habitats or species within this SAC due to good housekeeping and adherence to CEMP.

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 area it covers 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.

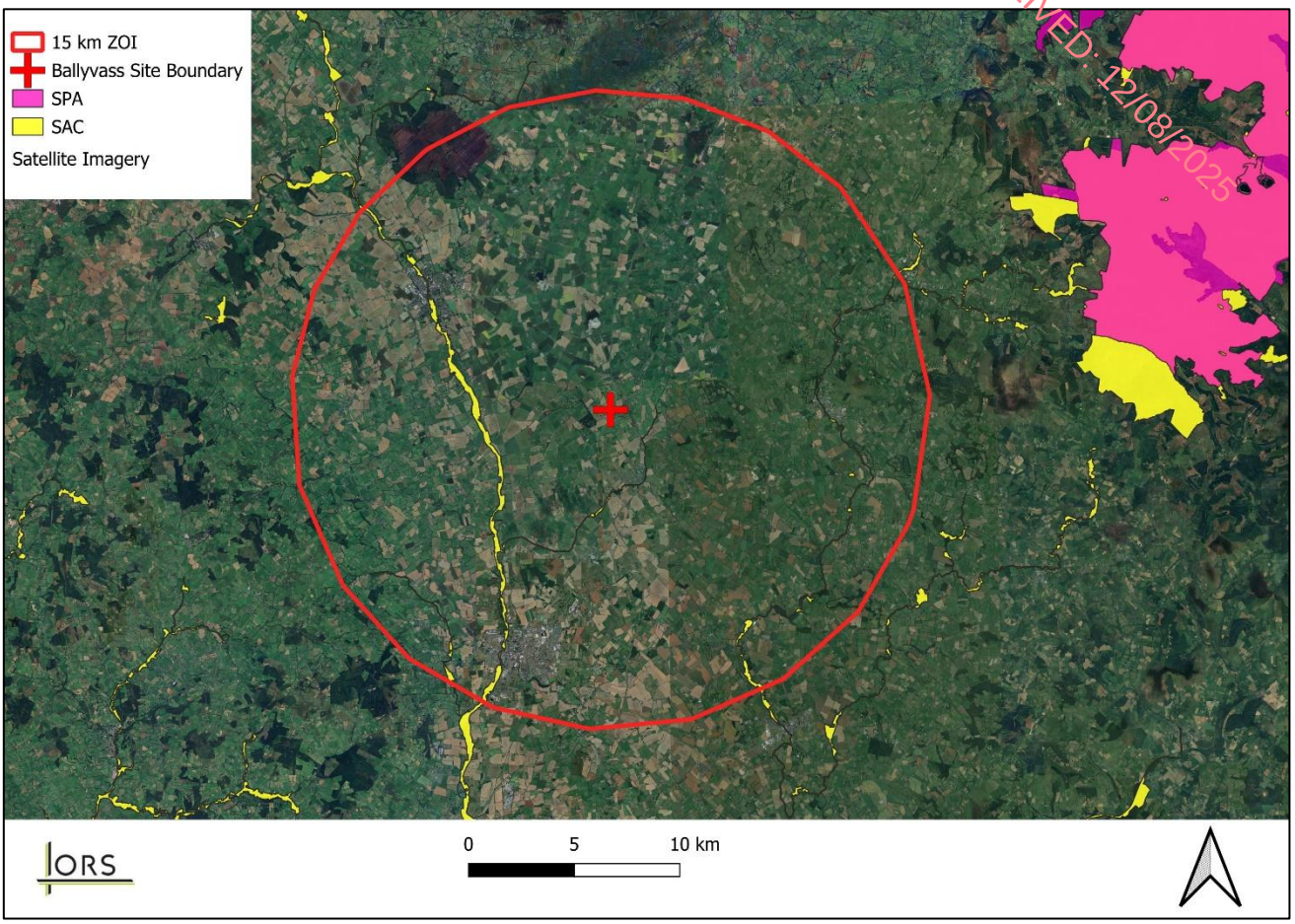

Figure 5.4 – Designated Sites within the Zone of Influence of the Proposed Development (Pinned).

5.6 Flora

5.6.1 Habitats within the Study Area

This section provides a detailed overview of the habitats within the Proposed Development site. A habitat map depicting the primary habitats in the proposed site area is presented in **Figure 5.5.** The Proposed Development site consists of a single large field that will accommodate the Anaerobic Digestion Facility. The site will be accessed via a new entrance to be constructed along the southern boundary, directly off the R518 regional road.

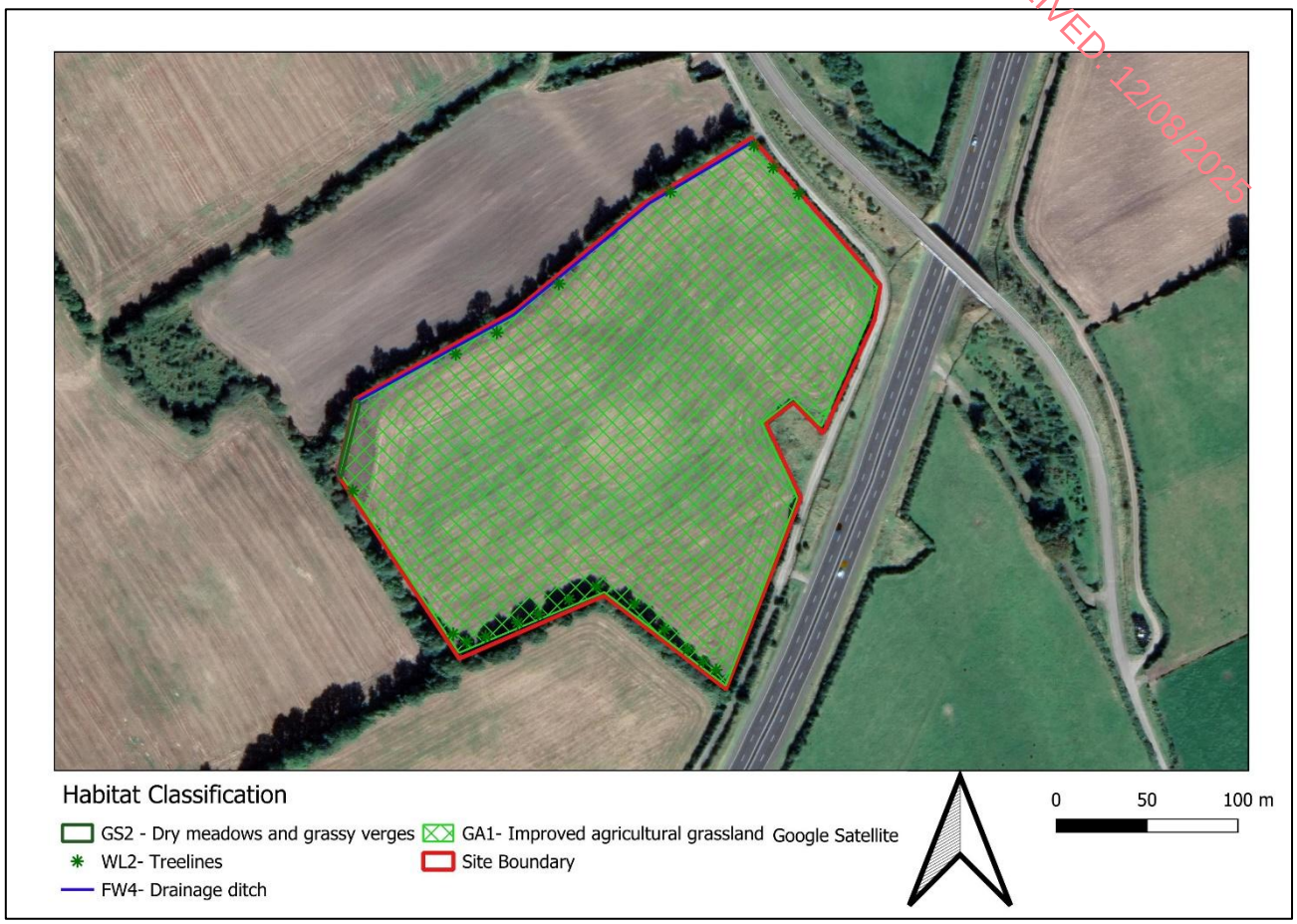

Figure 5.5 – Habitat Map of the Proposed Study Area.

The dominant habitat within the site is Improved Agricultural Grassland (Fossitt Code: GA1), which is regularly managed and of low ecological value due to its intensive past use and limited plant diversity. This grassland supports species typical of improved pastures, such as perennial ryegrass (*Lolium perenne*), white clover (*Trifolium repens*), and creeping buttercup (*Ranunculus repens*). The site boundaries are enclosed primarily by Treelines (Fossitt Code: WL2) with species such as Ash (*Fraxinus excelsior*) and Sycamore (*Acer pseudoplatanus*) observed.

Additionally, Dry Meadows and Grassy Verges (GS2) are present in the northwest boundary. These strips support a more diverse flora than the improved grassland, including species such as yarrow (*Achillea millefolium*), oxeye daisy (*Leucanthemum vulgare*), and meadow buttercup (*Ranunculus acris*).

A drainage ditch (Fossitt Code: FW4 - Drainage Ditches) was identified running along the northwestern boundary of the site. This ditch flows in a northeasterly direction and appears to act as a receptor for surface water run-off from the site. During the ecological walkover, surface water ponding was observed in this area, which was notably boggy, likely due to recent high rainfall. The ditch is likely to provide some limited value for invertebrates and amphibians.

This ditch ultimately drains in the direction of the Ballynamony Stream, which lies approximately 600- 700 m to the northeast and is hydrologically connected to the River Barrow and River Nore SAC.

No habitats of high conservation value were identified within the Proposed Development site itself. However, the presence of the drainage ditch and boundary vegetation adds some local ecological

value, and appropriate protection measures (e.g., silt fencing, buffer zones) will be implemented to avoid indirect impacts during construction.

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
European Privet	*Ligustrum vulgare*
Orchard grass	*Dactylis glomerata*
Railway bramble	*Rubus elegantispinosus*
Persian ivy	*Hedera colchica*
Grey willow	*Salix atrocinerea*
Stinging nettle	*Urtica diocia*
Pussy willow	*Salix cinerea*
Red elderberry	*Sambucus racemosa*
Common elder	*Sambucus nigra*
Hogweed	*Heracleum sphondylium*
Reed grass	*Phragmites australis*
Field thistle	*Cirsium arvense*
Field briar	*Rosa agrestis*
Apple rose	*Rosa villosa*
Hard rush	*Juncus inflexus*
False brome	*Brachypodium sylvaticum*
Atlantic ivy	*Hedera Hibernica*
Spear thistle	*Cirsium vulgare*
Great hairy willow herb	*Epilobium hirsutum*
Common watercress	*Nasturtium officinale*
Square stalked willowherb	*Epilobium tetragonum*
St Anthonys Turnip	*Ranunculus tubersud*
Stickywilly	*Galiumaparine*
Cow Parsely	*Anthriscus cerefolim*
Beech	*Fagus sylvatica*
Common Hazel	*Corylus avellana*
Bermudagrass	Cynodon dactylon
Caratao grass	*Axonopus fissifolius*
Broadleaf meadow grass	*Poa chaixii*
Chinese holly	*Osmanthus heterophyllus*
Sessile Oak	*Quercus petraea*
Spindle	*Euonymus europaeus*
Bushgrass	*Calamagrostis epigejos*
Hawthorn	*Crataegus monogyna*
Peat moss	*Spagnum*
Bracken	*Pteridium*
Rosehip	*Rosa canina*
Birch	*Betula*

5.6.1.1 Overall Evaluation of Habitats within the Proposed Development Site

The habitats within the Proposed Development site have been evaluated through field survey and desk study and are predominantly characterised as Improved Agricultural Grassland (*Fossitt Code: GA1*), which covers the majority of the site. This habitat has been intensively managed for grazing or silage production and is of low botanical diversity, offering limited ecological value for flora or fauna.

Other habitats identified include Hedgerows (WL1) and Treelines (WL2) along site boundaries, as well as a Drainage Ditch (FW4) located along the western site boundary. The hedgerows and treelines, while fragmented and species-poor in some sections, offer some ecological value as linear features providing connectivity across the landscape for birds, small mammals, and invertebrates. These boundary features may also serve as foraging and nesting habitat, particularly during the breeding season.

The drainage ditch, although modified and of limited flow at the time of the survey, may offer seasonal refuge and dispersal routes for amphibians and invertebrates, especially if water is retained during wetter months.

Overall, the habitats within the site are assessed as being of low to local conservation value, due to the predominance of improved grassland and generally species-poor, modified boundary features. However, the presence of semi-natural elements such as hedgerows, treelines, and the drainage ditch slightly elevate the ecological value of peripheral site areas.

5.6.1.2 Rare and Protected Plant Species

An examination of the website of the National Parks and Wildlife, the National Biodiversity Data Centre and the Online Atlas of Vascular Plants for Ireland revealed that there are no records for any plant species protected under the Flora Protection Order from within the 10km square of the Proposed Development. The habitats within the site are all highly modified and no protected plant species were noted within the Proposed Development site.

5.6.1.3 Invasive Species

An examination of the website of the National Parks and Wildlife, the National Biodiversity Data Centre and the Online Atlas of Vascular Plants for Ireland revealed a list of records of invasive species that are regulated for control under the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477) within the 10km grid square (R43) of the proposed development. These include, Butterfly bush (*Buddleja davidii*), Canadian Fleabane (Conyza canadensis), Cherry Laurel (*Prunus laurocerasus*), Indian Balsam (*Impatiens glandulifera*), Japanese Honeysuckle (*Lonicera japonica*), Japanese Knotweed (*Fallopia japonica*), Sycamore (*Acer pseudoplatanus),* Traveller's joy *(Clematis vitalba), Aphanomyces astaci.*

None of these species were recorded within a 2km Grid Square of the site nor were recorded during the fieldwork carried out by ORS during the field surveys.

5.7 Fauna

5.7.1 Protected Mammals

Records from the National Biodiversity Data Centre reveal the presence of the following protected mammals from within the 10km square (R43) of this Proposed Development site:

- Eurasian Badger (*Meles meles*).
- Brown Long eared bat (*Plecotus auritus*).
- Daubenton's Bat (*Myotis daubentoniid).*
- Eurasian pygmy shrew *(Sorex minutus).*
- Eurasian red squirrel (*Sciurus vulgaris*).
- European otter (*Lutra lutra*).
- Lesser noctule (*Nyctalus leisleri*).
- Nathusius's Pipistrelle (*Pipistrellus nathusii*).
- Natterer's Bat (*Myotis nattereri*).

- Pine Marten (*Martes martes*).
- Pipistrelle (*Pipistrellus Pipistrellus).*
- Soprano pipistrelle (*Pipistrellus pygmaeus*).
- West European Hedgehog (*Erinaceus europaeus*).

A custom polygon generated for the actual Proposed Development site revealed that European Badger (*Meles Meles*) have been recorded within a 2km square grid of the planning site. This species is protected under the Irish Wildlife Acts. The field survey of the Proposed Development site found no Badger setts present within the Proposed Development site, and no obvious worn tracks or trails that could be attributed to badgers were noted. There is little opportunity for badger setts in the Proposed Development site, however the habitats in the wider landscape are likely to be of local importance for all terrestrial mammals, including badgers.

5.7.2 Bats

5.7.2.1 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 25.11, which is moderate. **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).

Table 5.5 – Bat Suitability Index for the Proposed Development (NBDC)	
Bat Species	**Suitability Index**
All Species	25.11
Brown Long-Eared Bat (*Plecotus Auritus)*	43
Soprano Pipistrelle (*Pipistrellus Pygmaeus)*	29
Natterer's *Bat (Myotis Nattereri)*	30
Nathusius' Pipistrelle (*Pipistrellus Nathusii)*	6
Daubenton's Bat (*Myotis Daubentoniid)*	19
Whiskered Bat (*Myotis Mystacinus)*	32
Leisler's Bat (*Nyctalus Leisleri)*	33
Lesser Horseshoe Bat (*Rhinolophus Hipposideros*)*	0
Common Pipistrelle (*Pipistrellus Pipistrellus)*	34

** Annex II Species*

5.7.2.2 Bat Features within the Proposed Development Site

There are no buildings located within the proposed development site. The trees present across the site were assessed in relation to their potential to support roosting bats. While a number of mature trees are present, they are largely overgrown with ivy and lack suitable features such as cracks, cavities, or loose bark typically associated with bat roost potential. The ivy cover was dense and did not provide crevices of a type or scale likely to support bat roosts. As such, the trees within the site are considered to have negligible suitability for roosting bats.

5.7.3 Birds

Bird species of conservation concern were observed within the Proposed Development site during the site survey. While bird activity within the main agricultural field of the site was relatively low overall, a high number of Yellowhammer (*Emberiza citrinella*), a Red-listed species of high conservation concern, were observed. Additionally, Common Snipe, another Red-listed species, was recorded during the survey.

The following bird species (**Table 5.5**) were recorded during the survey, and their conservation status is listed according to Gilbert et al. (2021), where *green* indicates low conservation concern, *amber* indicates medium concern, and *red* indicates high concern:

Table 5.5: Bird Species Recorded on Site.

Species	Conservation Status
Blackbird (*Turdus merula)*	Green Status
Robin (*Erithacus rubecula)*	Green Status
Wren (*Troglodytes troglodytes)*	Green Status
Rook (*Corvus frugilegus)*	Green Status
Jackdaw (*Corvus monedula)*	Green Status
Hooded Crow (*Corvus conix*)	Green Status
Chaffinch (*Fringilla coelebs*)	Green Status
Common Snipe (*Gallinago gallinago*)	Red Status
Wood Pigeon (*Columba palumbus*)	Green Status
Dunnock (*Prunella modularis*)	Green Status
Yellow Hammer (*Emberiza citrinella)*	Red Status
Common Snipe (*Gallinago gallinago)*	Red Status
Buzzard (*Buteo buteo*)	Green Status

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

5.7.4 Amphibians, Reptiles and Invertebrates

No common frogs (*Rana temporaria*) were observed during the site walkovers, in both winter and summer. In summer months, the viviparous lizard (*Zootoca vivipara*) may bask on rocks or at the margins of pathways and agricultural roads within the site. No evidence of Slowworm (*Anguis fragilis*), such as individuals or characteristic burrows, was observed.

The improved agricultural grassland habitat within the Proposed Development site offers limited ecological value for pollinators and other invertebrates due to its intensively managed condition. However, unmanaged vegetated verges along the site boundaries, as well as established treelines, provide more structurally diverse habitats. These peripheral areas are likely to support foraging opportunities for pollinating insects, particularly during the late spring and summer months.

In addition, the drainage ditch located along the western boundary of the site may offer some seasonal habitat value for amphibians and invertebrates, particularly if it retains moisture or water

during wetter periods. While no amphibians were recorded during the survey, this linear feature could potentially function as a movement corridor or breeding site under suitable conditions. The broader surrounding landscape- including nearby watercourses and woodland areas—is also likely to provide more favourable and extensive habitats for amphibians, pollinators, and other invertebrate species.

5.8 Aquatic Environment

5.8.1 Water Features and Quality

5.8.1.1 Surface Waters – Water Framework Directive Status

Water Framework Directive (WFD) were consulted to assess the extent and quality of waterbodies present in the vicinity of the proposed development. The closest waterbody to the site consists of the Ballynamony stream (Ballynamony 14/ Code: IE_SE_14G040400) located 646 m to the east of the site. This stream runs northwest for approximately 2 kilometres until it joins the Greese River (IE_SE_14G040600), a tributary of the Barrow River and River Barrow and Nore SAC which are protected by national legislation.

The WFD runs in 6-year cycles with the most recent data being generated between 2016-2021. The Directive takes rivers, lakes, estuaries, groundwater and coastal waters into consideration and each waterbody can be awarded one of five statuses: High, Good, Moderate, Poor, and Bad. Additionally, waterbodies can be assigned a risk level (“At Risk”, “Not at Risk”, “Review”) which represents the risk of the waterbody of failing its WFD objectives by 2027.

Based on data available on EPA maps and in accordance with the Water Framework Directive, the Greese River (IE_SE_14G040600) has a WFD status of “moderate”, and the risk level stated as “At Risk”, indicating their ecological status and chemical status are precarious. In addition, Barrow River (IE_SE_14B012460) presents a WFD status of “moderate” and ‘at risk’.

The proposed site is located within the GREESE_050 Sub Basin; Barrow Hydrometric Area 14; Barrow Catchment; Greese_SC_010 Sub Catchment.

An overview of the ecological status of the watercourses in the area and surrounding catchments is presented in **Figure 5.6.**

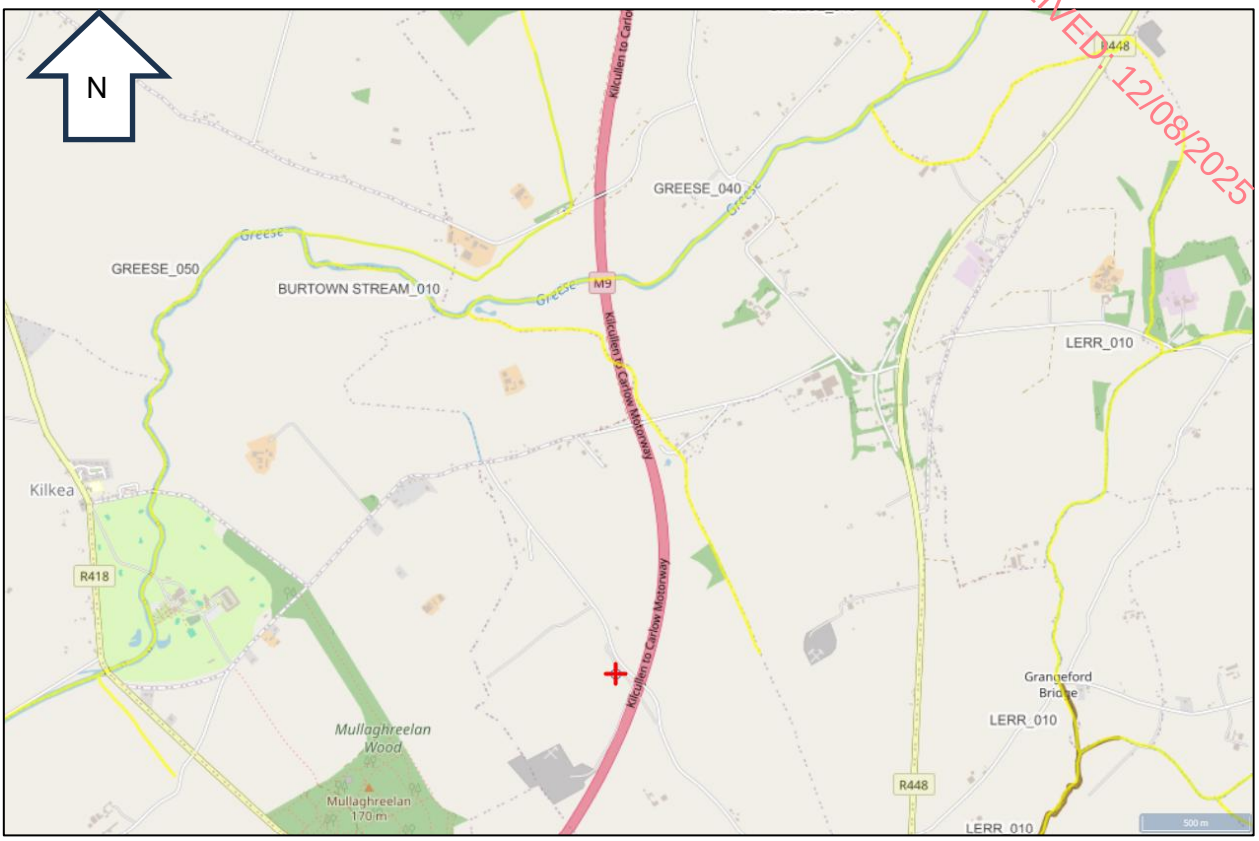

Figure 5.6 – The site location (Red Cross) and Local WFD Status [Green - Good Status; Yellow - Moderate Status; Red - Poor Status].

5.8.1.2 Surface Waters – Biological Quality Assessment

Table 5.6: Q Values Results of the nearest watercourse

Station ID	Q-Value	Ecological Status
Br NE of Belan House	Q3-4	Moderate
Kilkea Br	Q3	Poor

5.8.1.3 Ground Water

The Proposed Development site is within the Newross Groundwater Body and the status of this waterbody is noted as good. This groundwater body is considered as 'Not at risk'.

5.9 Ecological Evaluation

5.9.1 Summary of the Value of the Site

The Proposed Development site at Ballyvass, County Kildare is within the Zone of Influence of three sites designated under the Natura 2000 network (SACs / SPAs). The closest of these is the River Barrow and River Nore SAC located ca. 2km south of the proposed site.

In addition, there is a drainage ditch located along the northwest boundary of the site, which flows in a northeasterly direction towards the Ballynamony stream, located ca. 600 m northeast of the site. This stream is hydrologically connected to the River Barrow and River Nore SAC. The hydrological connectivity between these areas is *ca*. 6 km. Although the drainage ditch is not mapped by the EPA, site observations confirmed surface flow and ponding during recent rainfall, indicating an active hydrological pathway that may convey surface water runoff and suspended solids during site clearance and construction.

The Proposed Development site is also within 15km of nine sites designated as Natural Heritage Areas (NHAs and pNHAs). The closest of these is the Corballis Hill pNHA, which is 5 km east of the Proposed Development site.

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 5.7** lists the habitats that have been described within the Proposed Development site and their associated ecological value, based on the NRA guidelines.

Table 5.7: 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
Dry Meadows and Grassy Verges- GS2	Local Importance (Higher Value)	Essential in maintaining links and ecological corridors between features of higher ecological value. Provides value for local populations of birds, mammals and bats.
Treelines - WL2	Local Importance (Higher Value)	Act as ecological corridors facilitating the movement of species, particularly bats, birds, and small mammals. Provide nesting, roosting, and foraging opportunities.
Drainage Ditch – FW4	Local Importance (Higher Value)	Act as wildlife corridors, supporting diverse aquatic and terrestrial life.

5.10 Impact Assessment

The information gathered as part of the desk study and field survey for this proposed application 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 in Ballyvass, Kildare 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).

5.11 Impacts upon Designated Sites

5.11.1 Natura 2000 Sites

A comprehensive assessment of the potential significant effects of the proposed works for a proposed Anaerobic Facility, Ballyvass, County Kildare was carried out in November 2024 and August 2025 by a team of ORS Ecological 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 significant risks to Natura 2000 sites at the proposed development at Ballyvass, Kildare cannot be ruled out due to a hydrological connection via a stream ca. 600m northeast of the site and the River Barrow and river Nore SAC approximately 6km from the proposed site. Therefore, a Natura Impact Statement (NIS) was required under Article 6(3) of the Habitats Directive.

With the implementation of the mitigation measures contained in this EcIA and the NIS, the current application will have no cumulative impacts upon the River Barrow and River Nore SAC site when considered in combination with other developments that are adequately screened for AA or where mitigation measures have been included as part of a Natura Impact Assessment.

5.11.2 Natural Heritage Areas

The Proposed Development will not lead to the loss or fragmentation of protected habitats within any pNHA or NHA.

5.11.3 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.

5.11.4 Habitat Loss and Fragmentation

The dominant habitat within the Proposed Development site is Improved Agricultural Grasslands. 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 mature vegetation along the perimeters of the Proposed Development site 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.

5.11.5 Impacts on Local Wildlife

In the absence of mitigation, any removal of vegetation within the field 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.

During site preparation and construction, local populations of mammals may be disturbed by the increase in noise, traffic and human activity. Increased nighttime lighting could particularly impact local bat populations, disrupting their foraging behaviour. Nocturnal mammals such as foxes, badgers, and small rodents may experience disturbances from continuous noise during movement or foraging, and some species may avoid the area altogether if noise levels are high enough. Bats, which rely on echolocation for hunting, are particularly vulnerable to prolonged exposure to low-frequency noise, which could interfere with their navigation and foraging abilities, leading to reduced activity in the area.

There will be no loss or fragmentation of any habitats used by roosting or hibernating bats during construction.

There are no significant effects anticipated for Amphibians, Reptiles and Insects.
In the absence of appropriate design and mitigation measures, local wildlife could be impacted by noise and lighting disturbances. Birds, generally more sensitive to noise during the day, may be disturbed if they roost near the site, although they can typically adapt to moderate background noise. Long-term effects are unlikely unless the noise is exceptionally loud or intermittent.

5.11.6 Pollution to Surface and Ground Water

Site preparation and construction will occur on lands that are ca. 600- 700 m from the Ballynamony stream. Additionally, an active drainage ditch on the northwest boundary conveys surface water from the site directly toward the stream, providing a pathway for indirect pollution during heavy rainfall or ground disturbance. 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 high groundwater vulnerability. Any deep excavations that are required for the construction could lead to pollution of the groundwater with hydrocarbons or other pollutants.

5.11.7 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.

5.11.8 Impacts on Local Wildlife

In the absence of appropriate design and mitigation measures, local wildlife could be impacted by noise and lighting disturbances. Birds, generally more sensitive to noise during the day, may be

disturbed if they roost near the site, although they can typically adapt to moderate background noise. Long-term effects are unlikely unless the noise is exceptionally loud or intermittent.

Mammals may also be affected, with human activity potentially causing disturbances. Increased nighttime lighting could particularly impact local bat populations, disrupting their foraging behaviour. Nocturnal mammals such as foxes, badgers, and small rodents may experience disturbances from continuous noise during movement or foraging, and some species may avoid the area altogether if noise levels are high enough. Bats, which rely on echolocation for hunting, are particularly vulnerable to prolonged exposure to low-frequency noise, which could interfere with their navigation and foraging abilities, leading to reduced activity in the area.

5.11.9 Pollution to Surface and Ground Water

Run off from impermeable areas within the site could be mobilised toward the drainage ditch, and subsequently the Ballynamony stream. In addition, structural weaknesses in tanks could lead to groundwater pollution.

5.11.10 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.

5.12 Cumulative Impacts

Cumulative impacts or effects are changes in the environment that result from numerous human-induced, small-scale alterations. Cumulative impacts can be thought of as occurring through two main pathways: first; through persistent additions or losses of the same materials or resource, and second, - through the compounding effects as a result of the coming together of two or more effects (*Bowers-Marriott, 1997*).

The proposed development may have cumulative impacts upon designated sites when considered in combination with other developments that have been screened properly for AA (Stage I) or where AA has taken place (Stage II). Any future individual application that has the potential to impact upon a Natura 2000 site will be subject to Appropriate Assessment as required under Article 6(3) of the Habitats Directive.

Key nearby developments include:

- Sand and Gravel Pit: A 4.89-hectare extension with processing/storage facilities (4.681 ha), and restoration to agriculture (9.571 ha total). Planning permissions (Reg. Ref. 05/2340 and extension Ref. 15/125) have expired without works being completed.

- Smaller Developments: Minor projects, such as a new dwelling with a garage and treatment system (Ref. 16346) and a septic tank installation (Ref. 181575), are unlikely to cause significant cumulative ecological effects.

The creation of new areas of biodiversity within the Proposed Development site and the retention and protection of the existing hedgerows will enhance local ecological corridors and networks, mitigating the overall cumulative impact of this development in the Ballyvass area.
Combined with appropriate screening for Natura 2000 sites under Article 6(3) of the Habitats Directive, these measures will mitigate cumulative ecological impacts in the Ballyvass area.

5.13 Mitigation Measures

In order to avoid any reductions in water quality in the area surrounding the Proposed Development site in Ballyvass, Kildare, several mitigation measures must be implemented and followed. These measures will protect the surface and groundwater locally and will subsequently prevent significant effects on the drainage ditch, the Ballynamony stream and ultimately the SAC. 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 Natura 2000 habitats and species, and 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.

5.13.1 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 and in the separate NIS. 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 River Nore and River Barrow. 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.

5.13.2 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 stonewalls 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.

- Any small tree or shrubs that require removal should be removed outside of the bird nesting season (March – August).

- The laying of the gas pipe from the Proposed Development must result in the minimal disturbance to existing roadside hedgerow vegetation. 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.

5.13.3 Mitigation Measures during Construction

5.13.3.1 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 runoff from the site during construction and operation. These works should be overseen by an ecological clerk of works.

- It is vital that there is no deterioration in water quality at the Lower Ballynamony stream or associated drains. 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.
- It is important that efficient construction practices and sequences are employed, and this will minimise soil erosion and potential pollution of the drainage ditches with soil and sediment. Unnecessary clearance of vegetation should be avoided. These works should be overseen by an ecological Clerk of Works.
- Works 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 Ballynamony stream or any drains that lead to this river. Therefore, it is recommended that silt fences are installed along the northwestern and northeastern extent of the construction site area. The silt fence 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. The silt fences must be capable of preventing particles of 425mm from passing though. The footing of the fencing to be buried into the ground and the visible fencing to be ca. 0.5m high.
- 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.
- The concrete washout skip is to be located to the east of the site, where the underlying overburden is greater.
- 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.
- Landscaping should be carried out as soon as possible to minimise weathering.
- Sustainable Urban Drainage Systems (SuDS) such as swales, permeable surfaces, and vegetated buffer strips should be incorporated to slow and filter runoff.
- Sustainable Urban Drainage Systems (SuDS), including swales, vegetated buffer strips, and permeable surfaces, will be integrated to slow and treat runoff.
- A temporary drainage system will be established complete with oil interceptors and settlement ponds to remove contaminants from run-off, prior to discharge off-site.
- Stockpile areas for sands and gravel should be kept to minimum size, well away from storm water drains and gullies leading off-site, and the Ballynamony stream.
- Covers are to be provided over soil stockpiles when high wind and inclement weather are encountered if required.
- Harmful materials and stockpiles should be stored well away from the drainage ditches on-site.

5.13.3.2 Management of Construction Waste and Soil

- All construction waste must be removed from site by a registered contractor to a registered site. 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.

- 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.

5.13.3.3 Accidental Spills of Harmful Substances

All spill prevention measures are designed to prevent any release of hydrocarbons or contaminants to surface water or groundwater, thereby protecting the QIs of the River Barrow and River Nore SAC:

- Establishment of bunded oil and chemical storage areas.
- Refuelling of mobile plant in designated areas provided with spill protection.
- Fuel bowsers to be in bunded areas which can cater for 110% of the primary vessel capacity or 25% of the total volume of the substance which could be stored withing the bunded area and to be located away from the drainage ditches.
- Only appropriately trained site operatives permitted to refuel plant and machinery on site.
- Regular inspections carried out on plant and machinery for leaks and general condition.
- Emergency response plan.
- Spill kits readily available throughout the site.
- Use of ready-mixed supply of wet cement products.
- Scheduling cement pours for dry days

5.13.3.4 Management of Noise Pollution to minimise disturbance

The assigned registered contractor will be obliged to comply with BS 5228 “Noise Control on Construction and open sites Part 1”, and shall implement the following measures to eliminate or reduce noise levels where possible:

- The best means practicable, including proper maintenance of plant and machinery, will be employed to minimise the noise produced by on site operations.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working for the duration of the contract.
- Compressors will be attenuated models, fitted with properly lines and sealed acoustic convers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.
- During the construction programme, supervision of the works will be include ensuring compliance with noise limits, using methods outlined in BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise.
- All site staff shall be briefed on noise mitigation measures and the application of best practicable means to be employed to control noise.
- Ensure that each item of plant and equipment complies with the noise limits quoted in the relevant European Commission Directive 2000/14/EC.
- Use all plant and equipment only for the tasks for which it has been designed.
- Locate movable plant away from noise sensitive receptors, specifically, hedgerows, treelines, and the drainage ditches on site.

5.13.4 Mitigation Measures during Operation

5.13.4.1 Environmental Management System (EMS)

An Environmental Management System (EMS) will be prepared and implemented by the operating company during the operational phase.

The EMS will serve as a framework to ensure the effective delivery, monitoring, and maintenance of the mitigation measures that are specified in the NIS and committed to as part of the planning consent. All mitigation measures described in the NIS to avoid adverse effects on the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA will be incorporated in full into the EMS and implemented prior to and during operation. The document 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 the event of a grant of licence by the EPA to carry out activities that require such licence, it is expected that the licence will contain several conditions which the operator must remain in compliance with for the entire duration of the facility's lifespan. Typical conditions relating to the protection of 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 direct 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.
- Bunds and tanks will be constructed in compliance with Eurocode BS EN 1992-3:2006 for watertightness and structural integrity.

5.13.4.2 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:

- Treelines and hedgerows that are to be retained will be protected and enhanced where possible to support local biodiversity. Enhancements will include gap planting with native

species, retention of existing mature trees, and installation of bird and bat boxes where appropriate. Buffer planting using native shrubs or wildflower margins can further improve habitat quality. Trees such as willow provide early sources of pollen for bees, as would fruit blossoms such as crab apple and wild cherry. Planting should focus on providing year-long interest for pollinators. Planting should be delivered in accordance with the Landscape Plan which accompanies the application.

- Any necessary hedgerow/ tree removal will be carried out outside of the bird nesting season (March to August). Where feasible, compensatory planting of native hedgerows will be incorporated elsewhere within the site boundary, in accordance with the Landscape Plan.

- 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.

- Management of retained and new planting will avoid disturbance during the bird nesting season and include long-term maintenance to prevent habitat degradation. Planting will focus on providing year-round interest for pollinators and native species. All planting will be delivered in accordance with the Landscape Plan which accompanies this application.

- The landscaping and planting scheme for the site will incorporate actions from the All-Ireland Pollinator Plan (AIPP), specifically the Farmland Guidelines. This will include provision of native flowering plants to support pollinators, creation of wildflower margins where feasible, and management of grassland areas to allow flowering. The selected measures will be incorporated into the Landscape Plan and will be implemented in full during site landscaping and maintained thereafter.

- 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 will 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 are proposed to 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 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 should 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 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 drainage ditches.

- 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.
    - 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.

5.13.5 Use of the Biobased Fertilisers by Customer Farmers

- In order to avoid any reductions in water quality within the catchment, 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 be kept by the farmer and routinely provided to the Applicant for verification.

- All biobased fertiliser will be pasteurised in accordance with Regulation (EU) 142/2011 prior to distribution for land spreading.

5.14 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.

5.14.1 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 5.8.**

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.***

5.14.2 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 5.9.**

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***.

5.14.3 Conclusion

With the recommended mitigation measures, it can be concluded that the Proposed Development site at Ballyvass, County Kildare 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.

Table 5.8 - Summary of predicted construction phase effects, mitigation measures and residual impact.

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 to 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 development of passing bays may result in the loss of hedgerows and grassy verges along the roadside.	Negative	Slight	Temporary	• Roadside hedgerows must be left intact where possible, and the root systems of these hedgerows must not be damaged. • If removal is unavoidable, replacement native hedgerow planting (e.g. Hawthorn, Blackthorn, Hazel) should be implemented along the site boundary or within green buffer areas as soon as possible. • 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., treelines 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). • In order to maintain dark Corridors for Bats, no artificial lighting directed toward hedgerows, trees, or the Ballyteige stream. Warm white LED lighting must be used (< 2700K, no UV, peak wavelength > 550 nm). • Install downward- facing lights only, with shield to prevent light spill into natural areas. • Ensure tree crowns remain unilluminated • The best means practicable, including proper maintenance of plant and machinery, will be employed to minimise the noise produced by on site operations.	**Neutral, Slight, Temporary**

						• All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working for the duration of the contract. • Compressors will be attenuated models, fitted with proper lines and sealed acoustic convers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. • During the construction programme, supervision of the works will be include ensuring compliance with noise limits, using methods outlined in BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise. • All site staff shall be briefed on noise mitigation measures and the application of best practicable means to be employed to control noise.	

Pollution to Surface and Ground Water	**Surface Water** Ballynamony Stream and receptors of the River Barrow and River Nore SAC (6 km 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 Ballynamony 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	• 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. • Works should be avoided during periods of heavy rainfall. • 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	**Neutral, Slight, Temporary**

						manufacturer's instructions. • 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 Ballynamony stream or any drains that lead to this stream. Therefore, it is recommended that silt fences are installed along the northwest and northeast extent of the construction site area. • All construction waste removed from site by a registered contractor to a registered site. Evidence of the movement and safe disposal of the construction waste must be retained. Removal of the construction waste should occur as soon as possible after construction works. • Establish a designated concrete washout area at least 20 m from water features. •	

						• Ready-mixed concrete will be used to reduce the risk of on-site handling and waste. • Sustainable Urban Drainage Systems (SuDS) will be installed to filter and slow surface water prior to discharge.	

	Groundwater Newross Groundwater Body	The site is in an area of high 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. • All chemicals must be stored as per manufacturer's instructions. A dedicated chemical store within a building must be	**Neutral, Slight, Temporary**

						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 5.9: Summary of predicted operational 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 (notably the lesser horseshoe bat) and other nocturnal mammals.	**Negative**	**Slight**	**Long term**	• Treelines and hedgerows that are to be retained will be protected and enhanced where possible to support local biodiversity. Enhancements will include gap planting with native species, retention of existing mature trees, and installation of bird and bat boxes where appropriate. • Buffer planting using native shrubs or wildflower margins can further improve habitat quality. Management should avoid disturbance during the bird nesting season and include long-term maintenance to prevent habitat degradation. Planting should focus on providing year-long interest for pollinators. Planting should be delivered in accordance with the Landscape Plan which accompanies the application. • 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 could 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.	**Neutral, Slight, Long term**

						• Bat boxes could 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 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 should 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. • A bat-sensitive lighting design will be implemented including downward-facing luminaires, <2700K LED only, unilluminated treetops, and maintenance of dark corridors. • There should be no lighting directed from the site towards mature vegetation or the drainage ditches. • 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. • 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. • Feedstock will only be accepted between the hours of 0700 and 1900 Monday to Friday, and 0700 to 1600 on Saturday, in order to minimise noise disturbances to nocturnal wildlife such as bats, during their active hours. • The best means practicable, including proper maintenance of plant and machinery, will be employed to minimise the noise produced by on site operations. • All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working for the duration of the contract. • Compressors will be attenuated models, fitted with properly lines and sealed acoustic convers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. • Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use. • During the construction programme, supervision of the works will be include ensuring compliance with noise limits, using methods outlined in BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and	

						open sites – Noise. • All site staff shall be briefed on noise mitigation measures and the application of best practicable means to be employed to control noise. • Ensure that each item of plant and equipment complies with the noise limits quoted in the relevant European Commission Directive 2000/14/EC. • Use all plant and equipment only for the tasks for which it has been designed. • Locate movable plant away from noise sensitive receptors, specifically, hedgerows, treelines and the drainage ditches on site.	
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 Ballynamony 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 • Monitoring requirements for surface	**Neutral, Slight, Long term**

						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.	

						• Firewater retention capacity will be provided via harvesting tanks and bunds, with isolation valves activated automatically in the event of fire. • All bunds will be designed and constructed in accordance with BS EN 1992-3:2006 (Eurocode) for watertightness. • Site-specific stormwater discharge trigger levels will be developed for early detection of pollution risks.	

Table 5.10: Summary of predicted operational phase effects, mitigation measures and residual impact.

Appendix A: References

Bailey, M. & Rochford, J. (2006) Otter survey of Ireland 2004 / 2005. Irish Wildlife Manuals No. 23. National Parks & Wildlife Service. DoEHLG.

Bowers Marriott, B. (1997) Practical Guide to Environmental Impact Assessment: A Practical Guide. Published by McGraw-Hill Professional, 1997, 320 pp.

CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. CIEEM, 2018

Cummins, S; Fisher, J; Gaj McKeever, R; McNaghten, L & Crowe, O. (2010) Assessment of the Distribution and abundance of Kingfisher Alcedo atthis and other riparian birds on six SAC river systems in Ireland. NPWS & Birdwatch Ireland.

Department of the Environment, Heritage and Local Government (2009) Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities.

Dwyer, (2000) Protecting Nature in Ireland, The NGO Special Areas of Conservation Shadow List. Published by the Irish Peatland Conservation Council, Dublin.

EPA (2001) Parameters of Water Quality - Interpretation and Standards. Environmental Protection Agency, Ireland.

EPA (2002) Guidelines on the Information to be contained in Environmental Impact Statements. Environmental Protection Agency, Ireland.

EPA (2003) Advice Notes on Current Practice in the Preparation of Environmental Impact Statements. EPA, Wexford, Ireland.

EPA (2012) Guidance on the setting of trigger values for storm water discharges to off-site surface waters at EPA licensed IPPC and waste facilities. EPA, Wexford.

Fossit, J.A. (2000) A Guide to Habitats in Ireland. The Heritage Council, Ballinrobe.
Hayden, T. & Harrington, R. (2000) Exploring Irish Mammals. Dúchas the Heritage Service, Town House Dublin.

Institute of Environmental Assessment (1995) Guidelines for Baseline Ecological Assessment. Institute of Environmental Assessment, Great Britain.

IUCN (2003) Red List of Threatened Species. International Council for Conservation of Nature and Natural Resources.

Kurz, I. and Costello, M.J. (1999) An Outline of the Biology, Distribution And Conservation Of Lampreys in Ireland. F. Marnell (ed.), Irish Wildlife Manuals, No. 5.

Ó Néill L. (2008) Population dynamics of the Eurasian otter in Ireland. Integrating density and demography into conservation planning. PhD thesis. Trinity College, Dublin.

Natura Environmental Consultants (2005) Draft Habitat Survey Guidelines: A Standard Methodology for Habitat Survey and Mapping in Ireland. The Heritage Council, Ballinrobe.

ORS

NPWS (2008) Conservation Status in Ireland of Habitats and Species listed in the European Council Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC

NRA (2004) Guidelines for Assessment of Ecological Impacts of National Road Schemes. National Roads Authority, Dublin.

Smith G. F., O'Donoghue P., O'Hora K. and Delaney E. (2010.) Best Practice Guidance for Habitat Survey and Mapping. Heritage Council.

Whilde, A. (1993) Threatened Mammals, Birds, Amphibians and Fish in Ireland. Irish Red Data Book 2: Vertebrates. HMSO, Belfast.