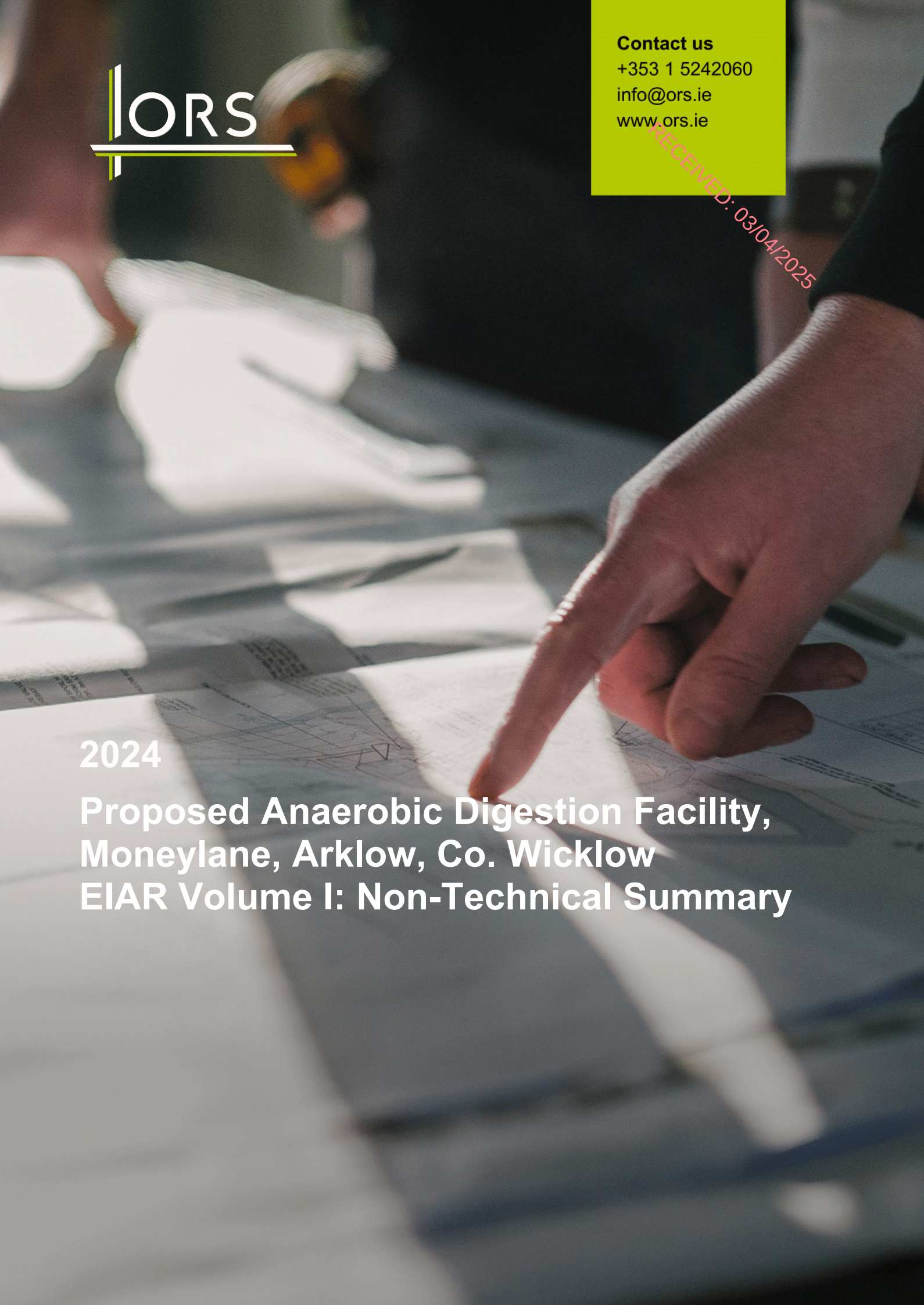
Contact us
+353 1 5242060
info@ors.ie
www.ors.ie



2024

Proposed Anaerobic Digestion Facility, Moneylane, Arklow, Co. Wicklow
EIAR Volume I: Non-Technical Summary

Proposed Anaerobic Digestion Facility, Moneylane, Arklow Co. Wicklow

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Document Control Sheet

Client:	Mr. Seoirse McGrath and Nephin Renewable Gas - Moneylane Limited (the Applicant)
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ORS

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1 Introduction

1.1 Introduction

Mr. Seoirse McGrath and Nephin Renewable Gas - Moneylane Limited (the Applicant) are pleased to submit this EIAR in support of a planning application for the construction and operation of an Anaerobic Digestion Facility at a site in the townlands Moneylane, Arklow, Co. Wicklow.

Occupying an area of circa 4.02 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 (renewable natural gas) suitable for direct injection into the Gas Network Ireland (GNI) distribution network. The renewable natural gas (RNG) produced at the facility will be used as a direct replacement for conventional natural gas and in doing so contribute towards the Government's Climate Action Plan to develop 5.7TWh of indigenous biomethane production by 2030. In addition to RNG, the facility will produce a nutrient rich biobased fertiliser which can be used as a direct replacement for fossil fuel derived fertiliser. The facility will also be specified for the recovery of biogenic carbon dioxide (CO_2).

The proposed development will consist of the following:

- Construction of 3 no. digesters (c. 15.5m in height), 2 no. digestate storage structures (c. 15.5m and 12m in height), 4 no. pump houses (c. 2.59m in height), a liquid feed tank (c. 4m in height), located in the northeastern section of the site.
- Construction of 4 no. pasteurisation tanks (each c. 6m in height), a post pasteurisation cooling tank (c. 4m in height) and pre fertiliser manufacturing tank (c. 4m in height) located in the centre of the site.
- Construction of a part single-storey and part two-storey reception hall (with a gross floor area (GFA) of c. 2,113 sq.m and an overall height of c. 16.5m) to accommodate reception and storage areas, a laboratory, panel room, tool store, workshop, located in the northwestern section of the site.
- Construction of a single-storey solid digestate storage and a nutrient recovery building (with a GFA of c. 880 sq.m and an overall height of c. 12.4m) located to the south of the reception hall, in the central section of the site.
- Odour abatement plant and equipment and a fuel tank will be provided to the south of the solid digestate storage and nutrient recovery building.
- 2 no. CO_2 tanks (c. 10.7m in height), a CO_2 loading pump (c. 2.5m in height), CO_2 auxiliaries (c. 2.6m in height), CO_2 liqueufactor (c. 8.2m in height), a CO_2 compressor (c. 5.9m in height), a CO_2 pre-treatment skid (c. 3.5m in height), and associated plant including a backup boiler / biomethane boiler and a Compressed Natural Gas compression unit / biogas compression system located in the southern portion of the site.
- A H_2S washing tower (c. 7.8m in height), a biogas treatment skid (c. 4.1m in height), a combined heat and power (CHP) unit and panel room (c. 10m in height), a biogas compression system, a biogas upgrading module, and an emergency biogas flare (c. 11.3m in height), also located within the southern section of the site.

- Construction of a two-storey office and administration building with an overall height of c. 8.5m and a GFA of c. 272sq.m, located within the western area of the site, adjacent to the main site access.
- Construction of a grid injection unit (c. 2.75m in height) within a fenced compound, an ESB substation (c. 3.4m in height and a GFA of c. 23.5 sq.m), and 2 no. propane tanks located in the south-western portion of the site.
- Alterations to the existing public road (c. 475m to the south of the main site area) including provision of boundary setbacks and replacement planting, providing a new site entrance and access road to serve the development.
- Associated and ancillary works including parking (6 no. standard, 3 no. EV and 1 no. disabled parking spaces and bike storage for 10 no. bikes), a weighbridge, solar PV arrays at roof level, wastewater treatment equipment, bunding and surface treatments, attenuation pond, boundary treatments, lighting, services, lightning protection masts, drainage, landscaping, and all associated and ancillary works.

A detailed description of the Proposed Development is provided in **Chapter 2 – Project Description** of Volume I: EIAR.

1.2 The Applicant

Mr. Seoirse McGrath and Nephin Renewable Gas - Moneylane Limited (the Applicant).

Mr. Seoirse McGrath is a local landowner and progressive farmer who owns and manages a dairy farm. The farm has been in the family's ownership since at least 1761. The McGrath family were the overall winners of the Glanbia Quality Milk Awards in 2007, and Saoirse McGrath was the winner of the Wicklow FBD Young Farmer of the Future in 2002. The farm is located ca. 100m from the Proposed Development.

Nephin Renewable Gas is a renewable energy company, located in Tipperary Town, Co. Tipperary. Nephin Renewable Gas is part of Nephin Energy, Ireland's largest gas production company. Nephin Energy produces indigenous natural gas and currently provides approximately 25% of the daily gas demand in Ireland. Nephin Renewable Gas is committed to making a meaningful contribution to the decarbonisation of Ireland's gas supply by developing *ca*. 1.2TWh of indigenous Irish biomethane, creating offtake opportunities of significant scale for large energy users.

Nephin Renewable Gas aims to become Ireland's largest producer of indigenous biomethane, building on the Group's existing position as Ireland's largest producer of domestic natural gas.

1.3 Site Location

The Proposed Development site (herein referred to as 'the site') is located in the townland of Moneylane, Arklow, Co. Wicklow approximately 1.9km southeast of the town of Arklow, Co. Wicklow and approximately 2.1km southwest of Wicklow Town, Co. Wicklow. The approximate grid reference location for the centre of the site is T 22154 72252, ITM: 722094, 672281. The site location is depicted in **Figure 1.1**.

An overview of the site location is provided in **Figure 1**.

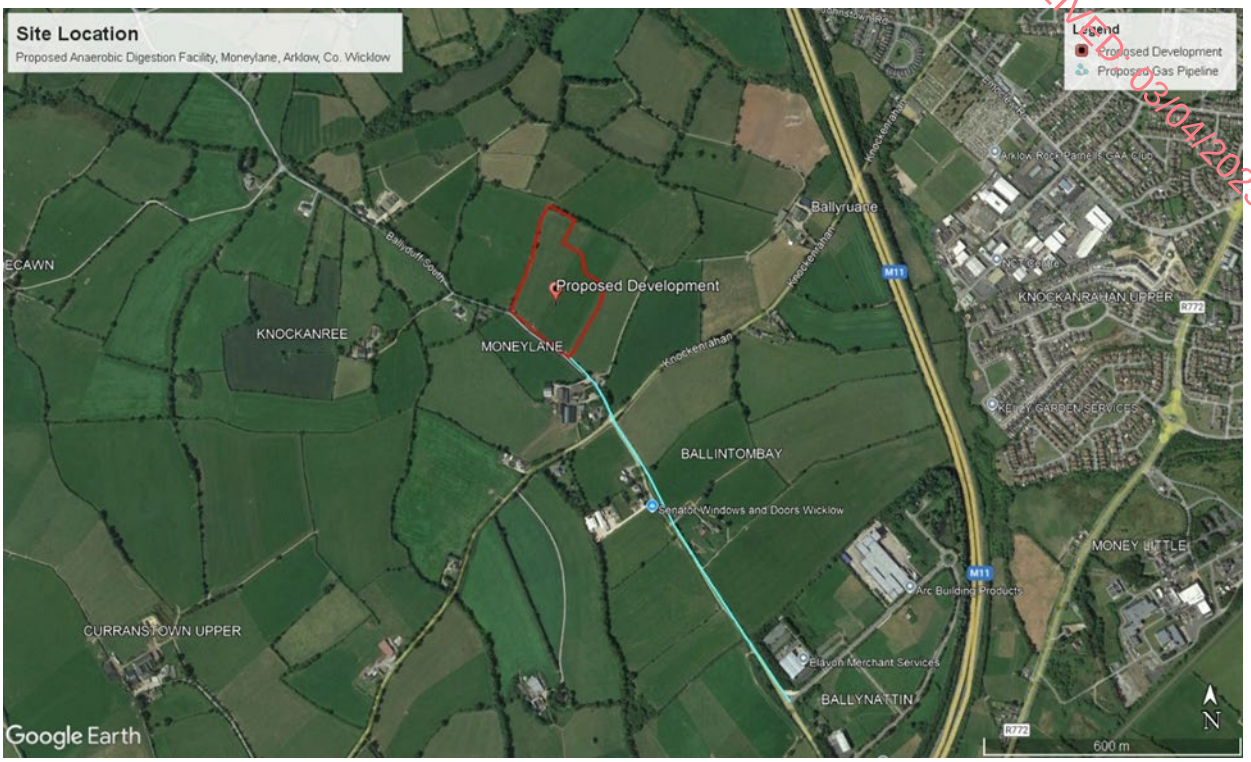


Figure 1: Site Location

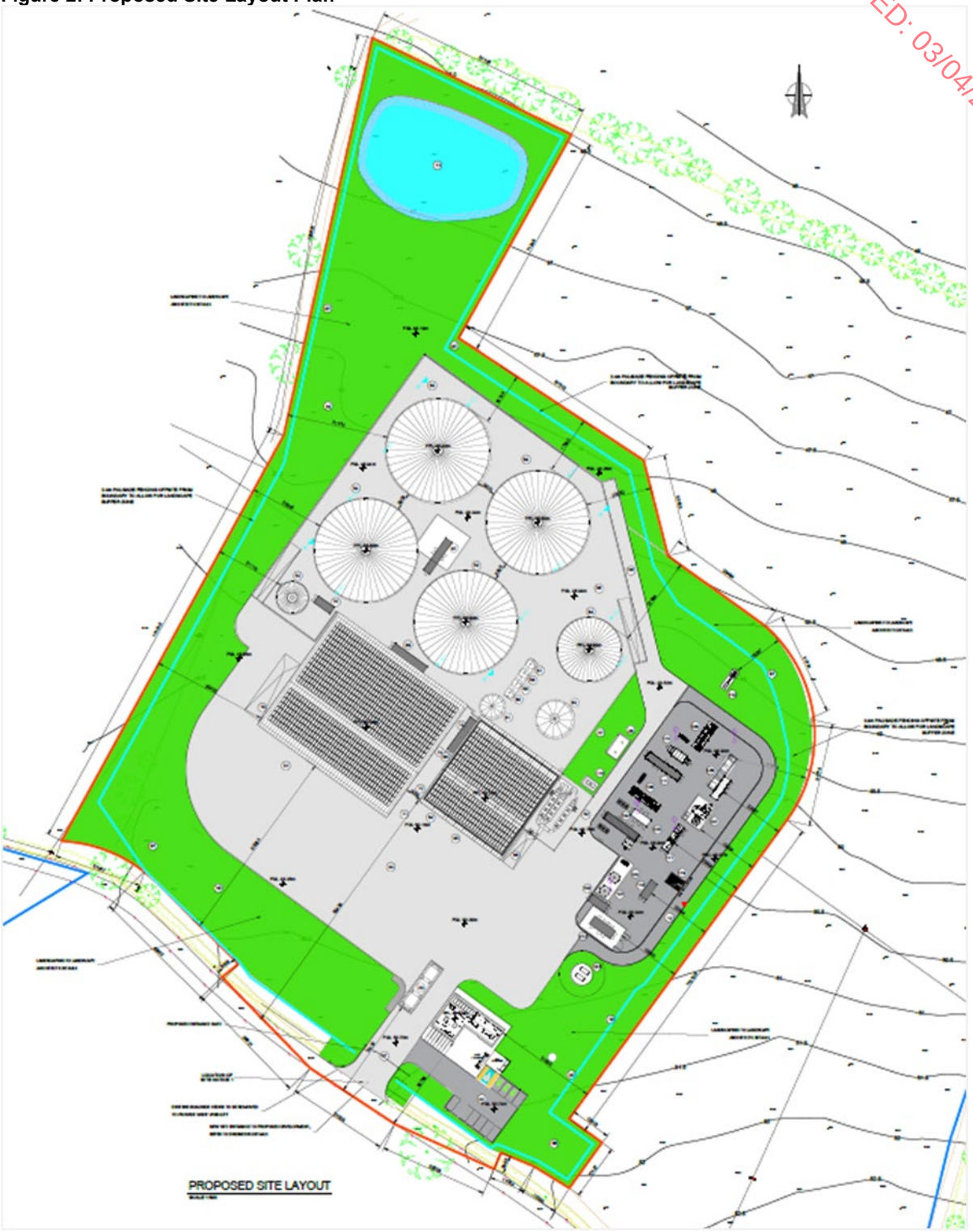
The total site area measures ca. 4.02ha. The site is currently used as agricultural pastureland and bounded to the north, south, east, and west by further agricultural pastureland. An operational farm is located ca. 200m to the southeast.

The site is bordered to the south by Ballyduff South Road (L6187) which intersects with the Knockenrahen Road (L2190), 57m southeast of the site. The Proposed Development will be accessed via Ballyduff South Road (L6187) and a new junction access.

1.4 Site Layout

The site layout is displayed in **Figure 2.** Detailed site layout and structural drawings are included in **Volume IV: Drawings**.

Figure 2: Proposed Site Layout Plan



1.5 3D Image of the Site Layout

A 3D model image of the site layout is included in **Figure 3**.

Figure 3: 3D Image of Site Layout

2 Process and Design Description

2.1 Anaerobic Digestion Process

Anaerobic Digestion (AD) is a natural biological decomposition process which takes place in an oxygen-free environment, where micro-organisms break down organic matter to produce biogas.

2.2 Biogas

Biogas is the product of this complex biological decomposition of organic materials, mainly consisting of 55-70% by volume methane (CH_4), 30-45% carbon dioxide (CO_2).

2.3 Feedstock

The Proposed Development has been designed to accept and treat up to 90,000 tonnes per year of predominantly locally sourced agricultural manures, slurries, food processing residues and crop-based feedstocks.

2.4 Odour Treatment System

An Odour Treatment System will recover and treat all odours arising from potentially odorous activities occurring on site. All major odour sources, inclusive of the Reception Hall, Digestate Storage Tanks, Liquid Feed Tanks, Pasteurisation Tasks are all connected to the Odour Treatment System.

2.5 Primary and Secondary Digestion Tanks

The Anaerobic Digestion process takes place in a series of 2no. Primary and 1no. Secondary Anaerobic Digestion Tanks. The Digestion Tanks are equipped with mechanical mixers featuring a series of paddles with externally mounted drive units and are equipped with a double membrane gas collection system.

2.6 Digestate Treatment

The Digestate Treatment System has a design capacity to treat a minimum of 78,000 tonnes of whole digestate per annum. Following treatment of the whole digestate, ca. 8,000 tonnes of digestate fibre, and ca. 17,000 tonnes of liquid digestate concentrate will be produced. The treatment process will recover ca. 53,000 tonnes of clean water which will be reused on site for cleaning, with the remaining volume returned to the process as a feeding liquid.

2.7 Biogas Upgrading

The primary goal is to separate carbon dioxide (CO_2) from methane (CH_4) to produce renewable biomethane and CO_2. Biogas upgrading removes trace impurities in the biogas stream. The proposed Biogas Upgrading Unit will recover over 99.9% of the biomethane present.

2.8 Grid Injection Unit (GIU)

Biomethane will be supplied to the existing gas network via the on-site Grid Injection Unit (GIU) and a pipeline connecting the site to the existing medium pressure distribution gas pipeline located ca. 835m southeast at Ballynattin, Co. Wicklow.The GIU and pipeline will be owned and operated by Gas Networks Ireland. The GIU comprises equipment which will ensure that the biomethane is compliant with all necessary standards and regulations before it enters the local gas network.

2.9 CO2 Liquefaction

By extending the Biogas Upgrading Unit with a CO_2 Liquefaction system, the gaseous CO_2 is processed into liquid CO2 in a liquefaction system.

2.10 Licensing Requirements

Environmental Protection Agency (EPA)

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

Department of Agriculture, Food and Marine (DAFM)

The application process for approval and operation of the Proposed Development by the DAFM will commence upon receipt of planning consent.

SEVESO/COMAH Assessment of the Proposed Development

Methane, the combustible component of biogas is classified as a P2 flammable gas in accordance with Regulation (EC) No. 1272/2008 on the classification, labelling and packaging of substances and mixtures.

Biogas, is classified as a P2 flammable gas in accordance with Regulation (EC) No. 1272/2008 on the classification, labelling and packaging of substances and mixtures.

Under COMAH regulations, P2 Flammable gases are subject to a threshold quantity of 10 tonnes meaning that any biogas facility storing less than 10 tonnes of methane will fall outside of the COMAH Regulations. At full operation, the proposed facility will store less than 7.205 tonnes of flammable gas, and is, therefore, not a COMAH regulated site.

3 Consideration of Alternatives

A detailed site selection process was undertaken by the Applicant, with reference to the following criteria:

- Transport Network and Access
- Availability and proximity to Feedstock Supply
- Availability and proximity to Digestate Receivers
- Existing Land Use
- Landscape Sensitivity
- Ecological Designations
- Archaeological Designations
- Access to Gas Grid
- Access to Electricity Grid
- Proximity to Sensitive Receptors
- Available Land Size
- Land Availability
- Landscape and Visual Amenity
- Proximity to Suitable Water Course or Sewer
- Proximity to Drinking Water Source/Aquifer
- Topography
- Flood Risk

The applicant devised a scoring matrix based on each of the site-specific criteria outlined above. 4 no. alternative site locations within County Wicklow were assessed under the above criteria, with the site at Moneylane, Arklow, Co. Wicklow scoring highest overall.

4 Planning and Policy

4.1 Application Site: Planning History

The following planning history is based on a review of the Proposed Development site and surrounding area using the Planning Authority online planning search tool.

There is no planning history on the subject site.

Adjacent Sites:

We note the following planning history for adjacent sites relevant for the subject proposal.

Reg. Ref.: 23/50 – Immediately South of Subject Site

Wicklow County Council (WCC hereafter) granted permission on the 28th April 2023, subject to 7 no. conditions, to erect a circular slurry storage tank, immediately south of the subject site.

The conditions related to foul effluent discharge; uncontaminated water discharge; land spreading; and construction of the over-ground circular storage tank.

Reg. Ref.: 20/731 – Machinery Shed and Portacabin Building for Office Use – Southeast of Subject Site

WCC granted permission on the 11th June 2021, subject to 5 no. conditions, for the following development:

"(i) machinery shed (492sqm) (ii) lean to extension (283sqm.) to existing building permitted under PRR 98/9110 and (iii) portacabin building for use as site office, all structures in connection with the applicants agricultural contracting business".

Reg. Ref.: 19/1018 – Demolition and Erect Extensions to Dwelling and Associated Development – West of Subject Site

WCC granted permission on the 17th January 2020, subject to 8 no. conditions, to *"demolish conservatory and porch to front of existing dwelling and two storey flat roof section to rear elevation and permission to make alterations and erect extensions to dwelling, erect a new vehicular entrance and upgrade existing sewage facilities to current EPA standards and all associated site and ancillary works".*

Reg. Ref.: 18/1100 – Southeast of Subject Site – Retention Permission

WCC granted retention permission on the 11th January 2019, subject to 2 no. conditions, for the construction of a garage and car port and all ancillary site works.

Reg. Ref.: 18/552 – Southeast of Subject Site - Finger Post Sign

WCC refused permission (licence under section 254) on the 9th July 2018, for the erection of a finger post sign for Wicklow Calf Company.

The proposed signage was refused for the following reason:

Having regard to the existing fingerpost signage at this location which includes directional information, the provision of the Development Plan, which provides that such signage will only be considered where it supplements rather than duplicates information, and such signage should not replace the preplanning of the journey. The need for the signage has not been justified, would result in visual clutter and conflict with road safety.

Reg. Ref.: 16/1377 – Immediately South of Subject Site

WCC granted permission on the 21st March 2017, subject to 7 no. conditions, for a cattle shed and effluent storage facilities, concrete apron and associated site works.

The conditions of the grant related to the colour of roofing and cladding; discharge of effluent and uncontaminated water; arrangements for all liquid and solid animal wastes; and land spreading.

Reg. Ref.: 15/763 – Southeast of Subject Site

WCC granted permission on the 12th October 2015, subject to 14 no. conditions, for the construction of a bungalow with a garage, a new vehicular entrance, a well, effluent treatment system to current EPA standards and all ancillary works.

Reg. Ref.: 14/2177 – New Dwelling – West of Subject Site

WCC granted permission on the 6th July 2015, subject to 14 no. conditions, for a *"proposed new dwelling, garage, effluent disposal system to current EPA standards, bored well, new entrance, together with all ancillary site works".*

Reg. Ref.: 12/6117 – West of Subject Site on Ballyduff South Road

WCC granted permission on the 27th November 2012, subject to 14 no. conditions, for a *"detached dormer bungalow and single storey domestic garage together with an on-site waste water treatment facility and associated site works".*

FI was requested on the 13th of September 2012 and the 5th April 2012.

Reg. Ref.: 09/884 – West of Subject Site on Ballyduff South Road

On the same site, WCC refused permission for the same development as Reg. Ref.: 12/6117 above, on the 17th December 2009. The refusal states that the proposed development would be prejudicial to public health because the site inspection indicated that the site is unsuitable for an onsite effluent disposal system discharging groundwater.

Reg. Ref.: 08/221 – Detached Bungalow with Envirocare Treatment Plant and Percolation Area – West of Subject Site

WCC refused permission on the 30th July 2008, for a *"detached bungalow with detached garage, with envirocare treatment plant and built up percolation area, using existing bored well and proposed opening of existing disused entrance".*

Reg. Ref.: 05/2443 – South of Subject Site

WCC granted permission on the 26th April 2005, subject to 20 no. conditions, for a *"dwelling &*

garage with services".

Reg. Ref.: 05/2343 – New Water Treatment Plant – Northwest of Subject Site

WCC granted permission on the 9th May 2006, for a *"new water treatment plant along with all associated work to facilitate the upgrading and expansion of existing water treatment plant at Ballyduff".*

Reg. Ref.: 99/743 – East of Subject Site

WCC granted permission on the 15th December 1999, subject to 10 no. conditions, for the demolition of the existing dwelling and the erection of a dormer bungalow.

Reg. Ref.: 98/9110 – Machinery Shed – Southeast of Subject Site

WCC granted permission on the 7th of January 1999, subject to 4 no. conditions, for the construction of a machinery shed.

Reg. Ref.: 96/4735 – Southeast of Subject Site

WCC granted permission on the 11th November 1996, subject to 3 no. conditions, for an extension to the existing dwelling.

Reg. Ref.: 92/8179 – East of Subject Site

WCC granted permission on the 17th August 1992, for an extension to the existing house.

Reg. Ref.: 91/6655 – Southeast of Subject Site

WCC granted permission on the 25th April 1991, for an extension to the existing house, provision of a new entrance and installation of a septic tank.

Reg. Ref.: 91/7233 – Northwest of Subject Site - Extension to Dwelling

WCC granted permission on the 10th September 1991, subject to 2 no. conditions, for the extension to the existing dwelling.

Reg. Ref.: 90/6125 – South of Subject Site

WCC granted permission on the 21st January 1991, subject to 2 no. conditions, for an extension to the existing house and the provision of a front porch, vehicular access, garage and front boundary walls.

Reg. Ref.: 90/6087 – East of Subject Site – Extension and Additional Slurry Storage

WCC granted permission on the 7th December 1990, for the extension to the cubicle house and provision of additional slurry storage.

Biogas Facility Related Planning Permission

Reg. Ref.: 09/720 – AD Unit in Grangecon – West of County Wicklow

WCC granted permission on the 28th April 2010, subject to 16 no. conditions, for the following development at Rathcon Farm, Grangecon, Co. Wicklow:

"Anaerobic digestion unit for the purpose of generating renewable energy in the form of electricity and heat. The unit will require a reception shed, a site office, a digester, 2 no digestate storage tanks, 2 no reception tanks, 1 no pasteurisation tank and a combined heat and power engine without put no greater than 360kv electricity. The development will require a waste licence for operation."

4.2 European Policy and Legislation

4.2.1 The Paris Agreement

Under the Paris Agreement (COP21), the EU has pledged to achieve climate neutrality by 2050. Reaching this objective will require a transformation of Europe's energy supply, society, and economy. The Proposed Development represents renewable energy development which will contribute to achieving this goal.

4.2.2 European Green Deal

The European Green Deal recognises that renewable and low-carbon gases, such as biomethane, will play a central role in achieving climate neutrality. The Green Deal notes that biogas and biomethane, in addition to green hydrogen, have the potential to displace fossil fuel gas.

4.2.3 EU Common Rules on Renewable Gasses

The Common Rules on Renewable Gasses seek to ensure that EU Member States take all necessary steps to assist in the wider use of sustainable biomethane, and to ensure that biomethane can be injected into and transported via the natural gas system.

4.2.4 Renewable Energy Directive

The current directive (2018/2001/EU, amended by Directive EU 2023/2413), or RED III sets a binding renewable energy target of at least 42.5% by 2030. It includes measures to facilitate renewable energy projects and strengthen bioenergy sustainability criteria.

4.2.5 REPowerEU Energy Plan

Introduced by the European Commission on the 18th May 2022, the Plan aims to accelerate the EU's clean energy transition and reduce dependency on Russian fossil fuels. It includes a Biomethane Action Plan to achieve 35 billion cubic meters of biomethane production by 2030 and recommends measures to facilitate renewable gas injection.

4.2.6 EU Strategy to Reduce Methane Emissions

Published in 2020, this strategy identifies the agricultural sector as a major contributor to methane emissions. It highlights the benefits of biogas from organic agricultural wastes, supports the development of the EU biogas market, and promotes sustainable farming practices.

4.2.7 Waste Management Legislation

The Waste Framework Directive (2008/98/EC, amended by Directive (EU) 2018/851) and the Landfill Directive (1999/31/EC) encourage the use of anaerobic digestion (AD) as a sustainable waste management method. The directives emphasise the diversion of waste from landfills and the separate collection of organic waste for biological treatment

4.3 National Planning, Climate, and Waste Policy and Legislation

Chapter 4 provides an overview and analysis of the following relevant pieces of national policy and legislation, as summarised below.

- **National Biomethane Strategy:** The National Biomethane Strategy was finalised and published in May 2024. The Strategy seeks to promote delivery of a biomethane industry at scale in Ireland and sets out the significant benefits (both environmental and economic) that developments of this nature can realise. The Strategy also acknowledges the importance of biomethane production to ensure security of energy supply. It notes that without the development of biomethane production, Ireland is unlikely to meet its legally binding climate targets.
- **National Planning Framework:** The NPF supports low-carbon and energy-efficient initiatives in rural areas, aiming to strengthen rural towns through sustainable development and renewable energy projects.
- **The National Development Plan 2021-2030:** The National Development Plan provides further policy support for the transition to a climate neutral and climate resilient society, and the strengthening of the rural economy and communities. The proposed development delivers strongly on these objectives.
- **Climate Action Plan 2024:** The 2024 Climate Action Plan is the third annual Climate Action Plan, and provides direct policy support for biomethane development, noting a target of 5.7 terawatt hours of biomethane by 2030, with one terawatt hour to be delivered by 2025. The proposals will contribute to meeting this ambitious target.
- **Climate Action Plan 2023:** Similarly to the current 2024 Climate Action Plan, the 2023 Climate Action Plan also strongly supported biomethane development in the State.
- **Climate Action and Low Carbon Development Act:** Section 15 of this piece of climate legislation requires that Planning Authorities and An Bord Pleanála carry out their functions, in as far as is practicable, with key climate action policies, including the relevant Climate Action Plan. Chapter 4 outlines the compliance of the development with those relevant policies.
- **Sectoral Emissions Ceilings:** The Sectoral Emissions Ceilings represent binding limits on the greenhouse gas emissions for various sectors of the economy, including agriculture and energy. The proposed renewable energy development will assist in reducing greenhouse gas emissions in these sectors.
- **Support Scheme for Renewable Heat:** This Support Scheme seeks to advance the generation of energy from renewable sources in the heat sector, including biomass boilers and anaerobic digestion heating systems.
- **White Paper: Ireland's Transition to a Low Carbon Energy Future 2015–2030:** The White Paper sets out a framework for policy actions of the Government from 2015-2020, it includes support for the further development of bioenergy. It recognises that anaerobic digestion projects can improve air quality and reduce odour emissions in rural areas, by diverting slurry from being spread on the land.
- **Biomethane Energy Report (Gas Networks Ireland):** While not strictly a policy document, this report published by GNI details the significant potential for biomethane development in the State, noting the ability of such development to improve security of supply, boost rural employment, and rapidly reduce climate emissions across hard to abate

sectors of the economy.

- **Energy Security in Ireland to 2030:** This policy was published by Government following the invasion of Ukraine by Russia and the resulting energy crisis. The new National Biomethane Strategy is recognised as an important move towards improved energy security within this policy document.
- **National Policy Framework on Alternative Fuels Infrastructure for Transport in Ireland:** The Policy Framework highlights the importance of alternative fuels in decarbonising the transport sector, including via the incorporation of biomethane as a transport fuel.
- **Ag Climatise – National Climate & Air Roadmap for the Agriculture Sector:** This Roadmap includes an action for the promotion of anaerobic digestion for the agriculture sector.
- **National Energy and Climate Plan (NECP) 2021-2030:** This Plan included further policy support for biomethane development and included a target for 1.6 terawatt hours of biomethane production, which has since been revised upward under the 2023 and 2024 Climate Action Plans.
- **The Planning and Development Act 2000 (as amended):** The Planning and Development Act includes legislative recognition of the need to respond to climate change and to promote renewable energy development. It also provides the overall legislative framework for the Irish Planning System and Environmental Impact Assessment.
- **Whole of Government Circular Economy Strategy 2022 – 2023:** This Strategy directly targets the increased recycling of bio-waste and further renewable gas development, to enhance the circularity and sustainability of agriculture in the state.
- **A Waste Action Plan for a Circular Economy Strategy 2020-2025:** This Waste Action Plan recognises that anaerobic digestion plays a role in providing opportunities for regional development with benefits for local communities while producing renewable energy domestically.
- **National Policy Statement on the Bioeconomy (2018):** This Policy Statement notes that Ireland has a strong competitive advantage for the development of a more coherent and stronger bioeconomy.
- **Common Agricultural Policy (CAP) Strategic Plan 2023 – 2027:** The Common Agricultural Policy Strategic Plan provides support for farmers and contributes to improved sustainability in agriculture and agricultural practices.
- **European Union (Waste Directive) Regulations 2020:** This legislation regulates how waste compost and digestate are recycled into fertiliser products.
- **Environmental Protection Agency (Industrial Emissions) (Licensing) Regulations, 2013:** These Regulations introduce a class of licence known as an Industrial Emissions Licence. The proposed development will require an Industrial Emissions Licence from the EPA to operate.
- **Animal By-Product Regulations:** These Regulations set out requirements which must be met in order to build and operate a biomethane development, including in relation to design, feedstock, and equipment requirements.

4.4 Regional Planning Policy

The Regional Spatial and Economic Strategy for the Northern and Western Region (RSES) supports renewable energy projects and highlights the importance of regional bio-economy initiatives. It encourages the sustainable management of organic waste and the development of anaerobic digestion facilities to generate renewable energy.

4.5 Local Planning Policy

4.5.1 Wicklow County Development Plan 2022-2028

The Wicklow County Development Plan[1] 2022-2028 recognises the central role of land use planning in promoting a low carbon society, mitigating the impact of climate change, and progressing towards a sustainable energy future for County Wicklow. The CDP aligns with the NPF, by recognising the role that rural areas play in driving the economy, for example by attracting entrepreneurship and innovation development, particularly where low carbon outputs can be achieved.

The relevant policies and objectives of the County Development Plan include the following:

- The Proposed Development site is not located within a landscape category.
- According to the Wicklow Landscape category map of the CDP, The Proposed Development site is located between landscape defined as 'Rolling Lowlands' (to the west) and 'Urban Areas' (to the east).
- The CDP promotes sustainable rural development, including bio-energy projects.

4.5.2 Wicklow Local Economic and Community Plan (LECP)

The Wicklow Local Economic & Community Plan (LECP), outlined in Section 9.1.2 of the CDP, includes objectives and actions promoting and supporting economic development and the local and community development of the County. We take note of the following goals and objectives of this plan:

- **Goal 9:** Support a shift towards low carbon and climate change resilient economic activity, reducing energy dependence, promoting the sustainable use of resources and leading in the Smart Green Economy.
- **Goal 10:** Harness efficiently the full resources of the County and promote interagency collaboration.
- **Goal 8:** Capitalise on Wicklow's unique attributes and proximity to the Dublin market, excellent quality of life, human capital, tourism, landscape, marine, agricultural and forestry resources.

- **Objective 8.4:** Support the rural economy and promote rural economic diversification.
- **Objective 9.1:** Support the development of renewable energy and a low energy future for Wicklow.
- **Objective 6.1:** Support inward investment and promote the creation and expansion of new and existing employment opportunities in the County to drive economic development within the County.
- **Objective 6.3:** Support the provision of high-quality infrastructure throughout the County

[1] *CDP*: Adopted Plan (wicklow.ie)

that will facilitate and support economic expansion.

- **Objective 7.2:** Harness the County's existing assets and encourage collaborative opportunities and business engagement amongst sectors to develop new markets and initiatives, maximising opportunities for business development and employment creation.

5 Biodiversity

The Ecological Impact Assessment addresses the potential ecological impacts that may occur in the future on the terrestrial and aquatic ecology of the Proposed Development.

5.1 Methodology

The assessment followed CIEEM, EPA, and NRA guidelines, evaluating ecological features and potential impacts, which were classified as positive, negative, or neutral, with mitigation measures proposed.

5.2 Designated Sites

Natura 2000 Sites

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

Nationally Important Sites

The Proposed Development is not within or immediately adjacent to any nationally designated site, such as a Natural Heritage Area or a proposed Natural Heritage Area. It is within the Zone of Influence of nine sites that have been designated as proposed Natural Heritage Areas.

Habitats within the Study Area

- The site does not lie within or adjacent to any designated nature conservation areas and is considered to have low local biodiversity value.
- The main habitat is improved agricultural grassland, dominated by rye and meadow grasses, with no wetland indicators present.
- Perimeter features include hedgerows and stone walls, with species such as blackthorn and bramble, with climbing ivy observed in the canopy. Mature ash and beech are interspersed.

Overall, the biodiversity and ecology of this Proposed Development site is of low value.

Fauna

Protected Mammals

- Records indicate the presence of various protected mammals in the wider 10km area, including several bat species, Eurasian badger, otter, Irish hare, and more.
- No evidence of these species was found within the proposed development site itself.

Bats

- The landscape suitability index for bats in the study area is moderately high (47.33).

- There are no buildings within the site, however there are mature trees present along the site boundaries that may offer bat roost potential in the future. These tress are to be retained as part of the landscaping measures.

Birds

- Limited bird activity was noted, with common species such as Blackbird, Great tit, Wren, Robin, Starling, and Jackdaw observed.
- Having regards to the network of treelines and hedgerows that surround the site, the site and its surrounding habitats are likely to be of medium-high local importance for birds.

Amphibians, Reptiles, and Invertebrates

- No suitable breeding habitats for common frog or smooth newt are within the site.
- The improved agricultural grassland habitats within the site provide limited value to pollinating insects, however any unmanaged verges along the site perimeters and the hedgerows would provide suitable foraging habitats for pollinating insects in the late spring and summer.

Aquatic Environment

Water Features and Quality

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

5.3 Ecological Evaluation

5.3.1 Summary of the Value of the Site

The location of the Proposed Development is within a 15km Zone if Influence of sites designated under European Law. The closest of these are located 6.2km southeast of the site. As such and in accordance with Article 6(3) of the EU Habitat's Directive (Council Directive 92/43/EEC) regarding Appropriate Assessment, the screening exercise for Appropriate Assessment was carried out to identify whether any significant impacts on designated sites are likely. The exercise was used to determine the appropriateness of the proposed project, in the context of the conservation status of the designated sites.

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

The Proposed Development will not result in the loss or fragmentation of protected habitats within any proposed Natural Heritage Area (pNHA) or designated Natural Heritage Area (NHA).

However, one pNHA—Arklow Town Marsh (001931)—is located along the Ballyduff Stream and extends to the point just before it meets the Avoca River.

The Avoca River itself is not designated as a Natura 2000 site and is classified as "Not at Risk" under the Water Framework Directive.

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

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

Plans indicate that the remaining vegetation along the boundaries will be retained and enhanced through a Landscape Plan.

5.4 Impact Assessment

5.4.1 Impacts upon Designated Sites

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

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

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

5.4.2 Impacts within the Site

Construction Phase

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

Disturbance to Wildlife: Construction noise and activity may disturb local wildlife, including mammals and birds.

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

Operational Phase

Disturbance to Local Wildlife: Increased activity, noise, and lighting could disturb local wildlife. Mitigation will ensure minimal disruption, particularly for bats.

Pollution to Surface and Groundwater: Operational runoff may contain pollutants. Structural weaknesses in tanks could lead to groundwater contamination.

Flood Risk: The site is at low flood risk, but flood events could overwhelm drainage systems, leading to potential off-site contamination.

Cumulative Impacts: Other local developments could reduce habitat availability. However, the creation of new areas of biodiversity within the Proposed Development and the retention and protection of treelines, will provide local ecological corridors and networks that will reduce the overall cumulative impact of this development in the Moneylane area.

5.5 Mitigation Measures

In order to avoid any reductions in water quality in the area surrounding the Proposed Development in Moneylane, a number of mitigation measures must be implemented and followed. 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. These mitigation measures, outlined in **Table NTS 5.1** below, are also included in the accompanying AA Screening report.

Table NTS 5.1: Mitigation Measures

Table 5.3: Mitigation Measures	
Stage	**Details**
Pre-Construction and General Requirements	Site preparation and construction must be confined to the Proposed Development only and all mitigation measures must be adhered to.
	Contractors must be made aware of the ecological sensitivity and mitigation measures. This will be done prior to the commencement of any site works
Protection of Terrestrial Habitats and Features	Existing green infrastructure must be incorporated into the development. There must be no dumping or storage of construction waste or machinery in this zone during construction
	Use of native trees and shrubs specified in landscaping maps provided in accordance with relevant standards.
	Removal of trees/shrubs should be outside the bird nesting season.
	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
Protection of Water Quality and Management of Pollutants	Adherence to guidelines to protect water quality in the Ballyduff Stream.
	Efficient construction practices to minimise soil erosion and pollution.
	Avoid works during heavy rainfall.
	Control of hydrocarbons on site with specific measures. All chemicals must be stored as per manufacturer's instructions.
	Best practice concrete / aggregate management measures must also be employed on site during construction.

	Management of construction waste and soil by registered contractors.
	All guidelines within the document IFI Requirements should be adhered to during the construction of the headwall. The works should be carried out under the supervision of the ECoW
Management of Construction Waste and Soil	All construction waste must be removed from site by a registered contractor to a registered site
	All topsoil generated from site works should only be stored within the Proposed Development until it is required for landscaping
Mitigation Measures during Operation	An Environmental Management System (EMS) accredited to ISO14001:2015 will be prepared and implemented by the operating company during the operational phase.
	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 Anaerobic Digestion Facility's lifespan
Landscaping and Lighting	The stonewalls and hedgerows around the site should be enhanced and maintained for the benefit of wildlife.
	The existing gappy hedges should be enhanced with some more native shrubs if possible, such as hawthorn, gorse, and blackthorn
	The natural verges along the stonewall hedgerows should be managed as old hay meadows, cutting only in late summer.
	It is recommended that further actions that are outlined as part of the National Pollinator Plan should be implemented
	Nesting areas for solitary bees could be included and bee boxes for cavity-nesting bees could be created.
	Bat boxes could be installed around the Proposed Development
	The use of herbicides and rodenticides within the Proposed Development should be minimised and should be in accordance with relevant guidelines.
	Lighting should be kept to a minimum around the remaining trees on the Proposed Development and align with Guidelines.
	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.
Use of the Biobased Fertilisers by Customer Farmers	In order to avoid any reductions in water quality within the catchment as a whole, all biobased fertilisers must be used in accordance with S.I. 113 of 2022 European Communities
	The spreading of the biobased fertiliser on the customer farms must be done in accordance with the specific Nutrient Management Plan for that farm.

5.6 Residual Impacts

Construction Phase

A summary of the predicted effects associated with the construction phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual effects are summarised in **Table 5.7** in Chapter 5 of the EIAR – Main Report.

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

Operational Phase

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

The overall impact anticipated by 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.***

6 Population and Human Health

Chapter 6 of Volume 2 of the EIAR assesses the likely significant effects of the proposed development on Population and Human Health, with reference to population, human heath, employment, and community. The assessment methodology involves a thorough desktop study and fieldwork, utilizing guidelines from the EPA, European Commission, and the Institute of Environmental Management and Assessment (IEMA). The primary goal is to ensure that the development's effects on human health and welfare are comprehensively evaluated and mitigated.

6.1 Receiving Environment

Population & Employment

The health status of the population in the study area, as reported by the Central Statistics Office (CSO) in the 2022 Census, shows that 78.45% of the local area self-reports their health as 'good' or 'very good', consistent with county and national trends, and indeed the nearest town, Arklow.

The study area has experienced population growth between the 2016 and 2022 censuses, with a growth rate that is slightly less than the rates seen at county and State levels (3.51% growth increase locally vs. 8.13% increase nationally).

According to the Pobal HP Deprivation Index, the ED within which the Proposed Development is situated is marginally below average, indicating moderate population sensitivity.

There is a lower than average age dependency ratio, therefore a large proportion of the population is within working age range in the ED, thus considered as largely independent and judged to be not sensitive to change. The data shows that the study area has a consistent percentage of persons with a disability as that of the county and national average indicating that for persons within the area, there is not an increase of restrictions on daily activities.

Overall, the population within the study area is not particularly sensitive to change, with an overall ranking of ***low sensitivity***.

Community

The two principal aspects of the community surrounding the subject site can be defined as follows:

- The site of the Proposed Development is located on the west side of the M11 motorway (c. 750m west). The closest established residential area is at Arklow town (c. 700m southwest). One off residential units are also sparsely located, within a closer proximity, with the closest being located immediately southeast of the site (c. 73m) and immediately southwest (c. 60m).
- The working community in the vicinity of the Proposed Development site comprise primarily agricultural-based employment. Other employment within the wider vicinity includes a window installation service (c. 319m southeast), a water treatment plant (c. 565m north), a rubber products supplier (c. 665m north), a technology tests laboratory (c. 790m southeast), and multiple employment types east of the M11 at Arklow town.

Human Health (Off-Site)

There is a low age dependency ratio, therefore a large proportion of the population is within working age, thus considered as largely independent and judged to be not sensitive to change. The information presented above for the study area shows, a high proportion describes their health status as 'very good'. The data shows that the study area has a lower percentage of persons with a disability than the national average: indicating that for persons within the area, there are relatively few restrictions on daily activities. The population within the study area is therefore not particularly sensitive to change, with an overall ranking of low to moderate sensitivity.

Human Health (On-Site)

An anaerobic digestion plant is considered to be a biological treatment facility, the operation of which can have the potential for a variety of exposure scenarios involving a range of factors including:

- Pest Control
- Engineering specification
- Abatement technologies
- Hydrogeology
- Topography
- Type and quantity of waste accepted.
- Biogas generation

In the absence of appropriate mitigation, the primary hazards to human health at a biogas facility is mainly associated with uncontrolled discharges to air and water.

6.2 Likely Significant Effects

Do-Nothing Scenario

Under the 'Do Nothing' scenario, the current land use of the Proposed Development site would remain unchanged, with no additional effects on the following receptors:

Local Population & Employment: The local population and employment levels would remain unaffected, but the opportunity to create additional jobs and contribute to specific objectives in the County Development Plan and the 2024 Climate Action Plan would be lost.

Community: Community perceptions would remain unchanged, but the potential economic and social benefits from the development would be foregone.

Land Use: The land would likely continue to be used for agriculture.

Human Health (Off-Site Receptors): There would be no effects on human health, as the site would remain in its existing greenfield state. However, the opportunity to provide renewable energy to the national grid and address rising energy costs would be missed.

Human Health (On-Site Receptors): It is likely that the risks associated with uncontrolled pests and vermin on the surrounding the area, livestock and ecological receptors will be significantly reduced (in the absence of mitigation).

Overall, the 'Do Nothing' scenario is sub-optimal in the context of national and county renewable energy targets and efforts to mitigate climate change. in the context of the national and county targets for the adoption of renewable energy sources, and in the context of anthropogenic climate change. Furthermore, an opportunity to introduce a bio-based fertiliser, with reduced pathogen content into to local bioeconomy will be missed.

Receptor Sensitivity

Sensitivity of the receptors identified are summarised in **Table 6.11** (extracted from Chapter 6)

Table 6.11 – Receptor Sensitivity

Receptor	Receptor Importance	Receptor Sensitivity	Rationale
Local Population & Employment	Low to moderate	High	The Proposed Development provides employment opportunities to the local area and surrounds, also with the potential to provide renewable energy.
Community	Low to moderate	Low	The overall economic and social benefits that the development would bring to the area would not be experienced by the community in the event of the development not occurring.
Human Health (Off-Site)	Low to moderate	Low	If the Proposed Development were not to proceed this greenfield site would remain in its existing form and the unique opportunity of providing renewable energy will be missed.
Human Health (On-Site)	High	High	The development will result in a situation where human health will be put at risk due to typical hazards associated with the construction and operation of the proposed facility.

Sources

Construction Phase

Population

The construction phase is not considered to have any significant effect on the population of the surrounding area, as it is expected that the work force will primarily travel from their existing place of residence to the construction site. As such activities associated with the construction phase are anticipated to have **positive, slight, temporary** effects on the local population.

Employment

The Proposed Development will provide important construction and related employment. The construction phase will also have secondary and indirect 'spin-off' effects on ancillary support services in the area of the site, such as retail services, together with wider benefits in the aggregate extraction (quarry) sector, building supply services, professional and technical professions etc. As such, activities associated with the construction phase are anticipated to have **positive, slight, temporary** effects on employment within the area.

Community

It is acknowledged that the construction phase of the project may have some short-term negative effects on local residents. These effects are dealt with separately and assessed in other technical chapters of the EIAR. It is expected that these short term temporary localised effects may be experienced by those residing, working, and visiting the area. Such effects would include an increase in daytime noise levels in the area as a result of the machinery being used for construction purposes. Activities associated with the construction phase are anticipated to have **negative, slight, temporary** effects on the local community.

Installation of Gas Pipeline

This Chapter of the EIAR addresses the installation of a gas pipeline to serve the development, which will be designed and delivered by GNI. The impact of the construction phase of the gas pipeline is considered to be ***negative, slight, and temporary*** on local population and human health.

Human Health

The Health and Safety policy, procedures and work practices of the Proposed Development will conform to all relevant health and safety legislation both during the construction and operational stages of the Proposed Development. The Proposed Development will be designed and constructed to best industry standards, with an emphasis being placed on the health and safety of employees, visitors, local residents and the community at large. Activities associated with the construction phase are anticipated to have **negative, slight, temporary** effects.

Operational Phase

Potential operational phase effects are considered in detail below and summarised in **Table 6.12** in Chapter 6 of the EIAR – Main Report.

Table 6.12 – Construction Phase Effects Summary

Receptor	Sensitivity Rating	Potential Environmental Effects	Quality	Significance	Duration
Local Population	Low to moderate	Potential minor increase in population during construction.	**Positive**	**Imperceptible**	**Temporary**
Employment	Low to moderate	Will provide jobs during the construction phase. May attract other sources of employment to the area.	**Positive**	**Slight**	**Temporary**
Community	Low to moderate	Wear and tear on the infrastructure. Construction traffic. Risk to air/noise.	**Negative**	**Slight**	**Temporary**
Installation of Gas Pipeline	Low to moderate	materials can pose a risk to Human Health due to the presence of Polycyclic Aromatic Hydrocarbons (PAHs).	**Negative**	**Slight**	**Temporary**

Human Health (Off-Site)	Low to moderate	Risk to health from construction methods. Impact of disturbance, air and noise impacts during construction.	**Negative**	**Slight**	**Temporary**

6.3 Mitigation Measures

Construction Phase

Potential effects during the construction phase will be minimised through the implementation of the Construction Environmental Management Plan which will be submitted to the council prior to construction.

Population

It is considered that the Proposed Development is unlikely to generate any significant adverse effects on the demographics of the area No mitigation measures are required during the construction phase.

Employment

The Proposed Development will have a positive effect on employment levels in the area and as such no mitigation measure are required.

Community

It is considered that the Proposed Development is unlikely to generate any adverse effect on the community of the area either during the construction phase or the operational phase and would actually have positive economic effects. No mitigation measures are required during the operational phase.

Installation of Gas Pipeline

Trenches will be backfilled shortly after installation of each section. Any waste material will be appropriately segregated and disposed of. The pipeline will be designed and implemented by GNI in accordance with *I.S. 328 2021 Gas transmission — Pipelines and pipeline installations.*

Human Health

Adverse health and safety effects during the construction phase will be minimised through the implementation of the Construction Management Plan to be prepared by the main contractor.

Operational Phase

Potential effects to the local population, employment and community are neutral to positive hence no mitigation measures are recommended for these receptors. A robust set of measures are proposed for the following operational aspects relating to Human Health, outlined in detail

in section 6.7 of the main EIAR Report and within Chapter 16 - Schedule of Mitigation. Mitigation measures are provided where relevant for the following:

- Pest Control
- Fugitive Emissions
- Hazardous Substance
- Biological Agents
- Electrical Hazards
- Gas Hazards
- Explosion and Fire Hazards
- Malpractice.

6.4 Cumulative Effects

The cumulative effects of the proposed construction and operation of a biogas facility near Arklow with other developments in the area are reviewed in this section with specific regard to the local population.

Construction Phase

The mitigation measures outlined in the CEMP and in Chapter 6 of the EIAR – Main Report, should be applied throughout the construction phase of the Proposed Development. This will ensure any significant cumulative effects on the local population and the greater environment are prevented.

Operational Phase

The cumulative effects on the local population and human health during the operational phase of the Proposed Development are expected to be minor. These effects primarily stem from a slight increase in demand for local services and increased employment, aligning with broader employment trends. Mitigation measures and sustainable use of resources will help manage this increased demand.

6.5 Residual Effects

The mitigation strategy above recommends actions which can be taken to reduce or offset the scale, significance, and duration of the effects on the surrounding population.

Population

The Proposed Development is not expected to have any significant adverse effect on the local population.

Employment

The development will create new employment opportunities, boosting local businesses and services.

Community

The Proposed Development is unlikely to adversely affect the local demography and will have positive economic effects.

Human Health

The proposed development has been designed in line with good industry practice, and, as such, mitigation against the risk of accidents/injuries is embedded through the design and in accordance with planning and legislative requirements.

Provided the actions and procedures outlined in **section 6.7** are rigidly adhered to, the proposed development will have no likely significant adverse effect in relation to pest control, whether direct or indirect on the surrounding areas during the construction or operational phases.
Following implementation of the mitigation measures proposed in **section 6.7**, the residual effects are anticipated to be ***negative, slight and long-term*** effects on the Pest Control.

Various human health parameters discussed in this chapter also interact with many other aspects of the environment e.g. air, odour, climate, noise and vibration. The residual effects in relation to these aspects has been discussed in **Chapter 9 – Air, Odour and Climate,** and **Chapter 10 - Noise and Vibration.**

Following implementation of the mitigation measures as outlined in those chapters, the residual effects to human health as a result of air, odour and climate, and noise and vibration, are anticipated to be, **neutral to negative, imperceptible to slight, and temporary to long term**.

Residual Effects Summary

The overall effect anticipated during the construction phase of the project following the implementation of suitable mitigation measures is considered to be ***neutral to positive, imperceptible to slight,*** and ***long-term***.

6.6 Summary of Significant Effects

The aspects for this assessment are considered to be the Population, Employment, Community, and Human Health. Whilst the development proposals have the potential to cause detriment to the sensitive receptors identified, the recommended mitigation measures will ensure that the risk of potential effects are reduced to levels which are ***negligible***.

Chapter 6 of Volume 2 of the EIAR assesses the likely significant effects of the proposed development on Population and Human Health, with reference to population, human heath, employment, and community. The assessment methodology involves a thorough desktop study and fieldwork, utilizing guidelines from the EPA, European Commission, and the Institute of Environmental Management and Assessment (IEMA). The primary goal is to ensure that the development's effects on human health and welfare are comprehensively evaluated and mitigated.

7 Land, Soil & Geology

ORS conducted an assessment of the likely impact of the Proposed Development on the Land, Soil and Geology within the Proposed Development site and the wider region.

7.1 Receiving Environment

Topography

The Proposed Development site is found in the townland of Moneylane, Arklow, Co. Wicklow. approximately 2.1km southeast of the town of Arklow, Co. Wicklow and approximately 23km southwest of Wicklow Town, Co. Wicklow. The Proposed Development locality is characterised as part of an extensive area of cultivated lowlands, stretching from the coastline to the interior hills. The immediate vicinity is characterised by a lowland landscape with flat to gently undulating sediments. Regarding site topography. the site peaks at 51.928 m AOD at the southernmost boundary and slopes gradually northward to approximately 46.5 m AOD at the northern boundary.

The proposed development site is within the “Corridor Area East”, bordering to the South with Rolling Lowlands. Considering a 2.0 km radius from the Proposed Development, there are also a small portion of Area of High Amenity (AHA) named as Southeast Mountain Lowlands *ca.* 1.7 km to the North of the Proposed Development, and *ca.* 780 m to the East, the urban area of Arklow Town & Environs.

Drift Geology

The General Soil Map of Ireland describes the region as predominantly consisting of Gleys (90%) with associated Grey Brown Podzolics (10%). The parent material is believed to be glacial muds of Irish Sea origin, while the site itself is underlain by till derived exclusively from Lower Palaeozoic sandstones and shales.

Regional Bedrock Geology

The bedrock geology within the County of Wicklow is diverse, with presence of fifteen different bedrocks, classed into five primary units. These units range from granite underlying much of the Wicklow mountains, greywackes and quartzites in the Bay Head area, and shales, mudstones, and siltstones in the Eastern region of Wicklow. Wicklow is renowned for its diverse range of igneous intrusions, which include granites, diorites, appinites and andesite.

Local Bedrock

The bedrock within the Proposed Development site area is predominantly comprised of the Kilmacrea Formation (KA), known for its role as an aquifer in the Redcross area of the County. The formation is composed of Ordovician metasediments, predominantly fractured and weathered shales. The underlying bedrock is known as dark grey and black mudstones, slates and shales with occasional pale grey sandstones and tuffs. The rocks of this formation are extensively jointed, fractured and weathered. This results in higher permeabilities closer to the surface, and along fault zones.

The bedrock geology and linework on the 1:100,000 scale mapping from the (GSI) indicate the

presence of a number of geological linework features (e.g. unconformity, faults, etc.) within the 2 km study area. The nearest unconformity is situated *ca.* 270m to the north-east of the Proposed Development, extending from north to south. The second is located *ca.* 400m to the south, extending from east to west.

Depth to Bedrock

An assessment of the GSI groundwater vulnerability maps and local groundwater wells data was undertaken. there are 28 groundwater wells within the 2 km study area. All of these groundwater wells are defined as Boreholes. There are no wells on the Proposed Development or within 500m. Groundwater wells within the wider area have a varying yield class from excellent to poor.
The lands on which the Proposed Development is located have been assigned a variety of vulnerability ratings ranging from moderate along the centre-northern area and high along the southern portion of the Proposed Development. The recorded depth to bedrock encountered for the corresponding wells in the wider area are generally between 1.4m to 91.4m below ground level (bgl).

Bedrock was not encountered in in the four trial pits dug as part of the site investigation, and so the bedrock is estimated to lie deeper than 4 m. Groundwater was discovered only in Trial Pit 2 (TP02) at a depth of 3.0 m.

Karst Features

No karstic features are present within the Proposed Development site or its immediate vicinity. Potential karst areas may exist within the broader 2 km study area due to the presence of groundwater vulnerability zones classified as "Rock at or near Surface or Karst" in some surrounding locations.
The closest of these zones are approximately:

- 460 m, 680 m, and 780 m to the northeast;
- 670 m and 880 m to the north;
- 680 m to the south-southeast; and
- 1.1 km to the southwest.

County Wicklow has only one recorded karst landform, identified as a cave in Deerpark.

Soils & Subsoils

GSI online mapping indicates that the site overlies soils classified as Macamore, present across the whole Proposed Development and over a range of 200m from the Proposed Development boundary. These soils, derived from sea drift material are poorly-drained. This condition must be attributed in part to the high clay content particularly in the lower depths. The soils of this series, which are of a sandy loam to sandy clay loam texture and of a medium base status, have been classified as low-humic podzolic gleys. The profile is distinguished by a dark greyish-brown surface horizon of sandy loam to sandy clay loam texture, with deeper horizons of a "heavier" texture that are typically grey and strongly mottled. The weak structure and the 'heavy' texture of the subsoil are the primary factors responsible for the poor drainage of these soils. For this reason, they are classified as surface-water Gleys
The till is described as diamicton, which relates to its terrigenous sediment that is unsorted to poorly sorted and contains particles ranging in size from clay to boulders, suspended in an unconsolidated matrix of mud or sand. This unsorted matrix is due to glaciation. These subsoils

are present practically all over the 2 km area of Study. In the area of Arklow Town there are Made subsoil, and to Northeast and Southeast there are Sandstone and shale till (Lower Paleozoic) with matrix of Irish Sea Basin origin subsoils (IrSTLPSsS).

Soil Contaminants

No contaminants were observed on site during the site investigations. The site is greenfield with no recorded previous development within the site boundary There are three Integrated Pollution Prevention Control (IPPC) facilities within the study area, two of them with surrendered licenses, one for Vitra (Ireland) Limited (P0823-01), located 817 m to the Southeast of the Proposed Development and one for Servier International B.V (P0128-01), located *ca.* 1.5 km to the Southeast of the Proposed Development. The third, and active license is Sigma-Aldrich Ireland Limited, (P0089-06), is located *ca.* 1.9 km North from the Proposed Development. It is not foreseen that these licensed facilities will have an effect on the Proposed Development.

Historic Land Use

The historic maps indicate no obvious sources of contamination based on previous land use within the Proposed Development site. The 25-inch historic maps (1863-1924) indicate that the area in the immediate vicinity of the Proposed Development site consists of agricultural lands. A disused clay pit is located *ca.* 770 m to the West of the site. A disused quarry is located *ca.* 809 m, also to the West of the site. A corn mill is noted *ca.* 670 m to the north of the site. In subsequent maps of the area, none of these structures have had visibly lasting impressions or effects on the environment.

Site Investigation

The results of the trial pits installed as part of the site investigation are shown below in **Table NTS 7.1**.

Table NTS 7.1: Soil Profile of Trial Pits

Location	Depth (m)	Ground Profile	Comments
TP 01	0.0-0.7m 0.7-2.0m 2.0-2.8m 2.8m	Brown Earths, - gravelly silty LOAM Lighter SAND/CLAY, occasional subangular gravel and cobbles. Hardpan (iron) layer present and obvious mottling. In summary: Podzolic soils with leached light-coloured sandy layer (A horizon). Accumulation (B horizon) – darker layer throughout due to accumulation of Organic matter & Hardpan Iron oxidised layer. Brown LOAMY/ CLAY soil, granular cobbles (shale) abundant. END OF TP	Trial Pit located at proposed Attenuation Pond area. No GW or Bedrock encountered. Well drained land with obvious leaching and a low water table. Bedrock adjudged to be >4m depth.
TP-02	0.0-0.8m 0.8-1.5m 1.5–2.0m 2.0-2.8m	Brown Earths - gravelly silty LOAM Podzolic soils: A horizon: light coloured orange SAND/ Grey leached light coloured SILT containing gravels. B horizon: Dark OM heavy layer.	Trial Pit located at proposed Tank Farm Area. No Bedrock encountered. GW Encountered at 3.0mbgl.

	2.8-3.1m	Podzolic soils – gravelly silt, more subangular cobbles present.	Well drained land with obvious leaching and perched water table. Bedrock adjudged to be >5m depth.
TP-03	0-0.4 0.4-0.9m 0.9-3.0m 3.0m	Brown Earths - gravelly silty LOAM Lighter gravelly CLAY/SAND - occasional cobble. Ribbon test 12mm – high permeability soils. Hardpan layer present. Dark Brown SILT, subangular Shale. Small boulders present. End of TP	Trial Pit located at centre of site No Bedrock encountered. No GW encountered Well drained land with high permeability soils underlying. Bedrock adjudged to be >3m depth.
TP-04	0.0-0.5m 0.5-1.7m 1.7 -3.0m 3.0m	Brown Earths - gravelly silty LOAM Lighter gravelly SANDY/LOAM - occasional cobble. Ribbon test 18mm – high permeability soils. Dark organic heavy Hardpan layer present. Dark Brown SILT/LOAM – High Cobble/small boulder content. End of TP.	Trial Pit located at the proposed office building No Bedrock encountered. No GW encountered Well drained land with high permeability soils underlying. Bedrock adjudged to be >3m depth.

The site soil is predominantly Brown Earth with gravelly silty loam topsoil and podzolic subsoils rich in organic matter. While the site is characterised by well-drained, highly permeable soils, groundwater infiltration was observed at moderate depths. Bedrock, primarily dark grey slate, is generally deeper than 4.0 m but was encountered at 1.8 m bgl in TP04. The findings are detailed in **NTS 7.1.** It is important to note that the assessment followed a period of heavy rainfall, which may have influenced groundwater levels.

7.2 Assessment of Impacts

Receptor Sensitivity

The sensitivity of the receptors identified during the study of the Land, Soil & Geology features within the vicinity of the site are summarised in **Table NTS 7.2**.

Table NTS 7.2: Receptor Sensitivity

Receptor	Receptor Importance	Receptor Sensitivity	Rationale
Topsoil	Local Level	Moderate	The local topsoil is a brown earth, gravelly silty loam which is in abundance within the site. The site topsoil contains no known pollutants. The overall soil is of grassland improved, well drained land with high permeability.
Underlying Deposits	Local Level	Moderate	The development layout has been designed to utilise the existing site topography as far as possible **(241504-ORS-ZZ-00-DR-AR-200),** minimising the disturbance to the subsoil to achieve the desired site levels. Where possible, drift deposits will remain on site and be utilised as infill material. The underlying till deposit is a diamicton (poorly sorted containing particles ranging in size from clay to boulder)

			drift siliceous stone parent material which is in abundance within the wider area. The site is located across a GSI designated flat to undulating sediments.
Bed Rock Geology	Local Level	Moderate	The underlying bedrock is composed of Ordovician metasediments, predominantly fractured and weathered shales. The formation is distinguished by a gradation in permeability, exhibiting higher permeability in the upper layers and a decline in permeability with depth. Bedrock is adjudged to be deeper than 3m below ground level. The underlying aquifer is classified as being locally important.

Construction Phase

The construction phase is likely to yield the most potential impacts on the surrounding land, soil & geology. Potential construction phase impacts are considered in detail in **Section 7.5.3** of the EIAR – Main Report and summarized in **Table NTS 7.3** below

Table NTS 7.3: Construction Phase Effects (Unmitigated)

Receptor	Potential Environmental Effects	Quality	Significance	Duration
Topsoil	Topsoil Removal	***Negative***	***Slight/ Moderate***	***Reversible***
	Access Road Adjustments and Gas Pipeline	***Negative***	***Slight***	***Temporary***
Underlying Deposits/ Subsoil	Construction of Built Structures	***Negative***	***Moderate***	***Long-term***
	Excavation/ Subsoil Removal	***Negative***	***Moderate***	***Permanent***
	Wetland	***Negative/ Neutral***	***Moderate***	***Permanent***
	Contaminated Soils	***Negative***	***Not Significant***	***Temporary***
	Access Road Adjustments, Drainage Pipe and Gas Pipeline	***Negative***	***Slight***	***Permanent***
Bed Rock Geology	Excavation of Bedrock	***Negative***	***Significant***	***Permanent***

Operational Phase

The operational phase effects anticipated and considered throughout the lifetime of the operation of the facility are considered in detail in **Section 7.5.4** of the EIAR – Main Report and summarized in **Table NTS 7.4** below.

Table NTS 7.4: Operational Phase Effects (Unmitigated)

Receptor	Potential Environmental Effects	Quality	Significance	Duration
Topsoil	Nutrient Leaks	**Negative**	**Slight**	**Short-term**
	Land Spreading of Digestate	**Positive**	**Slight**	**Long-term**

	Attenuation Pond	**Neutral**	**Moderate**	**Permanent**
Bed Rock Geology	Hydrocarbon Contamination	**Negative**	**Moderate/ Significant**	**Long-term**

7.3 Mitigation Measures

Construction Phase

General Mitigation Measures

A summary of all mitigation measures for the construction phase to ensure maximum protection of land, soil & geology receptors are listed below:

- Construction Environmental Management Plan.
- Site preparation and construction will be confined to the Proposed Development only.
- Prior to the commencement of developments on site, the PSCS/ ECoW will ensure that contractors will be made aware of the sensitive receptors identified in the EIAR. 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.
- A wheel wash/ power wash facility will be established.
- Dirty equipment will be refused entry to site.

Topsoil Removal

- Excavated topsoil will be stockpiled in an area abounded by silt fencing to contain/ reduce any sediment run-off during times of inclement weather.
- Driving machinery on topsoil stockpiles is not advised as it damages the soil structure, reduces porosity, and subsequent percolation rates, and can result in ‘smearing’ of the soil surface, which prevents water infiltration into the soil.
- Any excess topsoil will be removed from site and disposed of appropriately.
- Stockpiling and slight compaction of stockpiles to minimise both hydraulic and climatic erosion.
- Running stockpiles in the direction of prevailing wind to minimise windborne erosion rates, SW-NE. (EPA, 2013).
- Construction of silt fences around topsoil stockpiles to contain sediment run-off.
- Minimise the export of topsoil off site by incorporating in the final landscape design.
- Minimise handling and tracking of material to maintain optimum soil structure.
- Landscaping to take place as soon as possible to reduce exposure of subsoil and topsoil
- stockpiles.
- Works will be avoided during periods of extended rainfall.
- All topsoil generated from site works should be stored within the site until it is required for landscaping. It must not be stored outside the site boundaries and it must not be used for the infilling of any area outside of the 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.

Excavation

- Excavation work will be conducted in stages to minimise the exposure of unprotected soil, subsoil and bedrock.
- Where possible excavated subsoil material will be reworked and used on site.
- A geotechnical investigation of the site will be required in order to assess the potential of the underlying soil, subsoil and bedrock for reuse.
- Stockpiling material in appropriate locations, away from water sources, with a silt fence surrounding it to reduce the rate of run-off from hydraulic conditions.
- Light compaction of stockpiles to minimise the rate of erosion from climatic methods.
- Stockpile heights should be kept to a minimum to ensure stockpile stability and minimise wind borne erosion.
- Excavations will be postponed in high rainfall conditions to reduce the risk of excavation collapse and erosion to soil and subsoil profiles.
- If extreme weather conditions are forecast high sediment stockpiles will be covered to minimise erosion.
- Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants
- to the subsurface and bedrock.
- All temporary excavations will be conducted in a safe manner to ensure sidewall stability and prevent collapse of excavations. Mobile shoring equipment will be utilised to this end where required.
- All long-term soil stockpiles are to be planted with a vegetative cover to bind the soil and improve slope stability.
- Engineered retaining walls are to be installed where required to ensure stability of contiguous and site topography

Soil Compaction

- Construction of a hardcore gravel access road on and around the site.
- Confine site traffic to designated routes.
- Minimise traffic flows on site and establish a construction stage parking compound.
- Avoid the use of oversized machinery when and where possible.
- Prevent movement of vehicles on site during and after periods of rainfall.
- Driving machinery on topsoil stockpiles will be avoided as it damages the soil structure, reduces porosity, and subsequent percolation rates, and can result in ‘smearing’ of the soil surface, which prevents water infiltration.

Run-Off

- As a standard best practice measure, a silt fencing will be erected along the northern extents of the site to limit accidental discharge of sediments into the Rooaun Stream (Rooaun 10 Stream runs underground in the field adjacent to the proposed site northeast boundary and emerges through a pipe into the Moneylane 10 Stream, located *ca.* 115 m to the northeast of the site). The fencing is to be made of a permeable filter fabric (Hy-Tex Terrastop Premium silt fence, or similar), with the footing of the fencing to be buried into the ground and the visible fencing to be *ca.* 0.5 m high.
- An interceptor trench will be installed in front of the silt fence.
- The silt fence will be visually inspected daily to ensure that they remain functional throughout the construction of the site. Maintenance of the fences will be carried out regularly. Fences will be inspected thoroughly after periods of heavy rainfall.
- Excavated and/or imported material will be stockpiled and silt fencing will be

constructed around stockpile locations to contain/ reduce any sediment run-off during times of inclement weather.
- Compacting of stockpiles will reduce the rate of airborne and hydraulic erosion.
- Stockpile areas for sands and gravel should be kept to minimum size, well away from storm water drains and gullies leading off-site.
- Silt Fences to be erected where excavation works are required in close proximity to water features and along depressions in land where there's increased surface water flow rates.
- Harmful materials such as fuels, oils, greases, paints and hydraulic fluids must be stored in bunded compounds well away from storm water drains and gullies. Refuelling of machinery should be carried out using drip trays.
- A temporary drainage system will be established complete with a settlement pond to remove contaminants from run-off, prior to discharge.
- Temporary staff welfare facilities will be installed on site at the pre-commencement stage. These will include toilet facilities. All foul discharges from welfare facilities will be collected in a septic storage tank. This tank will be regularly emptied, and the contents disposed of at a registered facility.

Concrete

- 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 treated prior to discharge.
- The concrete washout skip is to be located to the east of the site, where the overburden is greater.
- Excavations lined with an impermeable liner are not permitted as concrete washout bays.
- Large excess loads of concrete are to be returned to the supplier or poured into concrete block moulds (Betonblock or similar design) in order to minimise waste and reduce the risk of contaminants leaching into the surrounding environment.
- Best practice in bulk-liquid concrete management should be employed on site addressing pouring and handling, secure shuttering, adequate curing times etc.
- Where concrete shuttering is used, measures will 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 will be controlled by dampening down the areas.
- Raw and uncured waste concrete will be disposed of by removal from the site.

Construction Contaminants

- Fuels, oils and other environmental deleterious chemicals are to be stored in a bunded well-ventilated chemical stores.
- Use of such chemicals and fuels is to be contained to bunded areas, where possible.
- Fuel bowsers to be located in bunded areas which can cater for 110% of the primary vessel capacity.
- Any spills or leaks to the soil is to be immediately contained and the soil in question is to be removed by a licensed contractor and disposed of in a registered facility.
- Oil spill containment kits are to be situated near areas of potential spills.
- Regular inspections carried out on plant and machinery for leaks and general condition.

- Use of ready-mixed supply of wet cement products.
- Scheduling cement pours for dry days.
- Maintenance and repair works will be carried out at least 10 m from any collection of surface water.
- No refuelling will be undertaken within 50 m of the Rooaun Stream (the small stream to the northern boundary of the site, which joins the Moneylane 10 stream).
- Ancillary machinery equipment such as hoses, pipes and fittings which contain hydrocarbons will be stored within a bund or drip tray.
- Any repair works required on machinery involving fuel and oil control will be carried out offsite where practical, if not possible then repairs will be undertaken on a clean hardcore area of site. Unless unavoidable, repair works carried out in the field where machinery is operational will use spill trays and absorbent materials to prevent release of contaminants to the ground.
- Daily checks prior to start-up of plant and machinery will minimise the risk of breakdown and associated contamination risks for on-site repairs. Daily pre-start checks will be undertaken and records maintained. A clean site policy and diligent housekeeping will also reduce the potential of hydrocarbon release on-site.

Importation of Contaminated Materials

- All material will be sourced and transported by registered suppliers.
- All materials will be inspected prior to acceptance on site.
- Any deliveries found to be contaminated will be refused access to deposit on site. Any contaminated materials accidentally deposited on site will be removed immediately from site. If this is not possible then it will be stored in a “quarantine zone”.
- The quarantine zone is to be lined with an impermeable liner which the material will be stored on. A cover will be placed over the liner to avoid hydraulic run-off of contaminated materials. The quarantine zone is to be fenced off and surrounded by silt fencing, as a secondary containment measure.

Excavation of Contaminated Soils

- All excavated materials will be visually assessed for contamination.
- Any contaminated material detected will be sent for analysis to a suitable environmental laboratory and subsequently quantified, segregated and transported for disposal by a licenced contractor.

Operational Phase

A summary of all mitigation measures for the operational phase to ensure maximum protection of land, soil & geology receptors are listed below:

General Mitigation Measures

- 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

Uncontrolled Releases and Spillage of Biobased Fertiliser and Feedstocks

- 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 Plan (EMP) to include site specific standard operating procedures pertaining to waste management and emergency response.
- There will be no intentional discharge of untreated storm water to surface or ground waters during the operational phase. All stormwater discharges from site will be via the attenuation pond with all areas, with the exception of the roofs, being directed through Class 1 petrol/oil interceptors before passing through the attenuation pond prior to discharge.
- The Digestion Tanks and Digestate Storage tanks will be located within a bunded location to the east of the site, this will act as a secondary containment in the event of loss of tank contents.
- All primary pipelines and bunded structures will be inspected and integrity tested prior to handover from the appointed construction contractor. All works will be installed to Construction Quality Assurance (CQA) plan.

Land Spreading of Biobased Fertiliser

- In order to avoid any reductions in water quality within the catchment as a whole, all biobased fertilisers must be used in accordance with S.I. 113 of 2022 European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2022).
- The spreading of the biobased fertiliser on the customer farms must be done in accordance with the specific Nutrient Management Plan for that farm.
- Application of biobased fertiliser to be conducted in compliance with the Nitrates Action Programme (e.g. prohibited periods and nitrogen application rates).
- All biobased fertiliser is to be pasteurised prior to removal from the site to comply with Regulation (EU) 142/2011 on Animal By-Products in Organic Fertilisers.

7.4 Residual Impacts

Construction Phase

A summary of the predicted impacts associated with the construction phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual impacts are summarised in **Table 7.13** in Chapter 7 of the EIAR – Main Report.
The overall impact anticipated by the construction phase of the project following the implementation of suitable mitigation measures is considered to be ***neutral to negative***, ***slight to moderate*** *and* ***temporary to permanent***.

Operational Phase

A summary of the predicted impacts associated with the operational phase in terms of quality,

significance, and duration, along with the proposed mitigation measures and resulting residual impacts are summarised in **Table 7.14** in Chapter 7 of the EIAR – Main Report.
The overall impact anticipated by the operational phase of the project following the implementation of suitable mitigation measures is considered to be ***positive to neutral***, ***imperceptible to slight***, *and* ***temporary to permanent***.

8 Hydrology and Hydrogeology

ORS conducted an assessment of the likely impact of the proposed development on the hydrological and hydrogeological environment (collectively known as the water environment) within the proposed development site and the wider region.

The Proposed Development site is located in the townlands of Moneylane, Arklow, Co. Wicklow.

The objectives of this chapter (Chapter 8 - Hydrology & Hydrogeology) are:

- To provide a baseline assessment of the receiving water environment in terms of surface water (hydrological) and groundwater (hydrogeological) receptors.
- To identify any potential negative effects posed by the construction and operational phases of the Proposed Development.
- To propose suitable mitigation measures to prevent or reduce the significance of the negative effects identified.
- To consider any significant residual effects of cumulative effects posed by the Proposed Development.

8.1 Receiving Environment

The following aspects relating to hydrology & hydrogeology were assessed:

- Topography
- Drift Geology
- Regional & Local Bedrock Geology
- Regional & Local Hydrology
- Regional & Local Hydrogeology
- Protected Areas
- Flood Risk
- Water Quality

The site sensitivity was considered to be low in most instances with the exception of: Groundwater Vulnerability (the southeastern portion has high groundwater vulnerability). This area lies above the Wicklow Groundwater Body, classified as a locally important aquifer with

bedrock that is moderately productive in certain local zones.

Local Hydrology

The Proposed Development is located in the Ovoca-Vartry Catchment (Hydrometric Area 10), within the sub catchment 10_9 of the Blackwater (Munster) river catchment, also identified as Avoca_SC_020 sub-catchment.

The main water feature near the proposed development site is the Moneylane Stream (EPA designation: *Moneylane 10*), which is about 490 m north of the site within the Ballyduff sub-basin. This sub-basin drains an area of 13.9 km² and also includes the Ballyduff Stream (EPA designation: *Ballyduff (Stream) [Wicklow]_010*), located approximately 415 m northwest of the site. The River Avoca is located around 2 km north of the site.

Additionally, EPA maps indicate that a small stream, known as Rooaun 10, is located in the field adjacent to the northeastern boundary of the site. During preliminary site investigations, no surface flow was observed despite the wet conditions at the time. It was confirmed that the stream flows underground, re-emerging through a pipe at the field's edge before discharging into the Moneylane Stream.

The drainage at the site follows its natural topographical gradient, with the primary flow direction moving northward. During the site investigation, a ditch was identified along the northern boundary, functioning as a drainage channel during periods of rainfall. However, this ditch does not exhibit regular flow and therefore does not qualify as a watercourse. Instead, it serves solely as a drainage feature to manage surface runoff from the site and its surrounding area.

The proposed site is not located near any Arterial Drainage Scheme (ADS), Drainage District (DD), or their benefitting lands.

Protected Areas

There are three Natura 2000 sites and eight proposed nationally important sites (also known as NHAs) within a 15 km radius of the development.

The nearest proposed Natural Heritage Area (pNHA) is the Arklow Town Marsh, located approximately 2.3 km northeast of the Proposed Development. This is the only protected area hydrologically connected to the site. The connection is established via the Rooaun Stream, approximately 20 meters north of the development, which flows into the Moneylane Stream—a tributary of the Ballyduff Stream. The Ballyduff Stream subsequently joins the Avoca River, which flows into the Arklow Town Marsh pNHA, about 3.4 km downstream of the Proposed Development.

Flood Risk

The Preliminary Flood Risk Assessment (PFRA) identified no significant risk of groundwater or pluvial flooding near the proposed site. While Arklow town has a high flood risk due to historic events and fluvial/coastal hazards, the proposed site is outside the areas identified in flood risk mapping, including those from the CFRAM Studies and NIFM scenarios.

The nearest potential fluvial flooding is 340–500m away, with no predicted risk of extension toward the site, even under future scenarios. No groundwater flooding is expected on or near

the site. As a result, the site is classified as Flood Zone C, where flood risk is low, and construction is not expected to increase flood risk.

Biological & Chemical Water Quality

The River Avoca (upstream and downstream of the site) is classified as 'Moderate' under the Water Framework Directive (WFD) and is not considered at risk. The 2024 Draft Ovoca-Vartry Catchment Report identifies historic mine pollution as the main pressure on the river, with industrial discharge and urban wastewater also contributing, according to earlier assessments.

The Ballyduff Stream, also classified as 'Moderate' under the WFD (2016–2021), is considered "At Risk" due to ecological and chemical concerns. Agricultural activities are identified as the primary pressure, with urban wastewater also contributing to pollution.
Nearby waterbodies have shown fluctuations in quality, ranging between Poor and Moderate status over multiple monitoring cycles. The Ballyduff Stream briefly improved in the previous cycle but returned to Poor status in 2024, indicating a possible decline.

A Q-value assessment was performed on the Moneylane Stream. The upstream sample from Moneylane received a Q-value of Q4, which suggests a WFD status of "Good," a pollution status of "Unpolluted," and a condition rating of "Satisfactory." In contrast, the downstream sample was assigned a Q-value of Q3, indicating a WFD status of "Poor," a pollution status of "Moderately Polluted," and a condition rating of "Unsatisfactory."

ORS attended site on the January 13th, 2025, and obtained baseline hydrochemistry samples along the Moneylane Stream upstream (U/S) and downstream (D/S) of the Proposed Development.

Results indicate that the Moneylane Stream exceeds the threshold for achieving a "Good" status under the Water Framework Directive (WFD). This finding aligns with the most recent WFD assessment, which classified the stream as having a "Moderate" status and designated it as "At Risk." To ensure a comprehensive evaluation of local water quality and to assess the potential impacts of the Proposed Development on the receiving hydrological environment, hydrochemical data from the Ballyduff Stream downstream of its confluence with the Moneylane Stream (Monitoring Station: **RS10B010200**) was considered in the analysis along with the results from the site-specific samples collected by ORS. This combined dataset, incorporating select EPA parameters and ORS-collected samples, offers a comprehensive basis for evaluating water quality.

An overview of the description of receiving waters (Ballyduff Stream) is presented in **Table 8.9** (**Chapter 8 – EIAR Main Report**)

Local Hydrogeology

The site is located above the Wicklow Groundwater Body, which is classified as a Locally Important Aquifer with moderately productive bedrock in certain local areas. Most of the site has a moderate groundwater vulnerability, meaning the subsoil is at least 10 meters thick. However, the southeastern portion of the site has a high groundwater vulnerability, where the subsoil thickness ranges between 3 and 10 metres.

There are no groundwater wells located within the boundaries of the proposed site or within a 500-meter radius. The GSI database identifies 27 no. groundwater wells within a 2 km radius of

the site, the majority of which are boreholes. Where specified, the primary use of these wells is for domestic purposes. The depth to bedrock for these wells ranges from 0.9 to 15.5 mbgl, while their overall depths vary between 1.5 and 120 mbgl. A full list of Groundwater Wells located within a 2km radius of the proposed development is outlined in **Table 8.9** (Chapter 8 - EIAR Main Report).

According to the 2016 Drinking Water Audit Report, three out of 14 boreholes in the Arklow Water Supply Scheme were used for water extraction at the time of the audit. The water is sent to the Arklow Water Treatment Plant for treatment before being distributed to the local population. However, the exact location of these boreholes is not shown on GSI maps, and there is no documented information on any Source Protection Zones or safeguarding measures. The only available location information comes from a sketch provided by Engineers Ireland related to the AWSS upgrade.

No Source Protection Areas (SPA) or karstic features hydrologically connected to the proposed site were identified in the surrounding area. The nearest SPA is the Coolgreany Public Water Supply Scheme (PWS), located about 3.4 km southwest of the site. Given that County Wicklow lacks karstified aquifers, karstic features are rare in the region and, therefore, not relevant to the site.

Site-Specific Ground Investigations

Ground investigation works were carried out by a chartered ORS environmental scientist for the Proposed Development at Moneylane on the October 3, 2024, and the main findings are as follows:

- The depths of the trial pits varied slightly from 2.8 mbgl to 3.0 mbgl.
- Bedrock was not encountered at any trial pit.
- Groundwater was observed only in TP02, at a depth of 3.0m.
- Water seepage was noted at 1.8mbgl on Trial Pit 1, located at the centre of the site, but no water was found.
- Topsoil across all pits were classified as brown earth, consisting of gravelly silty loam, with slightly variations between the pits.
- Subsoil characteristics varied, with TP01 having a sand/clay layer, TP02 exhibiting podzolic soils with distinct horizons, and TP03 and TP04 containing gravelly clay or sandy loam with occasional cobbles.
- The underlying soils are mineral-based composed of dark grey slates, shales, and occasional sandstones.
- Groundwater infiltration was observed in TP04 at 1.8mbgl. Soil depths across the site range from 1.9m to 2.3m, with well-drained, highly permeable soils predominating.

The investigations revealed a slight difference from the general geology and subsoil conditions shown on geological maps. This may be due to the broad nature of the EPA/GIS/Teagasc mapping, as the county has not been fully surveyed, and the maps rely on extrapolated data. Additionally, the resolution limitations of the geological maps and the site's location near a transition zone between two soil associations may contribute to the variance. Overall, the findings indicate a consistent hydrogeological profile across the proposed site.

An additional trial pit was excavated to a depth of 2.1 as part of the site characterization (percolation) assessment, conducted from November 16th to 19th, 2024. No bedrock was encountered. The water table was recorded at 1.85 metres, with water seepage observed at 1.3 metres. It is important to note that the assessment took place after a period of heavy

rainfall, which may have impacted the groundwater levels.

Site Vulnerability

From desktop and field investigations it can be determined that the Proposed Development is located on a locally important aquifer and has been assigned a vulnerability rating of moderate to high. The groundwater protection response matrix assigns the site a vulnerability rating of "R1," indicating that the development location is acceptable in terms of groundwater protection.

The results obtained from the site investigation indicate a relatively uniform hydrogeological profile across the site and confirmed the presence of a soil/subsoil layer of at least 1 meter overlying the aquifer, which would be ideal for areas above locally important aquifers. Therefore, it is not anticipated that the proposed facility's operation will have any adverse effects on the underlying aquifer or nearby wells and no additional trial pits are deemed necessary before work commences on site.

No land spreading will occur on site. The farms of the customer farmers have been identified. All farmers will use the biobased fertiliser on lands that have an agronomic requirement for fertiliser.

8.2 Assessment of Impacts

Receptor Sensitivity

The sensitivity of the receptors identified during the study of hydrological and hydrogeological features within the vicinity of the site are summarised in **Table NTS 8-1**.

Table NTS 8-1: Receptor Sensitivity

Receptor	Receptor Importance	Receptor Sensitivity	Rationale
Groundwater	Local Level	Moderate	The Wicklow Groundwater Body (GWB) is classified as a Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones (Ll). Groundwater flow in this area is primarily local, with flow paths typically spanning a few hundred meters before discharging into nearby surface water. While the limited flow reduces the spread of contamination and supports effective mitigation, there is still a risk of contaminants reaching surface water bodies, including the hydrologically connected Arklow Town Marsh, a proposed Natural Heritage Area (NHA). The GSI map viewer classifies the site's groundwater vulnerability predominantly as "Moderate," with a small area of "High" vulnerability concentrated along the southern boundary. Site investigations reveal a consistent hydrogeological profile across the area. Groundwater was encountered in just one trial pit at a depth of 3mbgl, verifying the presence of at least a 1-meter layer of soil or subsoil in areas overlying Locally Important Aquifers. The response matrix would indicate that vulnerability rating assigned to the site would be “R1

Receptor	Receptor Importance	Receptor Sensitivity	Rationale
			Acceptable, subject to normal good practice", indicating the development location is acceptable with respect to groundwater protection.
Surface Water	Local Level	Moderate	The receiving water bodies, the Moneylane and the Ballyduff streams have a WFD status of "Poor", a pollution status of "Moderately Polluted", and a condition of "Unsatisfactory" (Q3). Upstream of its hydrological connection with the Proposed Development, the Moneylane Stream supports moderately sensitive macroinvertebrate species. However, downstream of its confluence with the Rooaun Stream, the water quality declines, as evidenced by the presence of species very tolerant to pollution. The Ballyduff Stream is hydrologically connected to the River Avoca (*ca.* 2.9km downstream of the site) and to the Arklow Town Marsh proposed NHA along its banks, which is located *ca.* 3.4km downstream from the site. Significant effects on this protected area are not anticipated from the Proposed Development given the adherence to good housekeeping practices, the implementation of measures outlined in the accompanying CEMP, and effective pollution control and surface water management. With these precautions in place, the proposed development is not anticipated to significantly affect the ecological integrity of the Arklow Town Marsh pNHA.

Construction Phase

The construction phase is likely to yield the most potential impacts on the surrounding hydrology and hydrogeology. Potential construction phase impacts are considered in detail in **Section 8.5.3** of ***EIAR – Main Report*** and summarised in **Table NTS 8-2** below.

Table NTS 8-2: Construction Phase Effects (Unmitigated)

Receptor	Potential Environmental Effects	Quality	Significance	Duration
Surface Water Moneylane and Ballyduff streams, River Avoca & Arklow Town Marsh pNHA	Increased Run-off and Sediment Loading	**Negative**	**Slight to Moderate**	**Temporary**
	Accidental Spillages of Harmful Substances	**Negative**	**Moderate to Significant**	**Temporary**
	Excavation of Contaminated Soils	**Unlikely**	**Negligible**	**Unlikely**
	Conversion of Permeable Soils to Hard standing	**Negative**	**Moderate**	**Temporary**
Groundwater Wicklow Groundwater Body – Locally Important Aquifer	Increased Run-off and Sediment Loading	**Negative**	**Moderate**	**Temporary**
	Accidental Spillages of Harmful Substances	**Negative**	**Moderate**	**Short-Term**
	Increased Groundwater Vulnerability	**Negative**	**Significant**	**Long-Term**
	Excavation of Bedrock Aquifer	**Negative**	**Significant**	**Long-Term**
	Installation of Gas pipeline	**Negative**	**Significant**	**Long-Term**

Operational Phase

The operational phase effects anticipated and considered throughout the lifetime of the operation of the facility are considered in detail in **Section 8.5.4** of ***EIAR – Main Report*** and summarised in **Table NTS 8-3** below.

Table NTS 8-3: Operational Phase Effects (Unmitigated)

Receptor	Potential Environmental Effects	Quality	Significance	Duration
Surface Water Moneylane and Ballyduff streams, River Avoca & Arklow Town Marsh pNHA	Contaminated Run-off	**Negative**	**Moderate to Significant**	**Temporary**
	Foul Water	**Negative**	**Moderate to Significant**	**Short-Term**
	On-Site Flooding	**Negligible**	**Not significant**	**Unlikely**
	Conversion of Permeable Soils to Hard standing	**Negative**	**Moderate**	**Long-Term**
	Uncontrolled Releases & Spillage of Digestate and Feedstocks	**Negative**	**Slight to Moderate**	**Temporary**
	Fire and Resultant Firewater	**Negative**	**Slight to Moderate**	**Temporary**
	Landspreading of Biobased Fertiliser	**Negative**	**Slight**	**Temporary**
	Uncontrolled Release of Discharge	**Negative**	**Significant**	**Temporary**
	Attenuation Pond	**Negative**	**Moderate**	**Temporary**
Groundwater Wicklow Groundwater Body – Locally Important Aquifer	Contaminated Run-off	**Negative**	**Moderate**	**Short-Term**
	Foul Water	**Negative**	**Moderate to Significant**	**Short-Term**
	Increased Groundwater Vulnerability	**Negative**	**Significant**	**Long-Term**

	Uncontrolled Releases & Spillage of Digestate and Feedstocks	**Negative**	**Slight to Moderate**	**Temporary**
	Fire and Resultant Firewater	**Negative**	**Moderate**	**Short-Term**
	Landspreading of Biobased Fertiliser	**Negative**	**Slight**	**Short-Term**
	Attenuation Pond	**Negative**	**Moderate**	**Short-Term**

8.3 Mitigation Measures

8.3.1 Construction Phase

A summary of all mitigation measures for the construction phase to ensure maximum protection of groundwater and surface water receptors is listed below:

General Mitigation Measures

The Construction Environmental Management Plan (CEMP) accompanying this application will be implemented and updated (as required) by the main contractor during the construction phase. These are practical documents which will include detailed procedures to address the main potential effects on surface water and groundwater.

Increased Run-off and Sediment Loading

- 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.
- Covers are to be provided over soil stockpiles when high wind and inclement weather are encountered if required.
- Harmful materials and stockpiles should, whenever possible, be stored away from the drainage ditch located at the northern boundary of the site, given its direct pathway to nearby surface waterbodies.
- Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer.
- Landscaping should be carried out as soon as possible to minimize weathering.

Accidental Spillages of Harmful Substances

- Establishment of bunded oil and chemical storage areas.
- Refuelling of mobile plant in designated areas provided with spill protection.
- Fuel bowsers should be located within bunded areas designed to contain 110% of the primary vessel's capacity or 25% of the total volume of substances stored within the bunded area. They should not be placed immediately adjacent to the northern boundary of the site, given the presence of the drainage ditch, or in the southern portion, where groundwater vulnerability is higher compared to other areas of the site.
- 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.

Increased Groundwater Vulnerability / Excavation of Bedrock Aquifer / Gas Pipeline

- Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer.
- Landscaping should be carried out as soon as possible to minimize weathering.
- Installation of impermeable liner is recommended under the attenuation pond.
- Implementation of phased excavation with regular monitoring for groundwater levels to promptly identify and mitigate any breaches or increased vulnerability.
- Installation of temporary barriers around excavation sites to limit groundwater exposure.

Excavation of Contaminated Soils

- All excavated materials will be visually assessed for contamination.
- Any contaminated material detected will be sent for analysis to a suitable environmental laboratory and subsequently quantified, segregated and transported for disposal by a licenced contractor.

Conversion of Permeable Soils to Hard standing

- The rate of surface water discharge to the stream will be restricted to a maximum permissible rate of 10.7 lit/sec. This rate is calculated in accordance with criteria defined in the Greater Dublin Strategic Drainage Study [‘GDSDS’] to ensure the Proposed Development will not affect the flow / flood regimes in the receiving environment
- Floor levels upstream of the storage areas are at least 500mm above the top water level in the detention basins for the 100-year event.
- Overtopping does not occur during rainfall events ranging from 30 minutes to 1440 minutes. No risk of flooding of adjacent areas.
- Attenuation Pond will accommodate the total catchment area capacity and will provide a minimum storage capacity of 1,619.534 m^3 (designed to accommodate the estimated rainfall events)

8.3.2 Operational Phase

A summary of all mitigation measures for the operational phase to ensure maximum protection of groundwater and surface water receptors is listed below:

General Mitigation Measures

An Environmental Management System (EMS) will be prepared and implemented by the operator 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 facility’s lifespan.

Typical conditions relating to the protection of water receptors include:

- Site specific trigger levels will be established and agreed with the EPA.
- 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

Contaminated Run-off

- Overtopping from rainfall is concentrated at the detention basin only.
- Floor levels upstream of the storage areas are at least 500mm above the top water level in the detention basins for the 100-year event.
- Drainage systems will be designed to attenuate excess surface water runoff with suitable storage volumes
- Reduction of outflow rate to below the existing greenfield runoff rate before discharging into the watercourse from the attenuation pond.
- Sumps in gullies and manholes collect silts in run-off from roads
- Class 1 discharge bypass separator treats surface water for hydrocarbons run-off before its discharge to the attenuation pond
- All surface water run-off will discharge to the attenuation pond. The floor of the basin will be shaped to allow for the retention of silts in the pond.
- Regular inspection and maintenance of all treatment measures to remove accumulated silts and disposed of to an appropriately licenced landfill
- Regular testing prior to discharge to ensure treatment effectiveness.
- The digestion process area will be completely bunded and constructed to Eurocode standard (BS EN 1992-3)
- The rate of discharge to the stream will be restricted to a maximum permissible rate of 10.7 lit/sec. This rate is calculated in accordance with criteria defined in the Greater Dublin Strategic Drainage Study [‘GDSDS’] to ensure the Proposed Development will not affect the flow / flood regimes in the receiving environment.

Foul Water

- A domestic scale wastewater treatment plant is proposed to cater for the foul water arising from staff facilities on-site only.
- The wastewater treatment plant will comprise a secondary treatment system with a soil polish filter, followed by a percolation area.
- The 8 * 32mm lateral pipes are to be located at 1.25m intervals and placed over a (8-32mm) 250-mm layer of distribution stone and covered with 150mm of protection stone and this layer and entire stone footprint overlain by a geotextile with a min 250mm of topsoil back to new raised surface.
- The treatment plant will be specified and installed by an appropriately qualified technician and in accordance with EPA COP 2021. It also will be subject to regular desludging and maintenance, as per manufacturers recommendations. Pressure tests and CCTV surveys will be carried out prior to commissioning to ensure absence of defects.
- Programme of inspection and maintenance to ensure any defects are repaired.

Increased Groundwater Vulnerability

- The soil/subsoil layer thickness will be kept at 1m minimum as recommended for areas overlying Locally Important Aquifers.
- The site bunding is designed in accordance with IPC Guidance Note on storage and Transfer of Materials for Scheduled Activities (EPA, 2004)
- The tank farm area will be bunded in its entirety to ensure enough containment is provided in the unlikely event of a leak.
- The bund will be impermeable and provide the required storage volume i.e., a minimum of 110% of the largest single tank volume.
- 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.
- All bunds and pipelines (foul & process) will be subject to integrity assessments every 3 years by a suitably qualified engineer.

On-Site Flooding

- The proposed Finished Floor Levels are above the estimated 1 in 1000-year return period fluvial flood event placing the units within Flood Zone C
- The proposed stormwater management system is designed in accordance with industry standards and is projected to emulate the current greenfield runoff rates calculated at the site.

Increase in Flood Risk to Receiving Catchment

Drainage systems will be designed to attenuate excess surface water runoff with suitable attenuation volumes for the site and reduce the outflow rate to below the estimated greenfield rate before discharging.

- An attenuation pond is provided to facilitate the existing gradients on the site. The attenuation pond is designed for a 1:100-year event and well as to regulate the outflow from the site.
- Attenuation Pond will accommodate the total catchment area capacity and will provide a minimum storage capacity of 1,619.534 m^3 (designed to accommodate the estimated rainfall events)

The attenuation pond will discharge the storm water and a flow control valve at the outfall from the basin will deliver a max flow less than that of greenfield run off of 10.7 l/s.

Uncontrolled Releases & Spillage

- 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 or 25% of the total volume of the substance which could be stored withing the bunded area (in compliance with Guidance to storage and Transfer of Materials for Scheduled Activities,

EPA 2004)

- EMS to include site specific standard operating procedures pertaining to waste management and emergency response.
- Impermeable membrane liner will be installed under the attenuation pond to limit percolation of contents into the underlying regionally important karst aquifer.
- The entire tank farm area of the Proposed Development will be bunded.
- The Reception Hall, Digestate Storage building, and Nutrient Recovery Building will each be self-bunded.
- All bunds and underground pipelines (foul and process) will be subject to integrity assessments every 3 years by a suitably qualified engineer.
- Ongoing monitoring of stormwater discharge to the local hydrologic system.

Fire and Resultant Water

- A Firewater Risk Assessment will be commissioned within the first six months of operation and will determine the volume of firewater retention storage require on site.
- Adequate firewater retention capacity is installed and maintained on-site in the event of a worst-case scenario fire event.
- Firewater retention will be the containment bund and underground tank in the reception building.
- All retention infrastructure systems will be automatically activated in the event of a fire alarm being triggered.
- All retention tanks, etc., shall be maintained empty, or at least to a point where the required retention capacity is available.
- Bunds and tanks will be constructed to Eurocode standard (BS EN 1992-3:2006).

Uncontrolled Release of Discharge

Since no process water will be discharged off-site, the implementation of specific mitigation measures is not required.

Conversion of Permeable Soils to Hard standing

- Sustainable Urban Drainage Systems (SuDS) such as such as sediment chambers, oil traps into drainage ditches and attenuation ponds included.
- Drainage systems will be designed to attenuate excess surface water runoff with suitable storage volumes for the Proposed Development and reduce the outflow rate to below the estimated greenfield rate before discharging.
- An attenuation pond is provided to facilitate the existing gradients on the site. The attenuation pond is designed for a 1:100-year event and well as to regulate the outflow from the site.

Land Spreading of biobased fertiliser

- Nutrient management plans to avoid excess fertiliser application
- Farmers to comply with the Nitrates Action Plan
- “Lay-off” period of 21 days for grazing or harvesting following application
- Biobased fertiliser will be pasteurised in accordance with Regulation (EU) 142/2011 on use of animal by products as organic fertiliser.

Attenuation Pond

- The attenuation pond is designed for a 1:100 year event and well as to regulate the outflow from the site.
- Installation of Sustainable Urban Drainage Systems (SuDS) features such as: Sumps in gullies and catchpits collect silts in run-off from roads, filter drains, discharge bypass separator and an attenuation pond.

8.4 Residual Impacts

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 8.18** of the ***EIAR – Main Report***.

The overall impact anticipated by the construction phase of the project following the implementation of suitable mitigation measures is considered to be ***neutral*** to ***negative***, ***imperceptible*** to ***sligh***t, and ***temporary.***

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 8.19** of the ***EIAR – Main Report*.**

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

9 Air, Odour and Climate

ORS conducted an assessment of the likely impact of the proposed development on the air quality, odour and climate within the proposed development site and the wider region.

The Proposed Development site is located in the townland of Moneylane, Arklow, Co. Wicklow. The objectives of this chapter (Chapter 9 – Air, Odour and Climate) are:

- To provide a baseline assessment of the receiving air environment in terms of air quality receptors.
- To identify any potential negative effects posed by the construction and operational phases of the Proposed Development.
- To propose suitable mitigation measures to prevent or reduce the significance of the negative effects identified.
- To consider any significant residual effects of cumulative effects posed by the Proposed Development.

9.1 Receiving Environment

Site Location and Receptor Identification

A qualitative assessment of construction dust has been undertaken in line with the IAQM 2024 guidance. The study area for this assessment was 250m from the Proposed Development boundary and or within 50m of the roads used by construction vehicles on the public road up to 250m from the site entrance.

The first stage is to assess the requirement for an evaluation. The requirement for an assessment is based on distances of human and/or ecological receptors of the site.

Human receptors are within 250m of the site boundary with four of those also being within 50m of the trackout route; consequently, construction dust does have the potential to cause an effect on these receptors. No designated ecological receptors are within 50m of the trackout route or site boundary; therefore, construction dust will not have the potential to effect adversely on ecological receptors.

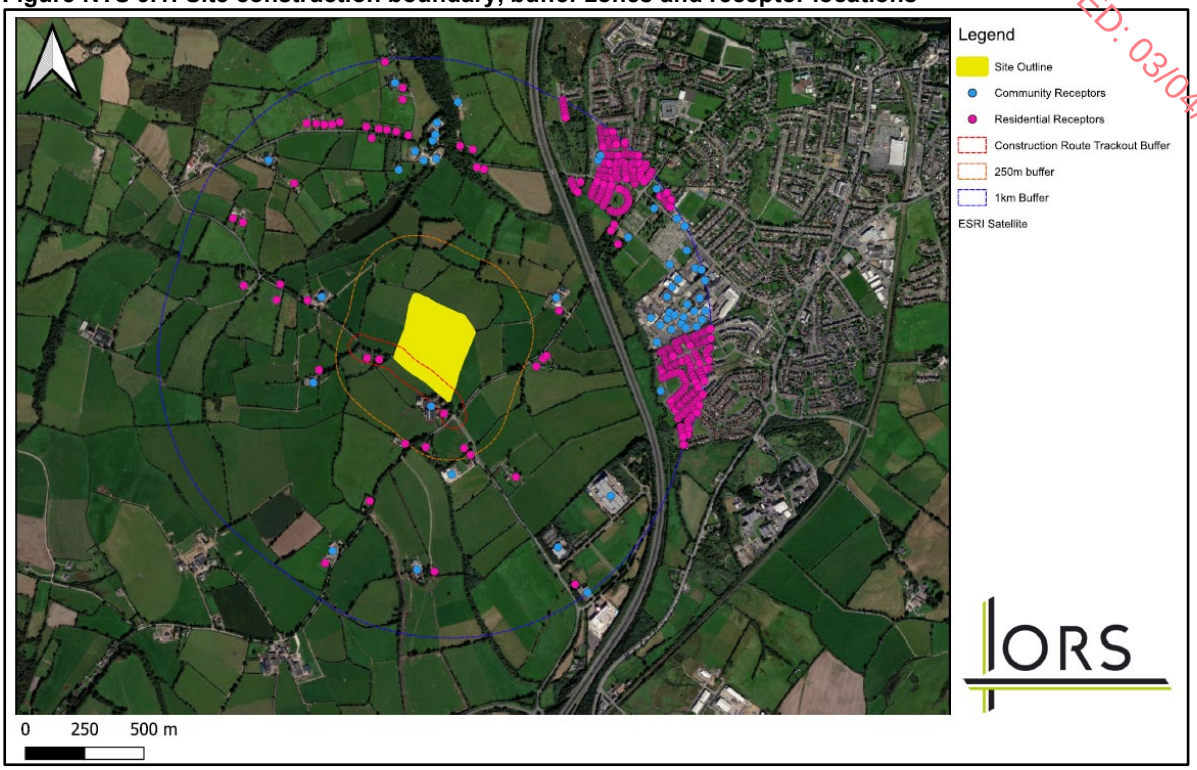
There are approximately 7 sensitive receptors within 250 meters of the site boundary and 4 within 50 metres of the applicable construction routes.

Human receptors are largely residential houses located to the Southwest and west of the site. There is a farmyard *ca.* 67m South of the site boundary.

The nearest human and residential receptor to the site is a residential house located approximately 58m South of the proposed site boundary. Dust will be created during the construction of the Proposed Development which may have adverse effects on local sensitive receptors e.g., residents living nearby.

The construction dust assessment study area including identified receptors is included as part of **Figure NTS 9.1.**

Figure NTS 9.1: Site construction boundary, buffer zones and receptor locations



Air Quality

Air quality monitoring programs are routinely undertaken by the EPA and Local Authorities. The most recent annual report on air quality "Air Quality in Ireland Report 2023" (EPA 2024), details the range and scope of monitoring undertaken throughout Ireland. As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes.
Onsite monitoring (and subsequent lab analysis as necessary) was carried out for the below parameters to evaluate background levels for the site. To remain as conservative and robust as possible figures obtained from EPA monitoring were utilised, as per AG4, which are greater than results obtained from the onsite monitoring. Onsite results for NH_3 and H_2S were utilised in the absence of data generated from EPA monitoring locations. Data from the Portlaoise monitoring station was utilised for the Carbon Monoxide values and data from the Enniscorthy monitoring station was utilised for the $PM_{10/2.5}$ values. Fieldwork was completed October 2024 and consisted of the following elements;

- $PM_{2.5}$ and PM_{10} Monitoring (EPA Monitoring Station)
- NO, NO_2 and NOx Monitoring
- SO_2 Monitoring
- H_2S Monitoring
- NH_3 Monitoring
- CO Monitoring (EPA Monitoring Station)

Results can be seen below in **Table NTS 9.1**.

Table NTS 9.1: Baseline Air Quality Monitoring Data in the Vicinity of Proposed Plant

Compound	Site specific baseline monitoring 3rd October to 30th October 24
Carbon Monoxide 8hr (Annual Mean) (1 Location)	Avg 0.08
Oxides of Nitrogen (Annual Mean) (4 locations)	Avg. 10.70 (Min 10.60 - Max 10.90)
Sulphur Dioxide (Annual Mean) (4 locations)	Avg. <1.58 (Min <1.58 - Max <1.58)
Particulate matter as PM10 (Annual Mean) (1 Location)	Avg. 12.55 (Min 1.75 - Max 96.69)
Particulate matter as PM2.5 (Annual Mean) (1 Location)	Avg. 8.01 (Min 0.75 - Max 89.25)
Ammonia (Annual Mean) (4 locations)	Avg 5.05 (Min 2.45 - Max 9.48)
Hydrogen Sulphide (Annual Mean) (4 locations)	Avg 0.16 (Min <0.10 - Max 0.32)

In summary, existing baseline levels of the pollutants based on extensive long-term data from the EPA and field monitoring locations are below ambient air quality limit values in the vicinity of the proposed development. This indicates there is a relatively good level of air quality in the area of the proposed development.

9.2 Effects of the Proposed Development

Operational Effects

Process Emissions

AERMOD has been utilised to evaluate the air quality impact from the planned odour abatement emission source and also the from the two combustion sources positioned onsite i.e. the CHP and biomethane boiler.

There is also the possibility of emissions to air being generated from the planned gas upgrading plant, planned pressure relief valves, digestor vents at the site, however, due to the nature and / or the infrequent use of these emission sources air dispersion modelling was not required to evaluate the possible impact from these sources. Digestor membrane vents contain air only and are used to control the pressure within the gas dome. There is no release of biogas through the digestor air vents. Pressure relief valves (PRV) are not intended for routine use onsite. The PRVs are only used in the unlikely event of all other gas outlets being simultaneously out of service. The Biogas Upgrading Unit, CO_2 Liqueufactor and Grid Injection Unit (GIU) have been scoped out of the air dispersion modelling as they are designed to be gas tight with no risk of emissions.

The biogas flare will have a capacity of 110% of the estimated maximum hourly biogas produced and will safeguard the secure and complete combustion of biogas where necessary. The usage of this emergency flare is envisaged to be infrequent and would operate only in the unlikely event that both CHP and gas upgrader are not operational. Planned preventative maintenance will ensure that these two units are staggered in maintenance downtime, backup power supplies will be installed on site to mitigate for a power cut i.e. an event that could affect both units simultaneously

AERMOD results give rise to the following conclusions:

Table NTS 9.2 below compares the highest annual average predicted levels at the residential receptors where:

- The Process contribution (PC)- the maximum modelled concentration of the substance due to process emissions alone
- Predicted Environmental Concentration (PEC) – that is, the maximum modelled concentration due to process emissions combined with estimated baseline concentrations.
- PC and PEC as a percentage of the objective or guideline.

In relation to the predicted short-term peak 1-hr concentrations, twice the background concentration level was added to the predicted environmental concentration (PEC) (UK Environment Agency).

Table NTS 9.2: Air Quality Summary

Pollutant	Limit Type	Value ($\mu g/m^3$)	Baseline ($\mu g/m^3$)	Max Level ($\mu g/m^3$)	PEC ($\mu g/m^3$)	PC of limit (%)	PEC of Limit (%)
Nitrogen Dioxide (NO_2)	99.8% max 1-hr	200	14.6	7.8	22.4	3.9	11.2
	Annual Avg	40	7.3	1.02	8.3	2.5	20.8
Carbon Monoxide (CO)	8-hr mean	10,000	0.3	59.3	59.6	0.6	0.6
Odour	98th %tile of 1-Hour	3	0	1.45	1.45	48.4	48.4
Ammonia	Max 1-Hour	2,500	3.78	3.60	7.38	0.1	0.3
	Annual Average	180	1.89	0.04	1.93	0.0	1.1

**The maximum annual average levels for Nitrogen Dioxide and Carbon Monoxide are predicted when the volume flow from the proposed facility is at 75%, rather than a maximum. Full details of the assessment undertaken at 75% volume flow are included in Appendix 9.5.*

It can be seen that the worst case predicted level at any residential locations in the vicinity of the development do not exceed the limit level when considered as a PC or PEC.

It should also be noted that the PC under maximum operations does not exceed 75% of the ambient air quality standards, based on the maximum emission limits of the stacks.

Nitrogen Deposition

A review has been completed with regard to emissions from the proposed development on critical levels and loads for designated sites within 15 km of site. The PC at all locations is less than 0.3kg.N/ha/yr, and as a result would be considered negligible for the purposes of the Nitrogen assessment.

In addition, it can be seen that the maximum predicted Nitrogen deposition is significantly <1% at all of the locations assessed, and the Critical Level of Nitrogen is not exceeded at any location.

Traffic

LA105 DMRB guidance gives details for assessing significance of air quality effects of a development in relation to nitrogen dioxide (NO_2) and particulate matter (PM_{10}). **Table NTS 9.3** below describes the corresponding terms used to describe the level of significance from the DMRB in conjunction with EPA EIAR guidance.

Table NTS 9.3 Traffic air quality effects (Operational Stage)

Magnitude of change in annual mean NO_2 or PM_{10} ($\mu g/m^3$)	Magnitude (DMRB)	Significance (EPA)
>4 (>10%)	Large	Significant, Very Significant, Profound
>2 (>5%)	Medium	Moderate
>0.4 (>1%)	Small	Slight
<0.4 (<1%)	Negligible	Not significant, Imperceptible

Traffic input data is included in **Appendix 9.3**. The DMRB Screening Method spreadsheet was used to forecast pollution concentrations at a receptor position. A robust and conservative approach was utilized when assuming background concentrations (i.e. 1.63 µg/m3 for NO2 and 18.27 µg/m3 for PM10 – average values taken from EPA Monitoring locations). **Table NTS 9.4** (shown below) shows the results of "Do Minimum" (DM) and "Do Something" scenarios for 2025 assuming (as a worst-case scenario), receptors are 3m away from road links.

Table NTS 9.4: Projected NO_2 and PM_{10} traffic concentrations for "Do-minimum (DM)" and "Do-something (DS)" scenarios

Receptor	NO_2				PM_{10}			
	DM (µg/m3)	DS (µg/m3)	Change (µg/m3)	Magnitude	DM (µg/m3)	DS (µg/m3)	Change (µg/m3)	Magnitude
R1	12.8	12.9	0.1	Negligible	10.20	10.21	0.01	Negligible

Climate

The generation of *ca.* 810-960 Nm^3 of biomethane per hour which will be distributed to the gas network for use as an alternative to conventional fossil fuels. The outcome of the Proposed Development once in operation will be a slight, positive, long-term effect on climate and regional air quality. Therefore, the Proposed Development will have a slight positive impact on reducing agricultural greenhouse gas emissions in County Wicklow and national greenhouse gas emissions in accordance with the Climate Action Plan (Government of Ireland, 2024).

Construction Effects

Dust

Construction dust usually deposits within 200m of a construction area; however, the bulk of this deposition will occur within the first 50m. There are no sensitive receptors (residential receptors) within 50m of the site. Therefore, the surrounding area can be classified as low risk with respect to construction dust effect in this regard. Emission effects from planned construction are finite and short-term, mitigation measures (outlined in **Section 9.6 – EIAR Main Report**) will also be in place through this stage, leading to air quality effects that will

temporary, negligible and short-range.

Traffic / Emissions

Construction traffic and embodied energy of construction materials are likely to be a possible cause of gas emissions because of construction related to the Proposed Development. Construction plant and machinery will lead to generation of CO_2 (a greenhouse gas) and NO_2 (an air pollutant) during construction of the Proposed Development. Due to the period, nature and scale of construction, emissions from construction plant, machinery and embodied energy of construction resources will have a short-term and imperceptible impact on climate and environment.

9.3 Mitigation Measures

Construction Phase

Dust

The constant control of fugitive dust will maintain the prevention of significant emissions, The constant control of fugitive dust will maintain the prevention of significant emissions, instead of an inefficient attempt to manage them once they have been released. The main elements with respect to control of dust will be:

- The design of a site policy on dust and the allocation of the site management responsibilities for dust management.
- The creation of a documented system for managing site practices regarding dust control.
- The development of a method by which the functionality of the dust control plan can be consistently monitored and assessed; and
- The requirement of effective procedures to handle any complaints.

These procedures will be strictly monitored and assessed continuously throughout the construction stage. In the occurrence of dust nuisance outside the site boundary, activities likely to cause dust would be restricted and adequate procedures applied to resolve the problem before the recommencement of construction operations.

Traffic

Traffic emissions associated with site have been projected as not significant therefore no detailed mitigation/remediation related to air and climate emissions from traffic have been described.

Climate and regional air quality

Various site-specific mitigation methods can be applied throughout the construction stage of the Proposed Development to support emissions reduction. The restriction of on-site or delivery vehicles from leaving engines idling, even over brief periods. Reducing waste of materials due to inadequate timing or over stocking of materials on site will assist to minimise the carbon footprint of the site.

Operational Phase

Odour

The following odour abatement measures have been integrated into the design of the plant:

- The reception hall has been constructed to accommodate multiple trucks to unload at any one time. This will significantly reduce the number of trucks waiting outside of the building and therefore minimising fugitive odour emissions on-site.
- The proposed reception hall will be sealed to prevent fugitive emissions from this building.
- All waste activities at the facility will be carried out within a ventilated building which will be extracted to an odour abatement system using ammonia scrubbing, UV treatment and active carbon filtration to remove odorous compounds. The building will operate under negative pressure with a minimum of 2 air changes per hour. Ventilation pipe work installed in the headspace of the building will be connected to a high-volume medium-pressure blower that will draw off the warm, buoyant building air that will be generated by a combination of emissions from the feedstock materials in the intake area and from fugitive emissions from the movement of the material to the pre-treatment and digesters.
- The main entrances to the reception building will be fitted with rapid response roller shutter doors. A closed-door management strategy will be enforced.
- Treated emissions from the odour control plant in the reception building will be discharged via a 6.0m stack to enhance dispersion. The proposed location of the odour abatement system emission point within the site footprint was also designed to ensure that the distance between the emission point and the nearest sensitive receptors was maximised, thereby aiding dispersion.

The following additional mitigation measures will be adopted for the management of the Proposed Development:

- Vehicles exiting the reception building will be subjected to cleaning procedures in accordance with the DAFM Conditions Document in a designated cleaning area located inside of the building door.
- All feedstock will be delivered in covered or sealed containers and offloaded inside reception building where odour abatement system is operational.
- Feedstock delivery times will be controlled in order to minimise truck waiting times outside of the reception building and therefore minimising fugitive odour emissions on-site.
- Biobased fertiliser will be stabilised and pasteurised before storage and removal from the site in order to minimise odour generation.
- An odour management plan will be prepared for the operational phase of the site to ensure that all odour control methods applied are sufficient and assessed at regular intervals. The plan will also outline a procedure for addressing any odour complaints.

As described previously, the Proposed Development will be licenced by the EPA under the Industrial Emissions Directive and will therefore need to comply with all associated processes and conditions as directed by the IE licence to avoid significant impacts to local odour, climate and air quality.

Process Emissions

The proposed stack height for the CHP has been designed in an adaptive manner to guarantee that an acceptable height has been incorporated into site layout to support effective dispersion of emissions and comply with applicable EU ambient air quality standards at all offsite locations.

As a result of the air dispersion modelling evaluation, mitigation measures designed into site

and planned supervision of the proposed AD facility (as described within this chapter and in Chapter 2), no supplementary abatement measures are planned for the CHP, flare and biomethane boiler stack during the operational stage of the development.

9.4 Cumulative Effects

Construction Phase

There is potential for cumulative dust effects at adjacent site receptors should the construction stage of the planned development overlap with the construction of any other authorised development within 250m of the site. Dust alleviation measures described in **Section 9.6.1** shall be employed during the construction stage of the planned development preventing significant cumulative effects on air quality. Due to suitable mitigation measures in position, any cumulative impacts on air quality and climate linked with the construction stage of the planned development are considered ***short-term and not significant.***

Operational Phase

There is a farm in the immediate vicinity of the site, however cumulative impacts are unlikely, in terms of odour or air quality. Feedstock from the farm will be transported directly to the Proposed Development. Any existing sources of emissions to air have been included by way of background air quality data during the air dispersion modelling phase.

Indirect Impacts

Ammonia emissions to air occur from slurry and chicken manure spreading. Ammonia can create particulate matter in the atmosphere which can have adverse effects on human health.

Ammonia is one of the key air pollutants monitored and reported under National Emissions Ceiling Directive (2016/2284/EU) which was ratified to give effect to the landmark UNECE Gothenburg Protocol under the Convention on Long Range Transboundary Air Pollution in 1999. Under this directive Ireland's ceiling for ammonia is 116 Kt per annum, with an obligation to decrease ammonia emissions to 107.5 Kt by 2030 or by *ca.* 10%. In 2017 Ireland infringed its ammonia ceiling emitting 11 8.4 KT of ammonia.

Using slurry/chicken manure as a feedstock for the AD process instead of land spreading will reduce ammonia emissions to air. Also, the use of digestate as a biobased fertiliser instead of inorganic nitrogen fertiliser will further reduce ammonia emissions.

The digestate produced will meet prescribed standards for respiration activity, metals, pathogenic organisms, impurities, organic matter and maturity. Digestate storage tanks will be covered to prevent rainwater ingress and vented via the ventilation and odour abatement system, thus capturing any potential odours should they occur. As the digestate storage tanks will not be heated and the contents will have undergone pasteurisation, the biological activity will be very low. The digested organic material itself, due to the long retention time in the digesters, will have been decomposed to its smaller constituents and thus potential for ongoing odours is greatly reduced.

Therefore, the Proposed Development will have a long-term slight positive indirect effect on air quality.

9.5 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 which can be taken to reduce or offset the scale, significance and duration of the impacts on the surrounding odour, air quality or climate.

The purpose of this assessment is to specify mitigation measures where appropriate to minimise the 'risk factor' to all aspects of air quality such as to minimize the potential for odours to be generated, air quality limits to be exceeded etc. This 'risk factor' is reduced or offset by recommending the implementation of a mitigation strategy in each area of the study. On the implementation of this mitigation strategy, the potential for impact will be lessened.

A site-specific Construction Environmental Management Plan (CEMP) will be devised and implemented throughout the duration of the construction phase. This document will contain all the necessary procedures required to prevent and minimise any environmental risks posed by the project on the surrounding environment.

Construction Phase

A summary of the predicted impacts associated with the construction phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual impacts are summarised in **Table 9.32 (EIAR Main Report)**.

The overall impact anticipated by the construction phase of the project following the implementation of suitable mitigation measures is considered to be ***negative, imperceptible to moderate, and temporary.***

Operational Phase

A summary of the predicted impacts associated with the operational phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual impacts are summarised in **Table 9.33 (EIAR Main Report)**.

The overall impact anticipated by the operational phase of the project following the implementation of suitable mitigation measures is considered to be ***neutral to negative, imperceptible to slight, and temporary to long term.***

10 Noise and Vibration

Enfonic Ltd. have been commissioned by ORS Consulting Engineers to conduct a noise impact assessment in relation to the proposed Anaerobic Digestion Facility at Moneylane, Arklow, Co. Wicklow (the Proposed Development).

The methodology adopted for this noise impact assessment is summarised as follows:

- Review of appropriate guidance to identify appropriate noise and vibration criteria for the construction, operational and decommissioning phases;
- Quantify the receiving environment through baseline noise surveys at representative Noise Sensitive Locations (NSLs) surrounding the Proposed Development;
- Undertake predictive calculations to assess the potential effects associated with the construction phase of the Proposed Development;
- Undertake predictive calculations to assess the potential effects associated with the operational phase of the Proposed Development;
- Evaluate the potential noise and vibration effects;
- Specify mitigation measures to reduce, where necessary, the identified potential outward effects relating to noise and vibration from the Proposed Development; and
- Describe the significance of the residual noise and vibration effects associated with the Proposed Development.
- In addition, the following guidelines were considered and consulted for the purposes of this chapter:
- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022); and
- EPA Advice Notes on Current Practice (in the preparation of Environmental Impact Statements), (2003).

10.1 Receiving Environment

Noise Sensitive Locations

A Noise Sensitive Location (NSL) is defied in EPA NG4 as:

"*any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels*."

The study area is defined as any NSL that may be affected by noise from the Proposed Development. A representative sample of the closest NSLs is used in this assessment. Noise levels diminish over distance therefore these locations represent a worse-case evaluation.

Noise levels to the nearest NSLs as a result of operation of the Proposed Development are considered in this assessment with a commensurate reduction in levels at locations further away. The locations assessed are given in **Figure NTS 10.1** below:

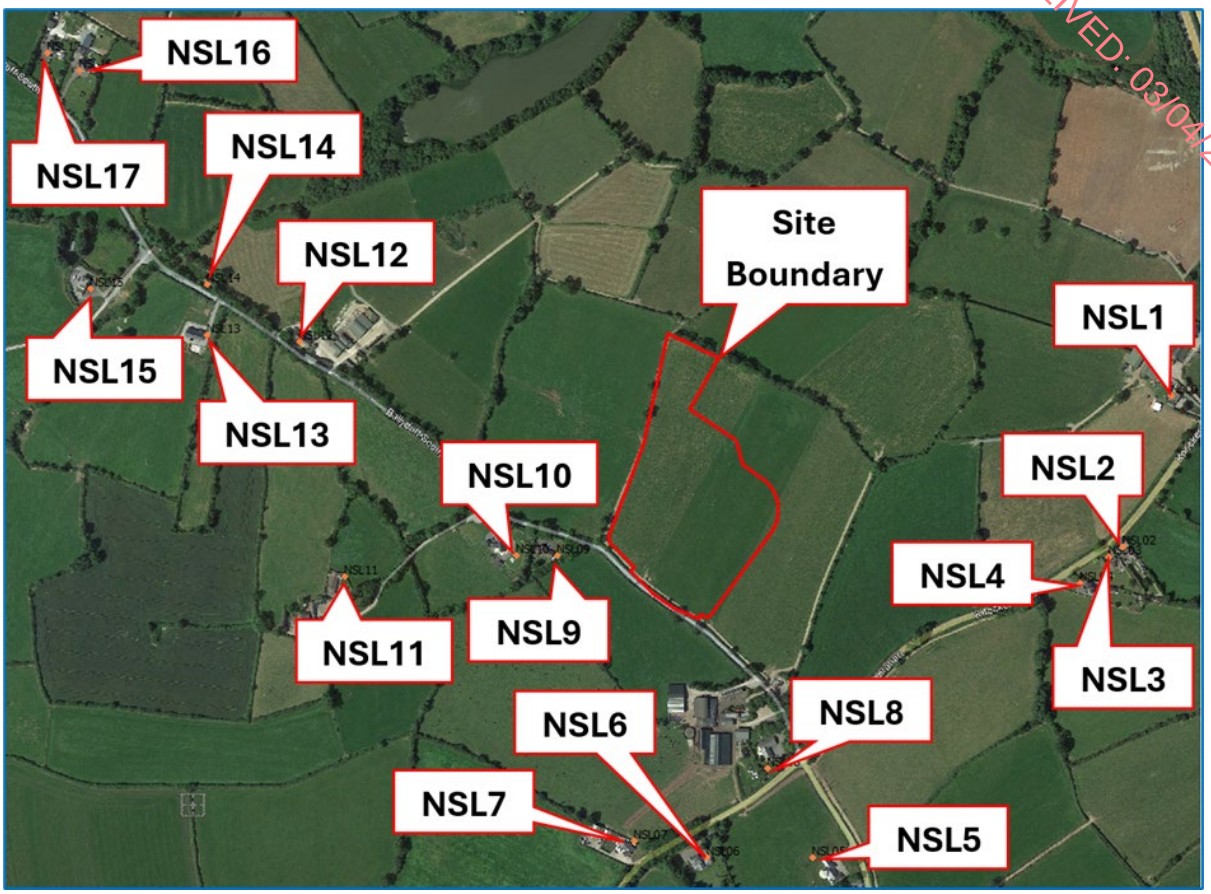


Figure NTS 10.2: Study Area and Noise Sensitive Locations (NSL)

Background Noise Survey

A noise survey has been conducted at the site in order to quantify the baseline noise levels within the study area. The survey was conducted in general accordance with *ISO 1996: 2017: Acoustics - Description, Measurement and Assessment of Environmental Noise* and followed the methodology contained in EPA NG4. Specific details are set out below.

Noise Monitoring Locations

Three Noise Measurement Locations (NMLs) were selected to represent the ambient noise conditions at the identified Noise Sensitive Locations.

Attended measurements took place on 13-11-2024 and 05-02-2025 and unattended noise monitoring took place between 07-11-2024 and 15-11-2024.

Attended noise measurements were taken at ASL1 and ASL2 to establish the daytime noise levels. Unattended noise monitoring at NML over several days was used to establish the night-time noise levels. The locations are as shown in **Figure NTS 10.2** below:

Figure NTS 10.2: Map of noise monitoring locations (NMLs) and site boundary

Survey Results

Noise measurements were taken using class 1 Bruel & Kjaer Type 2250 Sound Level Meters (SLMs). Each meter was calibrated prior to measurements and the sensitivity checked afterwards for any significant drift; none was found. Weather conditions were calm and dry throughout the survey.

Day-time Levels

Measurements were taken at each of the two attended locations and the average of the results are used to set the prevailing Background (LA90). The results are presented in **Table 10.6 (EIAR Main Report)**

The average typical Daytime Background (LA90) noise level was 45dB (rounded).

Night-time Levels

Night-time noise levels were derived from the unattended noise monitor and the typical Background (LA90) noise level was 32dB (rounded).

a time-history plot of the average Night-time noise levels from here is given in **Appendix C** (**EIAR Main Report**).

10.2 Assessment of Impacts

In general, noise impact is a result of the noise levels of the sources, the distance from the source to a receiver, the intervening topography and built environment, the time of day and the existing background noise levels.

The impact assessment considers the construction and operational phases separately.

Do-Nothing Scenario

If the development is not progressed the existing noise environment (as measured in the baseline assessment) in the vicinity of the Proposed Development will remain largely unchanged. Traffic flows on the road network in the area are expected to grow over time with an associated increase in noise level.

Construction Phase

The appropriate methodology for the impact assessment of the construction phase is set out in *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1 Noise*. The standard sets out sound power levels and L_{Aeq} noise levels of plant items normally encountered on construction sites, which in turn enables the prediction of noise levels at selected locations.

An outline CEMP has been submitted in relation to the Proposed Development and will be updated when a definitive construction plan is formalised, to include mitigation outlined in this chapter. As a working initial hypothesis, the impact of assumed typical construction phases of work has been assessed.

Following a review of the baseline noise survey results (**Table 10.3 – EIAR main report**), the appropriate BS5228 construction noise category is A i.e. 65dB L_{Aeq}.

The impact assessment considered the impact of the following potential noise sources from construction phase works at the development:

- Construction Noise
- Construction Traffic
- Construction Vibration
- Extension of the Gas Network Pipeline

Description of Effects

With respect to the EPA's criteria for description of effects, the potential worst-case effects at the nearest NSLs associated with the above aspects of the construction phase are described **Table NTS 10.1** below:

Table NTS 10.1: Summary of Description of Effects (Construction Phase - Unmitigated).

Aspect	Quality	Significance	Duration
Construction Phase	Negative	Slight	Temporary
Construction Traffic	Negative	Not Significant	Temporary
Gas Pipe Extension Works	Negative	Significant	Temporary

Operational Phase

Anaerobic digestion is a continuous process and therefore the digestion and gas upgrade and injection processes will operate continuously.

Feedstock deliveries and the removal of digestate will only occur from 08:00 to 18:30 hrs

Monday to Friday and from 09:00 to 13:00 hrs on Saturday.

The most stringent noise impact assessment is for the Night-time period due to the lower measured Background (LA90) noise levels compared with the Daytime period.

Each of the potential operational noise sources were identified and reference sound power data assigned. The data has been sourced from manufacturers datasheets, noise source databases, and BS 5228-1:2009+A1:2014 standard.

The associated noise sources with the Proposed Development are described in **Table 10.12** (**EIAR main report**).

Noise sources that are contained within buildings are estimated to have negligible significance due to the attenuation of the building fabric. The Flare Stack and associated Biogas Blower operate only in an emergency or for testing purposes. It is therefore appropriate not to include these sources in the noise impact assessment.

A computer-based noise propagation model has been prepared to predict the noise levels. **Section 10.6.12** (**EIAR Chapter 10 – main report**) discusses the methodology behind the noise modelling process and presents the results.

The assessment criteria can be summarised as follows:

BS4142 (Daytime)

There is likely to be no adverse impact during the Daytime period as the predicted levels are below the existing Background (LA90) noise levels at all NSLs with the exception of NSL08, where a slight impact is indicated under the worst case scenario. Here, the predicted noise levels are primarily influenced by delivery vehicles. The location is also closest to the roads and therefore the nature of the ambient noise environment will not alter as a result of the Proposed Development.

BS4142 (Night-time)

There is likely to be no adverse impact during the Night-time period as the predicted levels are below the existing Background (LA90) noise levels at the majority of NSLs and marginally above at some. The maximum exceedance is 2dB which is considered negligible and imperceptible.

EPA IE License

Operation noise emission levels will satisfy the criteria as set out in the Environmental Protection Agency (EPA) (2016) *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities* (NG4) which should be referenced in the site's IE license.

Description of Effects

With respect to the EPA's criteria for description of effects, the potential worst-case effects at the nearest NSLs associated with the proposed development are described in **Table NTS 10.2** below:

Table NTS 10.2: Summary of Description of Effects (Operational Phase - Unmitigated)

Aspect	Quality	Significance	Duration
Daytime Period	**Negative**	**Imperceptible to Slight[1]**	**Long-term**
Night-time Period	**Negative**	**Imperceptible**	**Long-term**
[1]At 1no. location			

10.3 Mitigation Measures

Construction Phase

The Construction Environmental Management Plan (CEMP) will deal specifically with management processes and strategic mitigation measures to remove or reduce significant noise and vibration impacts, and cumulative noise and vibration impacts from the construction works. The Plan will also define noise and vibration monitoring and reporting. The CEMP will also include method statements for each phase of the works, the associated specific measures to minimise noise and vibration in so far as is reasonably practicable for the specific works covered by each plan and a detailed appraisal of the resultant construction noise and vibration generated.

The contract documents shall specify that the Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures when deemed necessary to comply with the recommendations of *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction on open sites - Noise.* The following list of measures will be implemented, where necessary, to ensure compliance with the relevant construction noise criteria:

- No plant used on site will be permitted to cause an on-going public nuisance due to noise.
- The best means practicable, including proper maintenance of plant, 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.
- Any plant, such as generators or pumps, which is required to operate before 07:00hrs or after 19:00hrs will be surrounded by an acoustic enclosure or portable screen.
- During the construction programme, supervision of the works will be include ensuring compliance with the limits detailed in Section 6.2.1 using methods outlined in BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Noise.

The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 07:00hrs and 19:00hrs weekdays and between 08:00hrs and 16:00hrs on Saturdays. However, any necessary or emergency out of hours working will be agreed in advance with the local Planning Authority.

Operational Phase

The impact assessment herein adopts a worst-case with all noise sources associated with the site operating simultaneously and continuously. In reality the noise levels and the impact will be less.

Noise emissions associated with deliveries will be subject to operational restrictions including timings to minimise any adverse impacts.

There is no further mitigation measures required to minimise the impact of the operational phase with the exception of regular maintenance of the plant and suitable assessment of any replacement plant that may be required in the future.

Decommissioning Phase

It is anticipated that the decommissioning phase will adopt a similar approach to the construction phase of this assessment including the same noise criteria. To minimise the potential impact on noise sensitive locations, mitigation measures in line with those proposed for the construction phase are proposed.

Monitoring

Noise and vibration emissions may be monitored by the planning and/or licensing authority as required to ensure compliance with conditions and in the event of complaint.

10.4 Residual Impacts

Construction Phase

The assessment identified that there is potential for elevated noise levels during the construction phase and mitigation measures are prescribed as applicable. However, given the nature of the work there may be occasions where there are residual effects. It is therefore considered that the residual impact will be ***slight*** and for a ***brief*** period.

Operational Phase

During the operational phase, the Night-time predicted noise levels may be above the existing baseline noise levels at the limited number of Noise Sensitive Locations close to the facility. Mitigation measures are prescribed as applicable. A new noise source will be introduced into the environment, however the noise levels for the vast majority of NSLs are ***insignificant***.

11 Landscape and Visual

The landscape and visual impact assessment (LVIA), concerns itself with landscape, landscape values, aesthetic and visual amenity and landscape as a resource which provides society with cultural, economic, and environmental benefits. Landscape has come to be defined according to the European Landscape Convention as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'.

The assessment is informed by EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022 and the methodology prescribed in the Guidelines for Landscape and Visual Impact Assessment, 3rd edition, 2013 (GLVIA) published by the UK Landscape Institute and the Institute for Environmental Management and Assessment.

Although interlinked, the Landscape Impact and the Visual Impacts are assessed separately and with their own sets of criteria.

Landscape

The effects on landscape are studied with Landscape Character Assessment (LCA) as the guiding principle. This is concerned with the identification of and assessment of the importance of landscape characteristics, landscape quality and the condition of the landscape.

The impact of the development itself is studied as the impact of the proposals and development on the landscape, whilst 'effect' describes the changes brought about by these impacts e.g., a change to landscape character.

Visual

Visual assessment is concerned with changes that arise in the composition of available views, the response of people to these changes and the overall effects on the area's visual amenity.

Methodology for Landscape Assessment

The baseline descriptions are required to consider the context of the landscape and views in terms of the proposed location, magnitude and spatial extent of landscape affected as well as current trends in that landscape/view.

The methodology for conducting a Landscape and Visual Impact Assessment (LVIA) is a structured approach designed to evaluate the potential effects of a proposed development on the landscape and visual environment. This comprehensive process involves several key stages, which are outlined below:

- Baseline Information
- Thresholds of Magnitude of Change
- Landscape Quality
- Value
- Landscape Sensitivity
- Geographical Extent
- Loss/No Loss of Landscape Elements
- Magnitude of Landscape Change
- Probability of Effects

- Significance of Effects
- Duration of Effects
- Environmental Protection Agency Guidelines
- Methodology for Visual Effects Assessment:
    - Susceptibility of the Visual Receptor to Change
    - Value attached to the view
    - Categories of Viewpoint Sensitivity
- Magnitude of Change to the View
- Significance of Visual Effects
- Mitigation Measures

11.1 Baseline Conditions

The following headings in relation to Landscape and Visual baseline conditions were assessed:

- Ordnance Survey Ireland Historical Maps
- Landscape Associations
- Wicklow County Development Plan LCA
- Landscape Character Assessment Policy Objectives
- General Landscape Policies and Objectives MCDP
- Landscape Value
- Geological Heritage
- Landscape Character Type
- Recreation and Tourism

The following baseline conditions are deemed to be of notable value to the assessment:

- The landscape has not generally changed significantly. The change in field size has had the most effect on landscape pattern. The fields have been enlarged but not as dramatically as has been the case in other parts of the country.
- The Wicklow County Development Plan 2022-2028 categorises the landscape into a hierarchy of six landscape categories and within those, fifteen Landscape Character Areas in the County. This landscape character assessment was subsumed from the 2016 assessment into the current County Development Plan.
- Whilst the sensitivity for the LCA has been assessed as low, the value for this landscape when assessed at a local level is **low** to **medium**.
- The following policies and objectives of the WCDP are relevant for the Proposed Development: **Landscape Views and Prospects Policy & Objectives CPO 17.35, CPO 17.36, CPO, 17.37, CPO 17.38, CPO 17.16, CPO 17.17, CPO 17.18, CPO 17.19, CPO 17.20, CPO 17.21, CPO 17.22, CPO 17.23**.
- None of the protected views and prospects will be affected by the Proposed Development.
- There are no sites of geological importance relating to the site of the Proposed Development.
- There are no (SPA,SAC,NHA or pNHA) within the boundaries or close to the Proposed Development.
- The landscape proposals for this Proposed Development (as submitted in the accompanying landscape masterplan) recommend increased planting of new hedgerows and replacement of new hedgerow back from the proposed sight lines

where a new entrance punctures the site entrance. The original Moneylane townland boundary will not be affected by the Proposed Development.
- The scenic viewpoints as listed in the WCDP were examined in relation to the Proposed Development. There are no listed views in the proximity of or focused on the Proposed Development.
- None of the listed Natura sites (National Parks and Wildlife Service designations) are within the site of the Proposed Development. All the designated areas are at some distance from the Proposed Development and due to distance, intervisibility is also not a concern for these proposals.
- There are no recorded monuments or protected structures in the townland or near the site of the Proposed Development.
- Topography ensures there is good capacity for the area to ensure enclosure will absorb the Potential Development. The generous stands of hedgerows and hedgerow trees in the area means there is good capacity to screen development and allow it to be absorbed into the wider landscape.

Landscape Effects

The sensitivity of the Eastern Corridor LCA lies within a '**low'** sensitivity landscape**.** However, locally, there are many valuable landscape elements near the site of the Proposed Development. Considering the nature of the Proposed Development, the intrinsic and inherent values attributed to the landscape character area and assessing the landscape at and near the site of the Proposed Development the rating '**low to medium'** is more appropriate for landscape sensitivity.

The elements which contribute to positive landscape character at or near the site of the Proposed Development are the shape and orientation of the field system, the hedgerows and the particular presentation of hedgerow trees in this area. There are several mature oak trees with their understory of holly quite intact in the hedgerow network. There are also Scots Pine and beech visible locally in the hedgerow. The bank and drain system of hedgerow construction is peculiar in this instance due to the prominence of the hedgerow bank which is particularly pronounced when associated with damper ground or level changes. Stone is apparent in some though not all the bank construction.

The proximity of the site to the town of Arklow with large industrial units and warehouses in the landscape character area, results in elements which contribute less positively to landscape character. The large industrial structures visible in the local IDA Business Park at nearby Ballynattin, like the ARC Building Products structure add incongruity at the landscape character level.

View Effects

The scenic viewpoints as listed in the WCDP were examined in relation to the Proposed Development. There are no listed views in the proximity of or focused on the Proposed Development.

A comprehensive assessment was made of potential viewpoints. These were then distilled down to a set of viewpoints which are the subject of the verified photomontage study. The accompanying verified view photomontage is to be read in conjunction with this report (**Chapter 11 - EIAR Main Report**). In making these assessments, topography, site location, hedgerows systems, woodlands, and residences were considered as well as designated

sensitivities and landscape as a resource for visual amenity, recreation, culture, and tourism.

11.2 Predicted Impacts

Landscape Construction Phase

The changes to the landscape will occur during the construction stage. The proposal will require an entrance creating an opening in the existing hedgerow line and facilitate sight lines, however there will be no other loss of landscape elements that would alter the landscape character at a local level. There will be a new scale introduced into the landscape. The landscape exhibits a reasonable capacity for change when accompanied with tree planting. Woodland and trees are an addition to the existing landscape which even in modest quantities add to the overall landscape pattern of woodland, forestry, trees and a mosaic of fields.

Landscape Sensitivity: **Low to Medium**

The overall Magnitude of Change will be '**medium**'.

Setting a **medium** magnitude of change against **low to medium** landscape sensitivity gives a significance of effects at the construction phase of the proposed development that is categorised as '**Moderate**' for medium sensitivity and 'Slight' for low sensitivity.

Landscape Operational Phase

There will be no change to the landscape form or structures placed therein from the construction phase as the facility becomes operational. There is expected increase in traffic at the facility. As part of the landscape proposals, it is recommended that there will be a significant mixed screen planting wrapped around the proposed facility. This will largely include native and naturalised trees and plant material.

This will screen the scale and form of the structures and add additional deciduous trees and Scots Pine to the overall landscape which blends with the landscape character area. Trees will add another favourable element to the landscape in the long run.

During the operational phase of the development, maturing trees present an opportunity to make a positive contribution to the overall landscape. The landscape sensitivity is not likely to change from the construction phase, but the magnitude of change will be lower as the landscape proposals start to establish and grow. In the medium term, the positive landscape impact of the trees and understory development will reduce the magnitude of change experienced at landscape level from medium to low.

Landscape Sensitivity: **Medium to Low**

Magnitude of Change: **Low**

Setting a medium to low landscape sensitivity against a **low** magnitude of change gives a '**slight**' rating for medium landscape sensitivity and a '**not significant**' rating for significance of effects at the operational phase of the proposed facility. Given the scale of the development, a significance of effects rating of '**slight**' is appropriate.

Significance of effects: **Slight**

The likely effect will be adverse and long term, but the tree planting and general landscape proposals will be positive and the benefits to the landscape will be permanent with many of the species listed in the planting schedule capable of living for more than 100 years.

Visual Assessment

In conducting the visual assessment for the Proposed Development, issues relating to views and viewpoints were considered including the amount of time over which a view would be experienced, the angle of the view and whether views would be full, partial, or glimpsed. The distance from the Proposed Development was considered and the extent of the area over which the proposed works would be visible. Initially a zone of theoretical visibility (**Appendix 2 – Chapter 11 EIAR Main Report**) influenced the areas being considered for intervisibility. A ZTV is computer generated and presents the worst-case scenario and examines intervisibility without the effect of natural land cover, forests, woodlands, trees, buildings and vegetation. The area was visited and the most likely visual receptors identified. Again, as for the landscape effect, the duration of the visual impact was considered. The duration of the visual effects is considered as appropriate. As per EPA guidelines, duration of effects is categorised as follows.

Short-term Effects: Effects lasting one to seven years

Medium-term Effects: Effects lasting seven to fifteen years

Long-term Effects: Effects lasting fifteen to sixty years

Permanent Effects: Effects lasting over sixty years

Visual Impact – Construction Phase

The area around Moneylane was visited on 15th October 2024 and again on 10th November for assessment and viewpoint appraisal. The area was visited on 25th October 2024 for photography for verified photomontage production. The visual impact assessment is to be read with the 3Dimensional, verified photomontage booklet which accompanies Chapter 11 (**EIAR Main Report**). The site location and its hinterland were examined.

There are specific considerations at each viewpoint which are addressed in **Section 11.5.4** (**Chapter 11 - EIAR Main Report**)

The selected viewpoints were assessed, and this is summarised as outlined in **Table NTS 11.1** below:

Table NTS 21.1: Predicted Visual Impacts on Selected Viewpoints Assessed – Construction Phase

Viewpoint No.	**Location**	**Sensitivity**	**Magnitude of Change**	**Significance of Effects**	**Nature of effects**
VP1	Cooladangan	High	Medium	Significant	Adverse
VP2	Moneylane	High	High	Very Significant	Adverse

VP3	Moneylane	High	Medium	Significant	Adverse
VP4	Ballyduff South	High	Low	Moderate to Slight	Adverse
VP5	Ballyduff North	High	Low	Moderate to Slight	Adverse
VP6	Ballyduff North	High	Low	Moderate to Slight	Adverse
VP7	Mill Meadows	High	Low	Slight	Adverse
VP8	Knockanrahan Upr	High	Negligible	Not Significant	Neutral

Visual Impact – Operational Phase

The operational phase of the project will not have any additional large impacts on visual receptors. There will be no change to structures in the views from the construction phase. There will be more vehicular movement into and out of the facility.

There are specific considerations at each viewpoint which are addressed in **Section 11.5.5** (**Chapter 11 - EIAR Main Report**).

The selected viewpoints were assessed, and this is summarised as outlined in **Table NTS 11.2** below:

Table NTS 11.2: Predicted Visual Impacts on Selected Viewpoints Assessed – Construction Phase

Viewpoint No.	**Location**	**Sensitivity**	**Magnitude of Change**	**Significance of Effects**	**Nature of effects**
VP1	Cooladangan	High	Low	Moderate	Adverse
VP2	Moneylane	High	Low	Moderate	Adverse
VP3	Moneylane	High	Low	Moderate to Slight	Adverse
VP4	Ballyduff South	High	Low	Moderate to Slight	Adverse
VP5	Ballyduff North	High	Low	Moderate to Slight	Adverse
VP6	Ballyduff North	High	Low	Moderate to Slight	Neutral
VP7	Mill Meadows	High	Low	Slight	Adverse

'Do Nothing' Scenario

There will be no difference to the views or the landscape for a 'Do Nothing' scenario. It is likely the site will remain as pastoral grassland until development pressures are exerted on the area as the town of Arklow grows in the future. It is unlikely senescent trees will be replaced without a requirement due to development.

11.3 Cumulative Impact

There are no other known proposals of a similar nature planned for this area. The significance of effects will therefore be no greater on the landscape or visual receptors than as assessed above.

11.4 Mitigation Measures

The following landscape protection and landscape impact mitigation measures should be put in place to avoid, eliminate, or minimise any potential landscape and visual impact associated with the construction of the Proposed Development.

- Any area of site subject to soil disturbance is to be repaired, the soil reworked into the site, recontoured and modelled. Matching sod/seed sown to blend the topography back into the rural landscape.
- All construction materials, fill, gravel, etc to be removed from the site and surrounding fields once the works are complete.
- Earthworks and hedgerow banks to facilitate appropriate drainage for the soil type and this to be detailed at the design detail stage.
- An irrigation plan to be put in place to allow for establishment of plantings with the irrigation water source to be identified prior to the spring of the first year of planting. A plan to irrigate in hot weather and as required to be put in place especially for the first two years after planting. Recovered process water which has been cooled may be used.

Avoidance Prevention Reduction and Offsetting

Mitigation is discussed below as a measure of avoidance, prevention, reduction and offsetting of impacts and effects. The positioning of the digestion tanks into the topography along with specified screen planting reduces impact of the structures against the skyline. Other measures include;

Disease

- The avoidance of *Fraxinus excelsior*, ash, in any planting will not only protect existing landscape trees from the biologically infectious chalara disease, but it will also protect the local habitats that ash supports for as long as possible, by avoiding this biosecurity risk.

- Any plant materials brought on site to be disease free of local provenance, to at a minimum hold all relevant plant passports and preferably be sourced field grown and inspected at source prior to planting. This is to avoid spreading potential infections to local populations. All trees and shrubs will conform to the specification for nursery stock as set out in British

Standard 3936 Parts 1 (1992) and 4 (1984). Advanced Nursery stock trees where used in tree planting shall conform to BS 5236.Standards for plant establishment to conform to at a minimum BS 8545:2014 Trees: from nursery to independence in the landscape.

Topsoil

- Avoid bringing any additional topsoil on site. Use local soil to make localised repairs. Where additional topsoil is required use from a matching source as local as possible to the Proposed Development. Do not mix topsoil and sub soil during construction. Identify storage area where soils are to be stored separately until they are reworked into the contours.

Invasive Species and Biohazards

- Avoid spreading or bringing invasive plant species onsite in soil or plant materials. Soil and plant material hygiene to be observed and plant, boots, tools, and equipment to be clean before being brought on site. All involved at the construction stage to be made aware of this prior to coming on site.

  Invasive Alien Plant Species include;
  - Japanese knotweed *Fallopia japonica*
  - Giant knotweed *Fallopia sachalinensis*
  - Bohemian knotweed *Fallopia x bohemica*
  - Himalayan knotweed *Persicaria wallichii*
  - Old man's beard *Clematis vitalba*
  - Winter heliotrope *Petasites fragrans*
  - Garden Yellow Archangel *Lamiastrum galeobdolon ssp argentatum*

  Of these, knotweed is most likely to be problematic if introduced on site.

- *Thaumetopoea processionea*, commonly known as the Oak Processionary Moth (OPM) is not to be brought onsite and reported immediately to the Department of Agriculture, Food and the Marine (DAFM), if identified on or near to the site.
- *Xylella fastidiosa* also presents a threat to new and existing planting and is to be avoided and reported to DAFM if detected on or near the site.
- All hedgerows and hedgerow trees to be protected during the construction process with a root protection zone established, prior to the commencement of construction. No root systems to be trenched severed or cut and there is to be no piling of building materials, soil, plant, containers, or any loading material on the protected root zone during construction. All parties involved in the construction process to be made aware of this avoidance measure. No unnecessary damage is to occur to the existing tree and hedgerow complex during construction or afterwards during operations. At the detailed design stage tunnelling is to be preferred over trenching where pipework interacts with existing hedgerow systems in selected areas. This is to minimise the impact of pipe works on adjacent hedgerow structures.
- Palisade fencing is to be screened with hedging and trees.
- Planting specifications to be overseen by a qualified landscape architect during the construction and operational period as required.

Reinforcing landscape

Any damage to field boundaries received during construction to be repaired in the traditional manner. Low banks for planting trees and hedgerows are to be reinforced where possible. The screening planting and new tree planting will reinforce much of the landscape pattern.

Following correct landscape construction and planting, all plant material is to be properly and satisfactorily, irrigated pruned and given correct amounts of appropriate fertiliser to ensure plant health and vigour.

Landscape Maintenance and Management Plan

- A landscape management plan is to be produced and ready post construction so that all new and existing planting, hedgerows, and trees will be immediately cared for and promptly maintained. This plan along with any necessary method statements to be produced during the operational phase of the planting by a qualified landscape architect.

- Landscape maintenance and management plans ought to remain in place until all plantings are fully established and during the life of the Anaerobic Digestion Facility. The aim of the plan is to continue to ensure landscape character is maintained as well as biodiversity and habitat protection.

- A landscape maintenance and management plan will include a small woodland/hedgerow management plan and will address appropriate hedgerow cutting, timing of operations, protection of hedgerow habitats, address irrigation of newly planted trees or infill plants, accessing water, pruning, weeding, fertilising, trimming, management of dead and diseased wood, and general maintenance. Plant establishment to be provided for appropriately. All amelioration as required for good plant establishment to be tailored to the plants, trees, and hedgerows to satisfy their continued growing needs.

- The mitigation measures as outlined are conducted throughout the life of the operation.

- Periodically the landscape maintenance and management plans to be reviewed to ensure growth, screen establishment and general appearance of the site is fulfilling its original intent. Stake belts are to be loosened as required and stakes cut down and or removed as appropriate.

- Hedgerow maintenance and laying are to occur outside of the nesting season and where hedgerows are weak and require significant work to rejuvenate the hedgerows, this to be completed on each side, on alternate years.

- Flowering hedgerow plants and other pollinators are to be factored into the hedgerow cutting regime with respect to timing of operations.

- Tree surgery is to be used to ensure the longevity of the mature trees on the site boundaries.

Buildings and Structures

The colour of the buildings as selected will blend into the landscape similarly to agricultural buildings. Wall colours are to be lighter than roof colour. A suitable dark green specification is to be applied on all metal cladding. The least reflective colours to be chosen to avoid light reflection and to reduce the apparent size of the buildings in the landscape. Standards as

expected for large agricultural buildings to be applied to prevent incongruent colour choices on the buildings and structures.

Failure of Mitigation Measures

The landscape proposals can be regarded as mitigation measures in this context. A good diversity and mix of species sizes and varieties along with the landscape management proposals as outlined above will ensure there is little chance of complete failure of the planting. In the unlikely event that this is the case, the screening potential of trees will be lost and the ability of the landscape to absorb the development will be diminished. The potential visual amenity that maturing trees lend to a landscape will also be lost. The long term and permanent benefit of trees will also be lost if there is a failure of planting as a mitigation measure. Should failure occur, the entire planting proposals will have to be reinstated upon detailed examination as to why they were not successful in the first instance. Competent and qualified horticulturist to be employed to plant, establish and manage the landscape and trees once they are growing effectively.

11.5 Interactions and Cumulative Impact

Other environmental impacts which will interact with landscape and visual impacts in the case of this Proposed Development are Biodiversity and Archaeology under the following headings (see **Section 11.7**, **Chapter 11**, EIAR Main Report for details):

11.6 Residual Impacts

Once all mitigation measures have been implemented and there is ongoing care provided to the landscape tree planting and hedgerows over the life of the project, the Proposed Development will not be hidden but it will be effectively screened, and a plantation of trees will be an addition to the landscape.

Year on year the development of taller trees will continue to absorb the Proposed Development at Viewpoints 1 and 2. Apart from the impacts as outlined in the assessment above, no further residual impacts are expected.

12 Traffic & Transport

ORS conducted an assessment of the likely impact of the proposed development on the traffic flows and transport infrastructure within the site of the Proposed Development and the wider area.

The proposed development site is situated in the townland of Moneylane, Arklow, Co. Wicklow.

The objectives of this chapter (Chapter 12 – Traffic & Transport) are to assess:

- The prevailing traffic conditions on the public road network in the vicinity of the Proposed Development that may influence conditions.
- The potential effect on the surrounding road network due to the anticipated traffic generated by the Proposed Development.
- The proposed access arrangements for the Proposed Development.
- Review of committed developments adjacent to the Proposed Development.
- The pedestrian, cyclist and public transport connectivity in the vicinity of the site.
- The parking requirements for the site.

12.1 Receiving Environment

Traffic and transport-related infrastructure considered in relation to the Proposed Development are listed below:

- Site Access
- Car Parking
- Cycle Storage
- Existing Road Network
- Proposed Road Network Improvements
- Existing Traffic Flows
- Committed Developments Traffic Generation
- Future Year Traffic Growth

Site Access

The site will be accessed via a proposed access road along the Ballyduff South Road (L6187) and vehicles travelling between the proposed site access and the surrounding network will make use of the L6187 local road. Vehicular access to the site is through a new proposed priority T-junction off the L6187 to the west of the site.

1No. passing bay will be provided along this road stretch, from the junction formed by the L2190 and the L6187 and northwards up to the site access, to facilitate the simultaneous passage of two large vehicles. 12No. car parking bays are provided to the southwest of the office area, while one circulation area (concrete apron) close to the Digestate Storage and the Reception Hall will be used for articulated lorry turning and reversing. An internal asphalt road will provide access to the Energy Hub to the southeast.

Car Parking

The site will have between 3No. to 5No. staff members on site at the same time. The number of

parking spaces provided for staff and visitors of the development is 12No. spaces, located adjacent to the office building, with 1No. accessible parking space and 3No. dedicated EV charging points. The parking spaces provided are considered sufficient for the expected levels of traffic associated with the site.

Cycle Storage

Due to the nature of the development and the reduced number of staff accessing the site, trips by bicycle are not anticipated. There are currently no bicycle lanes on the surrounding local network and no dedicated means of accessing the site by bicycle other than by the proposed access point off the L6187.

Notwithstanding, the Proposed Development includes provision for 10No. bicycle parking spaces, aligning with the guidelines established in the Wicklow County Development Plan.

Existing Road Network

The Proposed Development plans include providing vehicular access from the L6187 to the west of the site. This access will primarily be via the Local Road L6187 and the M11 Motorway, located south of the site, and will utilise the L6187/L2190 junction. This crossroads is a 4-arm priority junction and the traffic associated with the site is expected to use this junction for both arrivals and departures. Traffic associated with the Proposed Development will be routed to avoid the L2190 – Knockenrahan (or Coolgreaney Road).

The L6187 is a single lane carriageway of approximately 4m wide. The L6187, also known as Ballyduff South Road, primarily serves as a local access route for residents and agricultural activities in the Ballyduff South area. It is a narrower rural road, with sections where the width allows for single-lane traffic and passing bays. The L6187 does not feature road markings, and its alignment includes several bends and undulating sections typical of a rural roadway. Traffic volumes on the L6187 are low, consistent with its use as a minor road serving a sparsely populated area. At the L2190/L6187 junction, the road lacks road markings, which are essential for guiding vehicle drivers effectively. Currently, only a 'STOP' sign is present, which may not provide sufficient guidance for vehicles travelling down the local road. The alignment of the L6187 road in the area surrounding the Proposed Development site is relatively straight, with only minor curves. Additionally, the L6187 road does not feature footpaths or cycle lanes along either side of the carriageway. Furthermore, there are no streetlights installed in the vicinity of the application site.

The Proposed Development site is located adjacent to the L2190 local road. The L2190, also referred to as Knockenrahan or Coolgreaney Road, is a local road to the southwest of Arklow town in County Wicklow. This road connects Arklow to the surrounding rural areas, including the village of Coolgreaney, where it meets the R742 regional road. Within Arklow, it serves as a key route for accessing residential areas and local amenities, while also facilitating travel between the town and the countryside. Traffic associated with the Proposed Development will be routed to avoid the L2190 – Knockenrahan (or Coolgreaney Road).

Traffic volumes on the L2190 can be characterised as moderate closer to Arklow, particularly during peak commuting hours, with lighter volumes further into rural areas. The road is a single carriageway throughout, with a general width of approximately 5m near its junction with the L6187. In this section, there are no road markings, reflecting its rural context and the relatively low-speed nature of local traffic.

There are no footpaths or cycle lanes provided along the L2190 road, in the vicinity of the site access. The posted speed limit on the L2190 is 80 km/h.

Proposed Road Network Improvements

At present, Wicklow County Council has no road improvement schemes on the L6187 or the L2190 that would affect the Proposed Development.

Existing Traffic Flows

Automated Junction Turning Counts (JTC) have been undertaken at the L2190/L6187 crossroads junction and the M11 Junction 21 on Tuesday 10th December 2024 by a third-party company named IDASO. The traffic counts were carried out during a 12-hour period from 07:00 AM to 07:00 PM. The traffic counts have been used to obtain accurate data on the prevailing traffic conditions along the road network in the vicinity of the site and to predict future traffic conditions. The traffic counts encompassed all movements of traffic: pedal cycles, cars, buses, LGVs and HGVs. The final number of traffic is presented in Passenger Car Unit (PCU). PCU is the impact that a mode of transport has on traffic compared to a single car, e.g., a private car represents 1 PCU whereas an HGV represents 2.3 PCUs.

The AM and PM traffic peak periods were identified at the junctions, occurring between 08:15 and 09:15 in the morning and between 15:45 and 16:45 in the evening. However, there was a slight variation in peak hours for the southeastern roundabout of the M11 Junction 21 (Arklow Roundabout), with peak times recorded between 08:30 and 09:30 during the AM and 16:00 and 17:00 for the PM. Results are summarised in **Table NTS 12.1** below.

Table NTS 12.1: April 2024 Traffic Counts

Junction	AM Peak (PCU)	PM Peak (PCU)
1 – L2190/L6187 Junction	480	365
2a – M11 Junction 21 (Ballynattin Roundabout)	1093	841
2b – M11 Junction 21 (Arklow Roundabout)	953	1134

Committed Developments Traffic Generation

As per the records available on the Wicklow County Council planning website, one significant planning application has been identified southeast of the site, located off the R772 near M11 Junction 21 (JTC2), under Ref. No. 24/88. This development is assumed to be completed and operational by 2027, the expected completion year for the proposed AD Plant. Information on traffic generation for the development was found on the documents available on the planning application public folder. The traffic generation was then added into the projected junction traffic to simulate the worst-case scenario.

Future Year Traffic Growth

Transport Infrastructure Ireland (TII) issues a range of forecasts: low growth, central growth and high growth. The implementation of policies relating to the National Sustainable Mobility

Policy will act as a deterrent to high growth in car-based travel. Low growth factors are however likely to be equally unrealistic at present, therefore, this assessment has used central growth factors, which was extracted from the TII Publication PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, published in October 2021, outlined in **Tables NTS 12.2** to **12.4** below.

The data used is for County Wicklow from 2016 to 2050 and is for Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs).

Table 12.2: Development Location Information

Development Location Information	
Location of Development	Wicklow
Sensitivity Area	Central
Year of Traffic Counts	2024
Year of Assessment	2025
Year of Development Construction	2027

Table 12.3: TII Annual Growth Rates (Central Growth) For Co. Wicklow

TII Annual Growth Rates (Central Growth) For Co. Wicklow		
	LGV	**HGV**
2016 – 2030	1.0157	1.0377
2030 – 2040	1.0051	1.0173
2040 – 2050	1.0047	1.0204

Table 12.4: Growth Factors for Future Design Years

Growth Factors for Future Design Years				
	Counts	**Opening**	**Opening +5**	**Opening +15**
Year	2024	2027	2032	2042
LGV	1.000	1.048	1.109	1.166
HGV	1.000	1.117	1.292	1.543

12.2 Assessment of Impacts

Construction Phase

During the construction phase, deliveries and construction personnel will access the site on a daily basis. The arrivals and departures are expected to be spread out throughout the day; however, it is expected that they will be arranged in a manner to avoid traffic peak hours in the surrounding road network.

The construction will operate within Wicklow County Council's recommended hours, which are from 08:00 to 18:00 from Monday to Friday and between 08:00 to 14:00 on Saturdays. No works shall be carried out on Sundays and public holidays or outside the aforementioned hours. Construction traffic associated with the Proposed Development will include:

- Construction personnel accessing the site by private vehicles and vans
- Delivery of materials (here include what type of materials) by vans and HGVs
- Earthworks machinery (excavators, rollers and dumper trucks) transported by HGVs

- HGVs for the export surplus excavated material.

It is expected a maximum of 8No. to 10No. construction personnel to be at the site at the same time and the deliveries to be arranged during off-peak hours.

Haul routes for construction traffic are to be agreed upon with Wicklow County Council during the preparation of the Construction Traffic Management Plan (CTMP).

Table NTS 12.5 below shows the expected generated traffic during construction phase.

Table 12.5: Expected Traffic During Construction Phase

Construction Traffic			
Time Range	**Arrivals**	**Departures**	**Total**
08:00-09:00	10	0	**10**
17:00-18:00	0	10	**10**

Operational Phase

The operation of an Anaerobic Digestion Facility involves producing renewable biogas through the decomposition of organic feedstock. The site will be operational 24 hours a day for 7 days a week with staff onsite during normal working hours from 6 AM to 8 PM. Outside of these hours, the process is monitored remotely. There are no shifts, and it is expected that between 3 and 5 staff members will be present at the premises during normal working hours. The Proposed Development will receive an intake of approximately 90,000 tonnes of feedstock per annum for anaerobic digestion. The process will produce a methane-rich biogas, which is converted into renewable energy or upgraded to biomethane which is injected to the natural gas grid, and a nutrient-rich fertiliser known as 'biobased fertiliser'.

The solid materials will arrive at the site by HGV/Walking Floor and the liquid form feedstock will arrive in bulk tankers. The average tonnes per load are assumed to be 30 tonnes. It is expected that traffic will be spread out throughout the day in order to minimise traffic issues in the road network.

Table NTS 12.6 shows the expected feedstock accepted in the facility.

Table NTS 12.6: Feedstock Intake Data

Feedstock in	Tonnes/year (312 days)	Tonnes/day	Average Load (T)	HGV-Tanker/day	Route	Total in/out Movements
Cattle Slurry	7,159	23	30	1	Local Roads (from East)	2
	4,772	15		1	Local Roads (from West)	2
Cattle Manure	781	3		1	Local Roads (from East)	2
	521	2		1	Local Roads (from West)	2
Poultry Litter	22,981	74		3	M11, L6187	6
Vegetables Residues	1,302	4		1	M11, L6187	2
Drinks Production Residues	18,595	60		2	M11, L6187	4
Dairy Production	9,077	29		1	M11, L6187	2

Residues						
Whole Crop Silage	17,368	56		2	M11, L6187 (from East)	4
	7,444	24		1	M11, L6187 (from West)	2
Subtotal	**90,000**	**288**		**14**		**28**

*It is important to note that the cattle manures and slurries will be sourced from agricultural operators located in the vicinity of the site. Access to the site will be facilitated via local roads, **excluding routes to the north of Knockenrahan (Coolgreaney Road), which will not be used for transport.**

The feedstock will go through a digestion process and will produce a product named 'biobased fertiliser', which will be in form of fibre and liquid. Biobased fertiliser will be supplied for use on agricultural lands as a direct replacement for chemical/mineral fertilisers. It is proposed to provide biobased fertiliser to agricultural operators in the locality, particularly those who are providing crop-based feedstocks, thereby promoting a local circular bioeconomy.

Biobased fertiliser can be land spread during the spring, summer, and early autumn, but cannot be spread during the land spreading close period. During this winter period, biobased fertiliser will be stored on site. The number of transport movements will, therefore, generally remain the same throughout the year and reduce slightly during October-January.

Table NTS 12.7 shows the expected tonnes of biobased fertiliser produced by the facility.

Table 12.8: Biobased Fertiliser Transport Data

Product	Tonnes/year	Tonnes/day (312 days)	Average Load (T)	HGV/Trailer/day	Total in/out Movements
Digestate Liquid Concentrate	17,000	55	30	1.83	4
Digestate Fibre	8,000	26		0.87	2
Subtotal	**25,000**	**71**		**3 (2.70)**	**6 (5.40)**

As already mentioned, the Proposed Development will employ approximately 5No. full time staff to operate the Anaerobic Digestion Facility. The traffic generated by the staff will consist of 5No. daily incoming trips and 5No. daily outgoing journeys.

Table NTS 12.8 contains the trip generation associated with staff.

Table NTS 12.8: Staff Traffic Generation

	AM	PM
Arrivals	5	0
Departure	0	5
Total staff movements	**5**	**5**

Table NTS 12.9 summarises the expected traffic volumes and volumes of material generated by the feedstock input to the Proposed Development and the export of biobased fertiliser. The anticipated total traffic flows in and out of the site amount to an **average of 22No. vehicles** per day (44No. trips in and out in total), including approximately 34No. HGVs/Walking Floor/Tankers per day associated with the input of material and the export of biobased fertiliser.

These estimates are based on the maximum amount of organic feedstock the development can process, the maximum amount of biobased fertiliser removal from the Proposed Development, and the predicted staffing levels required to operate the facility.

Table NTS 12.9: Total Movements In and Out of the Site on National Roads

	HGV/Walking Floor/Tankers/day	HGV/Walking Floor/Tankers/day in/out	Staff (in/out)	Total in/out Movements
Total Movements	17	34	5 (10)	44

The site will be operational 24 hours a day, 7 days a week, however, delivery of feedstock and export of fertiliser will be limited to occur only between 07:00 and 19:00 Monday to Friday and 07:00 to 16:00 on Saturday. As can be noted from the traffic generation profile shown above, there is no particular peak of traffic generated by the development, save for the times when staff arrive and depart from work. However, it has been assumed that in a worst-case scenario the projected delivery and export of material will take place during morning and evening peak hours, with an even spread of traffic for both periods.

Table NTS 12.10 illustrates the expected AM and PM traffic flows associated with the Development.

Table NTS 12.1o: Expected AM and PM Traffic Flows

	Arrivals	Departures	Total
AM	14	8	22
PM	8	14	22
Average movements			**44**

In summary, the trip rate profile for the Proposed Development has been interpreted from first principles and has been sufficiently loaded to reflect a ‘worst-case scenario’. The trip rates are relevant given the type of development and the type of use. The trips found indicate that the level of traffic activity associated with this type of development is small and will correspond to approximately 3% of the L6187capacity, in the vicinity of the site. The figures derived from the first principles analysis are very robust, as a ‘worst case scenario’, the total daily trips expected from the development are 44.

With regard to HGV movements generated by the site, of the 44No. trips associated with the site, 34No. will involve heavy vehicles. Traffic counts indicate that during the AM peak, 11% of traffic exiting Ballyduff South onto the L6187 consisted of HGVs, while no heavy vehicles (0%) turned onto the L2190. Additionally, 43% of traffic exiting the L6187 and the M11, traveling northbound towards Ballyduff South, and 21% of traffic turning right onto the L2190 eastbound were composed of HGVs. The average percentage of HGVs at the junction during the morning peak was estimated to be 4.3% based on the 2024 traffic counts.

During the PM peak, 57% of traffic exiting Ballyduff South onto the L6187 consisted of HGVs, with no heavy vehicles (0%) turning onto the L2190. Furthermore, 25% of traffic on the L2190 turning right onto Ballyduff South consisted of HGVs. The average percentage of HGVs at the junction during the evening peak was estimated to be 4.5% based on the 2024 traffic counts.

Consequently, the additional HGV movements from the site are projected to increase HGV volumes on the junction by ca. 4%.

12.3 Mitigation Measures

Construction Phase

A summary of all mitigation measures for the construction phase to ensure minimum impact on traffic and transport infrastructure is listed below:

- A detailed Traffic Management Plan (TMP), produced in accordance with Chapter 8 of the Traffic Signs Manual, will be finalised and agreed upon with the Local Authority prior to construction works commencement. The following mitigation measures are proposed during the construction phase of the development.
- Appointment of a Construction Project Manager to be responsible for the day-to-day implementation of measures outlined in the TMP
- Identify routes to be used in the delivery and export of materials to the site and routes that shall be avoided by HGVs
- Monitor the condition of the roads throughout the construction period and a truck-mounted vacuum mechanical sweeper will be assigned to roads along the haul route as required
- Access to the site to be monitored at all times by a banksman who will direct traffic safely into the construction site and facilitate the safe navigation of larger construction vehicles

Operational Phase

The operational phase of the development will generate a maximum of 44No. vehicle movements day, where 34No. are HGVs and 10No. are private vehicles and vans. The additional vehicles will represent a maximum of 5.5% increase in traffic and will not generate increased queues and delays along the road network in the vicinity of the site, therefore, no mitigation measures are proposed for the operational phase of the development.

12.4 Residual Impacts

the proposed construction and operational phase of the development will generate a minimal impact on the road network in the vicinity of the site. The proposed mitigation measures proposed will also help reduce or eliminate any potential impact associated with the proposal.

The proposal, off the L6187 Local Road, close to the L2190 local road, is located in an 80km/h speed limit zone and the narrow road width of the L6187 will not give rise to potential hazards, on the other hand, will reduce traffic speeds and increase road safety benefits.

Queuing of vehicles is not anticipated on the L6187 due to the low number of vehicles predicted to enter the site on a daily basis. The proposal will have no negative impact on the overall road network associated with the proposed construction and operational phase of the site.

Overall, it is assessed that the development will have a neutral, slight and long-term effect.

13 Archaeology & Cultural Heritage

Site Overview and Archaeological Context

The Proposed Development site is found in the townland of Moneylane, Arklow, Co. Wicklow, approximately 2.1km southeast of the town of Arklow, Co. Wicklow and approximately 23km southwest of Wicklow Town, Co. Wicklow. This Proposed Development site is in agricultural grazing land, the boundaries of which are demarcated by mature trees and hedgerows. The total site area measures *ca*. 4.02ha. There are no recorded monuments within the immediate vicinity of the Proposed Development site. The closest monument is WI045-017----, a possible fulacht fiadh, slot-trenches, pits and post-holes which were excavated in 2003 (Excavation Licence 03E1692) in advance of the development of the Arklow IDA Enterprise Park which is located roughly 770m to the southeast. There were no other cartographic anomalies or features noted during either the desk or field survey.

There is no National Inventory of Architectural Heritage (NIAH) or Record of Protected Structures (RPS) sites within the immediate vicinity of the Proposed Development site. The nearest RPS or NIAH site is NIAH No. 16322011: Saint Gabriel's Cemetery located roughly 900m east of the site.

Cultural Heritage Assessment

The assessment aimed to identify potential impacts of the Proposed Development on archaeological and cultural heritage resources through a desktop study and field survey, following guidelines from the Department of Housing, Local Government and Heritage, the National Monuments Acts (1930-2005), and the Wicklow County Development Plan 2022 – 2028. A field inspection, conducted on November 8th, 2024 revealed no significant cultural heritage features within the proposed development site. It is noted that appropriate measures must be taken to ensure minimal impact on the surrounding environment e.g. sensitive site development and screening to ensure minimal visual impact.

13.1 Existing Environment

Archaeological Baseline Data

A comprehensive assessment was conducted to identify potential impacts on archaeological and cultural heritage resources. This included a desktop study and field survey, both of which revealed no significant archaeological features within the proposed development site

Site Inspection

A field inspection was carried out on the 8th of November 2024 which entailed walking the Proposed Development site noting and recording the terrain type and land usage, the presence of features of archaeological or historical significance and visually investigating any suspect anomalies observed to determine their nature and provenance where possible.

Nothing of archaeological significance was noted during the site inspection.

13.2 Potential Effects

Potential Direct Effects

Recorded Archaeological Monuments

The Proposed Development will have no direct physical effect on known archaeological sites and monuments and will not impact the visual amenity of any known monuments

Unrecorded Archaeological Monuments or Features

There is a low to moderate potential to impact on previously unknown archaeological sites.

Architectural Sites

The Proposed Development will have no direct physical effect on known architectural sites and will not impact the visual amenity of these sites/features.

'Do Nothing Scenario'

If the Proposed Development were not to proceed, there would be no effect upon the archaeological, architectural, or cultural heritage resource.

Potential Effects on the Setting/Operational Effects

Impacts on Setting can be reduced with sensitive site development and screening.

13.3 Cumulative Effects

The permitted and proposed developments within a 500m study area have been considered as part of the cumulative impact assessment. As the Proposed Development will not result in any impacts on the architectural heritage resource, no cumulative impacts have been identified.

13.4 Mitigation Measures and Residual Effects

The mitigation strategies recommend archaeological testing prior to construction, with a qualified archaeologist overseeing the process, to assess and manage any discovered archaeological materials. All findings will be reported to the relevant authorities, and appropriate preservation or excavation measures will be implemented as needed, subject to approval by the National Monuments Service.

14 Material Assets

ORS conducted an assessment of the likely impact of the proposed development on the material assets within the site of the Proposed Development and the wider area.

The objectives of this chapter (Chapter 14 – Material Assets) are:

- To provide a baseline assessment of the receiving built services in the vicinity of the Proposed Development.
- To identify any potential negative effects posed by the construction and operational phases of the Proposed Development.
- To propose suitable mitigation measures to prevent or reduce the significance of the negative effects identified.
- To consider any significant residual effects of cumulative effects posed by the Proposed Development.

14.1 Receiving Environment

Material Assets considered in relation to the Proposed Development are listed below:

- Roads Infrastructure
- Foul Water Network
- Surface Water Network
- Public Water Network
- Gas Infrastructure
- Electricity Network
- Telecommunications Network
- Municipal Waste

The following paragraphs provide an overview of the existing receiving environment in relation to Material Assets under the aforementioned headings.

Roads Infrastructure

The Proposed Development plans include providing vehicular access from Ballyduff South Road (L6187) to the south of the site. This access will primarily be via the Local Road L6187, located south of the site, and will utilise the Ballyduff South Road (L6187) / Knockenrahen Road (L2190) junction. Traffic will travel along Ballyduff South Road (L6187 towards the R772 and use exit 21 onto the M11 on all inward and outward-bound journeys. Most of the traffic associated with the site is expected to use this junction for both arrivals and departure.

The L6187 is a single lane carriageway of approximately 4m wide. The L6187, also known as Ballyduff South Road, primarily serves as a local access route for residents and agricultural activities in the Ballyduff South area. It is a rural road, with sections where the width allows for single-lane traffic and passing bays.

Traffic volumes on the L6187 are low, consistent with its use as a minor road serving a sparsely populated area. The alignment of the L6187 road in the area surrounding the Proposed Development site is relatively straight, with only minor curves. The L6187 road does not feature footpaths or cycle lanes along either side of the carriageway.

The Proposed Development site is located adjacent to the L2190 local road. The L2190, also referred to as Coolgreaney Road, is a local road to the southwest of Arklow town in County Wicklow. This road connects Arklow to the surrounding rural areas, including the village of Coolgreaney, where it meets the R742 regional road. Within Arklow, it serves as a key route for accessing residential areas and local amenities, while also facilitating travel between the town and the countryside.

Traffic volumes on the L2190 can be characterised as moderate closer to Arklow, particularly during peak commuting hours, with lighter volumes further into rural areas. The road is a single carriageway throughout, with a general width of approximately 5m near its junction with the L6187.

There are no footpaths or cycle lanes provided along the L2190 road, in the vicinity of the site access. The posted speed limit on the L2190 is 80 km/h.

At present, Wicklow County Council have no improvement schemes on Ballyduff South Road (L6187), Knockenrahen Road (L2190), that would affect the Proposed Development.

Foul Water Network

The site does not feature access to the public foul water network at present.

The Proposed Development will have a maximum of 10 workers on site each day with normal loadings of 60L/day and BOD of 20g/day. The wastewater from the toilet and canteen will be treated using a proprietary system as recommended in the Site Suitability Assessment.

Surface Water Network

At present, the site does not feature dedicated surface water infrastructure.

Public Water Network

The Proposed Development will not be connected to the public water network. The water supply for the Proposed Development is organised into three categories: Fire Water, Grey Water, and Potable Water.

Fire Water: This supply is sourced from roof drain runoff, which is conveyed through underground piping and stored in an underground tank.

Grey Water: This is produced from rainwater harvesting and the reverse osmosis process within the facility and will be used for toilet flushing.

Potable Water: Clean water for drinking and cleaning will be delivered to the site.

Any other water, for example wash water, will be supplied from rainwater harvesting or from treated process water. This water will go through UV treatment before storage and use.

Gas Infrastructure

Biomethane will be supplied to the existing gas network via the Grid Injection Unit (GIU) and a

new pipeline connecting the site to the existing medium pressure distribution gas pipeline located ca. 835m southeast from the site at the IDA Arklow Business Park. The pipeline will be installed along Ballyduff Road and connect with the existing medium pressure distribution gas pipeline network.

The Grid Injection Unit (GUI) will be owned and operated by Gas Networks Ireland. Gas Networks Ireland (GNI) has confirmed that the existing grid capacity is adequate to accommodate the production output of the Proposed Development. All works to the existing and proposed gas pipelines will be carried out by GNI in accordance with *Standard I.S. 328 2021 Gas transmission – Pipelines and pipeline installations.*

14.2 Assessment of Impacts

Construction Phase

The construction phase is likely to yield the most disturbance to existing material assets in the vicinity of the site. Potential construction phase impacts are considered in detail in Section 14.5.1 of the EIAR – Main Report and summarised in **Table NTS 14.1** below:

Table NTS 14.1: Construction Phase Effects (Unmitigated)

Asset	Potential Environmental Effects	Quality	Significance	Duration
Roads Infrastructure	Increased flow of construction-related traffic. Establishing the site entrance and the pipeline connection to the existing gas network will require the implementation of temporary traffic management measures along the Ballyduff South Road (L6187) and Knockenrahen Road (L2190)	**Neutral to Negative**	**Slight**	**Brief to Temporary**
Foul Water Network	During the construction phase, welfare facilities for staff will be supplied via portable toilets and waste collected and tankered offsite. A domestic scale wastewater treatment plant is proposed for installation during construction stage. It has been concluded that the soils at the Proposed Development have sufficient absorption capacity for the installation of a percolation area.	**Neutral**	**Slight**	**Temporary**
Surface Water Network	Contaminated runoff reaching surface water receptors. Spillage of contaminants such as fuels, oils, chemicals, and cement material and subsequent migration into surface water receptors.	**Negative**	**Slight**	**Temporary**

Public Water Network	The Proposed Development will not be connected to the public water network.	**Neutral**	**Slight**	**Brief**
Gas Infrastructure	Disruption to existing network while establishing connection.	**Negative**	**Slight**	**Brief**
Electricity Network	Power supply for plant and machinery during the construction phase will be predominantly supplied by generators onsite. There will be partial disruption to the existing electricity network as transmission lines and poles will have to be moved and when connection to the grid via the substation is established.	**Negative**	**Slight**	**Brief**
Telecommunications	Disruption to existing network while establishing connection.	**Negative**	**Slight**	**Brief**
Municipal Waste	The Proposed Development will generate a range of non-hazardous during site excavation and construction. Waste materials will be required to be temporarily stored on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues.	**Negative**	**Slight**	**Temporary**

Operational Phase

The operational phase effects anticipated and considered throughout the lifetime of the operation of the facility are considered in detail in Section 14.5.2 of the EIAR – Main Report and summarised in **Table NTS 14.2** below:

Table NTS 14.2: Operational Phase Effects (Unmitigated)

Asset	Potential Environmental Effects	Quality	Significance	Duration
Roads Infrastructure	A new entrance will be constructed and connected to the pre-existing road network.	**Neutral**	**Slight**	**Long-Term**
Foul Water Network	Wastewater from welfare facilities and canteen will be treated using a proprietary system as recommended in Site Suitability Assessment.	**Neutral**	**Imperceptible**	**Long-Term**
Surface Water Network	Run-off from the buildings and yards collected in a sealed pipe network which will discharge to the stream, post attenuation. Rain falling on the bunded area will be collected in a separate sealed drainage network and discharged to a sump, from which it will be pumped to the	**Negative**	**Slight**	**Brief**

	surface water drainage system for the remaining areas of the Proposed Development. During the operational phase, in the absence of mitigation it should be noted that a risk of spillage / leakage is posed because of vehicle movements while carrying materials such as biobased fertiliser or feedstocks.			
Public Water Network	Potential contamination to the local aquifer Potential risk to human health	**Negligible**	**Slight**	**Long-term**
Gas Infrastructure	Biomethane will be supplied to the existing gas network via the Grid Injection Unit (GIU) and a pipeline connecting the site to the existing medium pressure distribution gas pipeline located to the southeast of the Proposed Development. The GIU comprises equipment which will ensure that the biomethane is compliant with all necessary standards and regulations before it enters the gas network. It is projected that the Proposed Development will produce 810-960 Nm^3 of biomethane per hour, to be supplied to the existing gas network.	**Positive**	**Significant**	**Long-Term**
Electricity Network	An ESB substation will be constructed and will provide connection to the national grid, although this source of power will serve only as a backup.	**Negative**	**Slight**	**Long-Term**
Telecommunications	Increased demand on existing network.	**Negative**	**Slight**	**Long-Term**
Municipal Waste	Increased waste production of ca. 350L per week. Increased demand on waste collection services.	**Negative**	**Slight**	**Long-Term**

14.3 Mitigation Measures

Construction Phase

A summary of all mitigation measures for the construction phase to ensure maximum protection of material assets is listed below:

Roads Infrastructure

- A detailed Traffic Management Plan (TMP), produced in accordance with Chapter 8 of the Traffic Signs Manual, will be finalised and agreed upon with the Local Authority prior to construction works commencement.
- Appointment of a Construction Project Manager to be responsible for the day-to-day implementation of measures outlined in the TMP
- Identify routes to be used in the delivery and export of materials to the site and routes that shall be avoided by HGVs
- Monitor the condition of the roads throughout the construction period and a truck-mounted vacuum mechanical sweeper will be assigned to roads along the haul route as required
- Access to the site to be monitored at all times by a banksman who will direct traffic safely into the construction site and facilitate the safe navigation of larger construction vehicles.
- Traffic management measures will be implemented on a temporary basis while connections underground services (gas, telecommunications, water) are established.

Foul Water Network

- Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer.
- All foul water infrastructure to be installed in accordance with the relevant industry standards.

Surface Water Network

- 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.
- Covers are to be provided over soil stockpiles when high wind and inclement weather are encountered, if required.
- Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer.
- Landscaping to take place as soon as possible to reduce weathering.
- Harmful materials such as fuels, oils, greases, paints and hydraulic fluids must be stored in bunded compounds well away from storm water drains and gullies. Refuelling of machinery should be carried out using drip trays.

Public Water Network

- Excavations to be backfilled as soon as possible to prevent any infiltration of contaminants to the subsurface and the aquifer.

Gas Infrastructure

- All works to the existing and proposed gas pipelines will be carried out by GNI in accordance with Standard I.S. 328 2021 Gas transmission – Pipelines and pipeline installations.

Electricity Network

- Consultation with ESB and Dial-Before-You-Dig platforms prior to works on the existing electricity network.
- Implement best practice measures when working on electricity lines.
- Inform the public of when works are to be carried out to ensure they are aware of any temporary interruptions in power supply that may occur.

Telecommunications Network

- Consultation with ESB and Dial-Before-You-Dig platforms prior to works on the existing electricity network.
- Implement best practice measures when working on electricity lines.
- Consultation with Eir and Dial-Before-You-Dig platforms prior to works on the existing telecommunications network.
- Implement best practice measures when working on telecommunications lines.
- Inform the public of when works are to be carried out to ensure they are aware of any temporary interruptions in power temporary telecommunications outages that may occur.

Municipal Waste

- Inform staff through toolbox talks/training etc on the relevance and importance of correct waste segregation and management.
- Ensure waste receptacles available for the different identified waste streams to ensure proper and efficient segregation of waste onsite.
- Install signage to promote and encourage proper waste segregation, recycling etc.
- Ensure bins/skips are not allowed to overflow to prevent litter build-up onsite.
- Ensure all bins have lids and skips are covered when be removed offsite to prevent littering elsewhere.
- Ensure waste is collected by a registered vendor and disposed of at a facility licenced to take said waste.
- Maintain good waste records onsite to ensure all is accounted for.
- 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 treated prior to discharge.
- The concrete washout skip is to be located to the east of the site, where the overburden is greater.
- Excavations lined with an impermeable liner are not permitted as concrete washout bays.
- 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.

Operational Phase

A summary of all mitigation measures for the operational phase to ensure maximum protection

of material assets is listed below:

Roads Infrastructure

- The operational phase of the development will generate a maximum of 22 vehicles a day, where 17 are HGVs and 5 are private vehicles and vans. The additional vehicles will represent a maximum of 3.0% increase in traffic and will not generate increased queues or delays along the road network in the vicinity of the site, therefore, no mitigation measures are proposed for the operational phase of the development.

- Strong lines of communication with hauliers, strict delivery schedules and just-in-time delivery methods will be in operation to ensure no more than two trucks will visit the site at any one time.

Foul Water Network

- A regular schedule of foul infrastructure inspection and maintenance will be carried out over the lifetime of the Proposed Development.
- The onsite WWTP will be subject to regular desludging and maintenance, subject to manufacturer recommendations.

Surface Water Network

- Dedicated hard standing for off-loading areas will be established, 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.
- All bunds and pipelines (foul & process) will be subject to integrity assessments every 3 years by a suitably qualified engineer.
- Surface water drainage features onsite will undergo routine inspection and maintenance to ensure absence of blockages or leaks.
- The site will be subject to annual inspections from the EPA which will assess compliance with conditions outlined in the IEL. Surface water outflows from the site will be assessed as part of these inspections to ensure emissions from the site are compliant with the license.

Public Water Network

- Waste water, such as wash water, will be supplied from rainwater harvesting or from treated process water. This water will undergo UV treatment prior to use and storage.

Gas Infrastructure

- The GUI and gas connection pipeline will be installed and maintained by Gas Networks Ireland. All works to the existing and proposed gas pipelines will be carried out by GNI in accordance with Standard I.S. 328 2021 Gas transmission – Pipelines and pipeline installations.

Electricity Network

- Utilisation of power from the public grid will serve only as a backup. Power usage for the Proposed Development under normal operating conditions will be supplied by CHP and solar PV array onsite.

Telecommunications Network

No mitigation measures are proposed for the operational phase of the Proposed Development. The onsite office/canteen/staff welfare facility will require a constant telecommunications connection meaning a slight negative impact to the existing network is unavoidable.

Municipal Waste

- Inform staff through toolbox talks/training etc on the relevance and importance of correct waste segregation and management.
- Ensure waste receptacles available for the different identified waste streams to ensure proper and efficient segregation of waste onsite.
- Install signage to promote and encourage proper waste segregation, recycling etc.
- Ensure bins/skips are not allowed to overflow to prevent litter build-up onsite.
- Ensure all bins have lids and skips are covered when be removed offsite to prevent littering elsewhere.
- Ensure waste is collected by a registered vendor and disposed of at a facility licenced to take said waste.
- Maintain good waste records onsite to ensure all waste is accounted for.

Residual Impacts

Construction Phase

A summary of the predicted impacts associated with the construction phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual impacts are summarised in **Table 14.5** in Chapter 14 of the EIAR – Main Report.

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

Operational Phase

A summary of the predicted impacts associated with the operational phase in terms of quality, significance, and duration, along with the proposed mitigation measures and resulting residual impacts are summarised in **Table 14.6** in Chapter 8 of the EIAR – Main Report.

The overall impact anticipated by the operational phase of the project following the implementation of suitable mitigation measures is considered to be **negligible to positive**, **slight to significant**, and **long term**.

15 Interaction Between Effects on Different Factors

15.1 Introduction

In an Environmental Impact Assessment Report (EIAR), the interactions between chapters are crucial for providing a comprehensive understanding of how different environmental factors influence each other.

Each environmental topic chapter of this EIAR includes a dedicated section on interactions with other relevant factors. This approach is considered to meet with the requirements of applicable EU and Irish law. The likely interactions between one topic and another have been discussed under each topic chapter by the relevant specialist consultant. ORS ensured collaboration among specialist consultants to address the likely interactions between effects predicted from the proposed development. This ensured that appropriate mitigation measures were incorporated into the design process.

This section on interactions identifies the potential of unplanned but potential interactions that could occur during construction and operation of the proposed development. **Table 15.1** below identifies where it is predicated, that interactions could occur.

Table 15.1: Matrix summarising potential interactions noted between factors

Interaction	Biodiversity	Pop. & Human Health	Lands, Soils, Geology	Hydrology & Hydrogeology	Air, Odour, Climate	Noise & Vibration	Landscape & Visual	Traffic & Transport	Archaeology & Cultural Heritage	Material Assets
Biodiversity	*N/A*	✓	✓	✓	✓	✓	✓	✗	✗	✗
Population & Human Health	✓	*N/A*	✓	✓	✓	✓	✓	✓	✗	✓
Lands, Soils & Geology	✓	✓	*N/A*	✓	✗	✗	✗	✗	✗	✗
Hydrology & Hydrogeology	✓	✓	✓	*N/A*	✗	✗	✗	✗	✗	✓
Air, Odour & Climate	✓	✓	✗	✗	*N/A*	✗	✗	✓	✗	✗
Noise & Vibration	✓	✓	✗	✗	✗	*N/A*	✗	✓	✗	✗
Landscape & Visual	✓	✓	✗	✗	✗	✗	*N/A*	✗	✗	✗
Traffic & Transport	✗	✓	✗	✗	✓	✓	✗	*N/A*	✗	✓
Archaeology & Cultural Heritage	✗	✗	✗	✗	✗	✗	✗	✗	*N/A*	✗
Material Assets	✗	✓	✓	✗	✗	✗	✗	✓	✗	*N/A*

✓ Interaction ✗ No interaction

16 Schedule of Mitigation

16.1 Introduction

This EIAR has assessed the impacts and resulting effects likely to occur as a result of the Proposed Development on the aspects of the receiving environment, grouped under the following headings:

- Population & Human Health
- Biodiversity
- Lands, Soils & Geology
- Hydrology & Hydrogeology
- Air, Odour & Climate
- Noise & Vibration
- Landscape & Visual
- Traffic & Transportation
- Archaeology & Cultural Heritage
- Material Assets

Annex IV(7) of the EIA Directive, as amended, requires that the EIAR should include '*a description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases"*.

The Proposed Development will be constructed and operated in a manner that will ensure that the potential impacts on the receiving environment are avoided where possible. Where impacts or potential impacts have been identified, mitigation measures have been proposed to reduce the significance.

This Chapter of the EIAR collates and summarises the mitigation and monitoring measures detailed in **Chapter 5.0** to **Chapter 14.0.**

Mitigation and monitoring measures proposed during the construction phase are outlined in **Chapter 16** and the **Construction Environmental Management Plan (CEMP)** which accompanies this planning application**.** The main contractor appointed to construct the development will be obliged to carry out the programme of works in strict accordance with the CEMP, thus minimising the effects of the construction phase on the local environmental receptors. The local authority will be responsible for enforcing the conditions of the CEMP.

Mitigation and monitoring measures proposed during the operational phase are outline in **Chapter 16**. The site will be operated under an Industrial Emissions Licence and will be regulated by the Environmental Protection Agency (EPA), Department of Agriculture, Food and the Marine (DAFM) and the Local Authority Wicklow County Council).

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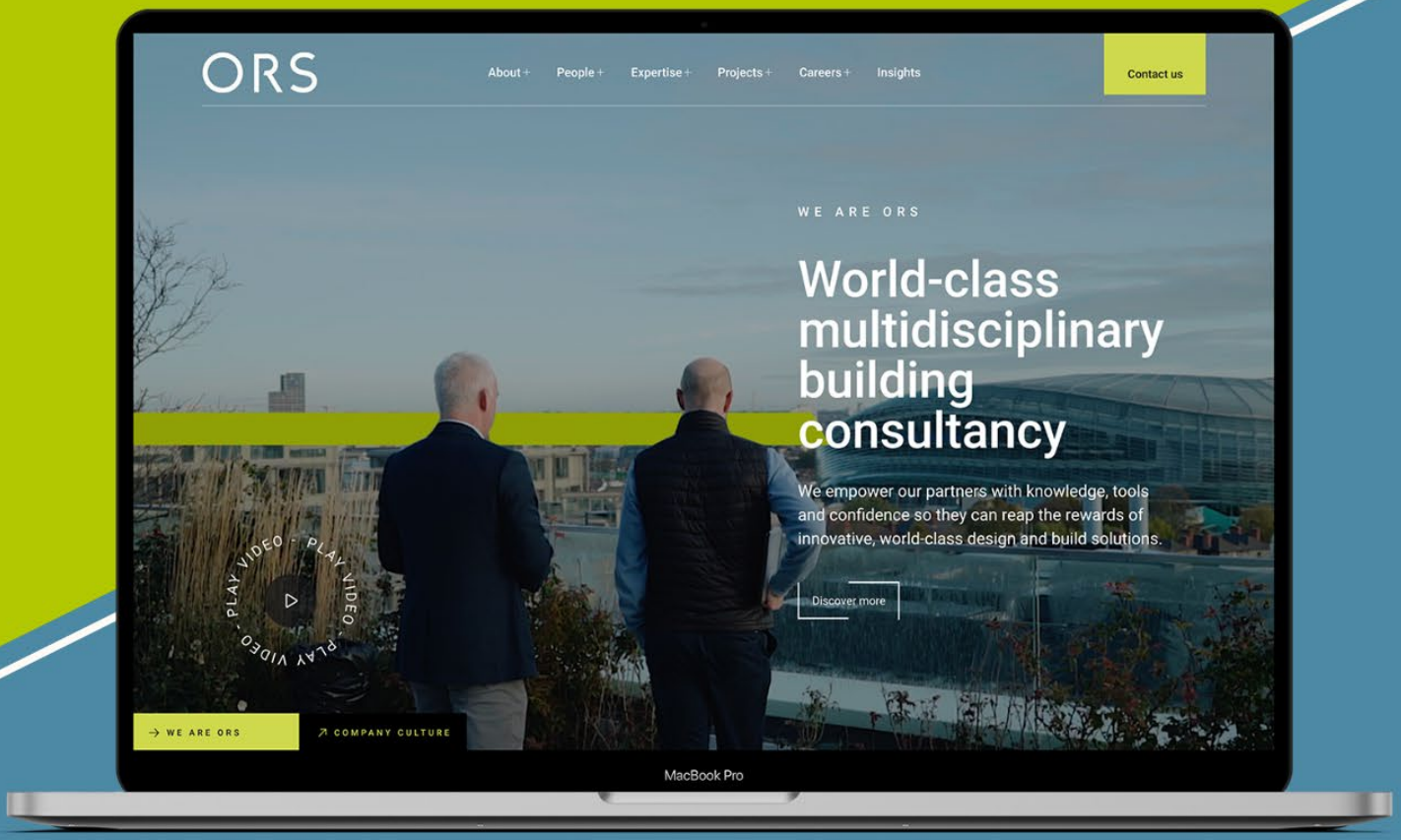

Find Us Nationwide, on LinkedIn or on Youtube

Block A,
Marlinstown Business Park,
Mullingar, Co. Westmeath,
Ireland, N91 W5NN

Suite: G04, Iconic Offices,
Harmony Row,
Dublin 2, Co. Dublin,
Ireland, D02 H270

Level One, Block B,
Galway Technology Park,
Parkmore, Co. Galway,
Ireland, H91 A2WD

Office 2, Donegal Town,
Enterprise Centre, Lurganboy,
Donegal Town, Co. Donegal,
Ireland, F94 KT35

Office 4, Spencer House,
High Road, Letterkenny,
Co. Donegal,
Ireland, F92 PX8N

NSQ2,
Navigation Square,
Albert Quay, Cork
Ireland, T12 W351