PURSER

Volume 2:

06

Description of the Proposed Development

6.0 Description of Proposed Development

6.1 Introduction

The applicant, Nua Bioenergy, proposes to construct a biomethane and bio-based fertiliser production facility at the former Lisheen Mine Site, Killoran, Moyne, Thurles, Co. Tipperary. This chapter of the Environmental Impact Assessment Report (EIAR) provides a detailed description of the proposed development, including its key components and processes. The development aims to support sustainable energy production through biomethane generation and bio-based fertiliser production, contributing to Ireland's renewable energy goals.

This chapter provides a description of the proposed development in accordance with Article 5(1)(a) of the 2011 EIA Directive, as amended by Directive 2014/52/EU. The directive requires information on *"the site, design, size, and other relevant features"* of the proposed development. It provides the basis against which the specialist assessments are undertaken. Note that specific details of the proposed development that are of relevance to particular specialist topics are also set out, where relevant, in the corresponding EIAR chapters.

6.2 Site Location and Context

The application site comprises part of the former Lisheen Mine complex, located in Killoran, Moyne, Thurles, Co. Tipperary. It is primarily bordered by other lands associated with the former mine to the north, south, and east, with agricultural land to the west.

Spanning approximately 5.5 hectares, the application site is classified as 'brownfield', having previously operated as a lead-zinc-silver mine until mining ceased in 2015. Since rehabilitation and levelling, which occurred between 2016 and 2018, the application site has remained largely vacant and is characterised by recolonised scrub and ground vegetation, with a mature hedgerow along its western boundary. The historic mine entrance, now sealed with concrete, is situated in the western part of the site, while the Cooleney Stream runs approximately 200 metres to the south.

A number of buildings exist in proximity to the application site, including the former Lisheen Mine maintenance depot (which has planning permission (TCC Reg. Ref. 211171) for redevelopment as the Irish Bioeconomy Foundation Research and Development Unit. A former office and laboratory building from the mine's operational period lies vacant near the site's western boundary, while AQS Environmental Solutions operates to the southeast of the site. Additionally, Revive Environmental's facility(permitted under TCC Reg. Ref. 21709) is currently under construction near the main entrance to the former Lisheen Mine site on the L5612 road.

The site is strategically positioned to ensure construction and operational traffic can access it via well-suited routes. HGV deliveries will use the L3201 and L4115 to travel between the site and M8 at Junctions 4, 5, and 6, which is the upgraded route previously used by Lisheen Mine traffic.

The surrounding area includes a mix of agricultural, residential, and industrial features. The Bruckana and Lisheen Mine wind farms are large-scale renewable energy projects situated on former industrial and boglands in County Tipperary, featuring a combined 42 wind turbines. The site is surrounded by extensive farmland, with low-density residential properties along nearby roads. The nearest residence is located approximately 750 metres to the west.

Please refer to **Volume 2:Chapter 3** for a more detailed description of the site location and context.

6.3 Need for the Proposed Development

The need for the proposed development is firmly established in relevant legislation, policy and guidelines as detailed in **Volume2: Chapter 4 (Legal and Policy Framework**). In summary, the proposed biomethane and bio-based fertiliser production facility at the former Lisheen Mine Site, with an annual intake of up to 98,000 tonnes of feedstock, is essential to meeting climate and renewable energy targets. The EU's Renewable Energy Directive (RED III, 2023) and REPowerEU strategies aim to increase biomethane production, reducing greenhouse gas emissions and reliance on imports. At a national level, Ireland's Climate Action Plan 2023 and the National Biomethane Strategy target 5.7 TWh of biomethane by 2030, to which this facility would significantly contribute.

Regionally, the Southern Region's RSES and the Tipperary County Development Plan 2022–2028 designate the Lisheen Mine site as part of a Decarbonisation Zone, encouraging bioeconomy and renewable energy projects that align with Ireland's climate objectives. The National Planning Framework supports such projects to transition to a low-carbon economy and promote sustainable development.

Beyond environmental benefits, this facility will support local economic resilience, creating jobs and providing farmers with new revenue streams. Situated in an ideal location, this project will align with EU, national, and local policies, helping to reduce emissions, improve energy security, and support sustainable rural development in Tipperary.

6.4 Description of the Proposed Development

Nua Bioenergy Limited intends to apply for permission to construct a biomethane and bio-based fertiliser production facility, with an annual intake of up to 98,000 tonnes of feedstock per annum, at this site of c. 5.5 hectares at lands located at the former Lisheen Mine Site, Killoran, Moyne, Thurles, Co. Tipperary.

The application site is principally bounded by: lands associated with the former Lisheen Mine to the north south and east; and by agricultural lands to the to the west.

The development will consist of the construction of an anaerobic digestion plant comprising:

a) 4 No. primary digester tanks (each measuring c. 7.6 m in height);
b) 3 No. secondary digester tanks (each measuring c. 14.5 m in height);

c) 4 No. feed hoppers;
d) 4 No. technical rooms (ranging in size from c. 35 sq m to c. 95 sq m GFA);
e) 2 No. biogas conditioning units;
f) process, storage and buffer tanks (comprising: 1 No. buffer digestate storage tank (c. 7.5 m in height), 1 No. suspension buffer tank (c. 8 m in height), 1 No. process area runoff storage tank (c. 4.5 m in height); 1 No. buffer digestate process tank (c. 4.5 m in height), 1 No. treated digestate liquids recycle storage tank (c. 4.5 m in height); 1 No. roofed liquids feed-mix tank (c. 3 m in height));
g) these components will be located within a containment bund constructed c. 3 m meters below ground level.

The proposed development will also consist of:

h) feedstock storage (comprising 3 No. storage clamps (c. 1,050 sq m in area each) and 2 No. storage sheds (c. 500 sq m GFA each));
i) a biomethane upgrading plant (including natural gas compression unit);
j) a biomethane loading facility (comprising a 4 No. loading bays with associated gates and safety features measuring c. 490 sq m in area);
k) a biomass boiler with its associated pellet storage silo (c. 12.5 m in height);
l) Combined Heat and Power (CHP) plant and associated heat exchanger;
m) a single storey bio-based fertiliser processing and storage unit (c. 3,890 sq m GFA) (including digestate dewatering plant, fertiliser pasteurisation plant and bio-based fertiliser loading facilities);
n) a single storey office building (c. 105 sq m GFA) (including offices, meeting room, control room, laboratory, welfare facilities, storeroom and a first-aid facility);
o) bin storage;
p) 9 No. car parking spaces (including 5 No. standard parking spaces, 2 No. electric vehicle (EV) spaces and 1 No. accessible car parking space);
q) electric vehicle (EV) charging infrastructure;
r) 10 No. bicycle parking spaces;
s) vehicular, cyclist and pedestrian access / egress and associated circulation routes;
t) 2 No. weighbridges;
u) a vehicle steam wash area; fuel storage tank and associated bund;
v) an emergency flare (c. 7.6 m in height);
w) a process area runoff lagoon;
x) an attenuation pond;
y) an ESB sub-station;
z) boundary treatments [including gates, piers and fencing];
aa) site lighting;
bb) all hard and soft landscaping;
cc) provision of sustainable urban drainage systems (SUDS); and
dd) all other associated site excavation, infrastructural and site development works above and below ground, including changes in level and associated retaining features, and associated site servicing [water and electricity supply].

An Industrial Emissions (IE) licence is required for the operation of this development under the provisions of the Environmental Protection Agency Act 1992, as amended. An application for this licence will be made to the Environmental Protection Agency (EPA). The proposed development will be classified as a Lower Tier COMAH establishment and therefore, falls under the requirements of the Control of Major Accident Hazards Regulations, 2015 (COMAH Regulations 2015).

(Please also refer to the **statutory notices** enclosed as part of the application.)

6.5 Proposed Site Layout

6.5.1 Design Approach

The site layout has been meticulously designed to address the site's constraints, deliver a functional and efficient facility, and ensure that the proposed development not only mitigates environmental impacts but actively enhances environmental quality and promotes biodiversity.

As detailed in Chapter 5 – Consideration of Reasonable Alternatives – the final design reflects multiple iterations and refinements. A significant constraint influencing the layout is the presence of a 110kV ESB overhead electricity transmission line, requiring a no-development buffer zone. The layout adheres fully to this exclusion zone, with the nearest structure positioned over 23 metres from the overhead cables, in compliance with ESB requirements.

The development layout was informed through proactive collaboration with the Design Team, integrating safety, functionality, and environmental considerations from outset.

6.5.2 Overview of the Proposed Site Layout

The proposed site layout has been designed with the anaerobic digestion plant at its core, serving as the central feature of the facility. (See **Figure 6.1.)** A largely 'one-way' circulation system surrounds the anaerobic digestion plant and its associated bund, facilitating the efficient movement of vehicles and personnel throughout the site.

To the south of the anaerobic digestion plant is the primary feedstock storage area, where solid and liquid materials are safely stored before being processed. Liquid feedstock is housed in a bunded storage area adjacent to the anaerobic digestion plant, ensuring compliance with safety and containment requirements.

North of the bunded area is the gas processing and loading facility, which handles the processing, compression, and distribution of biomethane. The energy building, situated to the west, houses essential backup power systems - a combined heat and power (CHP) unit - and a pellet boiler ensuring a reliable and renewable energy supply to support the anaerobic digestion process.

The centrally located control building provides oversight and management of the site's operations, ensuring optimal control and coordination. To the east of the site is the bio-based fertiliser processing and storage facility, completing the operational layout and ensuring smooth integration of all processes from feedstock input to product output.

Figure 6.1: Overview of the Proposed Site Layout. Source: Extract of Drawing No. 2429-DOB-XX-SI-DR-C-0500 P01, annotated by Purser to show key zones within the proposed site layout.

6.6 Site and Plant Components

Figure 6.2 below provides an annotated version of the Proposed Site Layout Plan, numbered to identify the key site and plant components proposed as part of the biomethane and bio-based fertiliser production facility. Detailed drawings showing design, layout and dimensions of components referenced are presented in the Planning Drawings that accompany this EIAR. (See also **Table 6.2** below.)

Figure 6.2: Overview of the Site and Plant Components. Source: Extract of Drawing No. 2429-DOB-XX-SI-DR-C-0500 P01, annotated by Purser to show key zones within the proposed site layout.

No.[1]	Component	Description	Refer to Drawing No.
01	Site Entrance	Site entrance from the existing internal access route comprising a c. 15 m wide, c. 2.4m high security gate.	2429-DOB-XX-SI-DR-C-0500 Site Layout Plan
02	Internal carriageway and hardstanding	Internal carriageway and hardstanding areas, constructed using concrete heavy duty surfaces providing suitable vehicle access route and turning areas for HGVs and agricultural and plant machinery.	2429-DOB-XX-SI-DR-C-1100 Proposed Typical Siteworks Details
03	Weighbridges	Weighbridge to record incoming feedstock delivery tonnages and outgoing bio-based fertiliser tonnages.	2429-DOB-XX-ZZ-DR-S-1400 General Details
04	Feedstock storage clamps	3 No. concrete-walled storage clamps used to store feedstocks, such as wholecrop silage. The feedstock is compacted and covered with a plastic tarp to maintain airtight conditions.	2429-DOB-XX-ZZ-DR-S-0300 Storage clamps plan, elevation and section
05	Feedstock storage sheds	2 No. feedstock storage sheds used for storing feedstocks such as broiler and horse manure, designed to control moisture and odours before processing.	2429-DOB-XX-ZZ-DR-S-0100 Storage Shed – Plan and 2429-DOB-XX-ZZ-DR-S-0101 Storage Shed - Elevations
06	Liquid feedstock storage tank	Liquid feedstock intake and storage, prior to feeding.	2429-DOB-XX-ZZ-DR-S-0810 Tank Farm - Tank Elevations
07	Hoppers	A hopper designed to receive feedstock and convey it directly into the primary digester for processing	2429-DOB-XX-ZZ-DR-S-1400 General Details and 2429-DOB-XX-ZZ-DR-S-0800 Tank Farm - Tank and Building Plans and Elevations
08	Primary Digester	A primary digester in an AD plant is a sealed tank where organic feedstock undergoes anaerobic digestion to produce biogas.	2429-DOB-XX-ZZ-DR-S-0800 Tank Farm - Tank and Building Plans and Elevations
09	Secondary Digester	A secondary digester is an additional tank in an anaerobic digestion process where partially digested material from the primary digester undergoes further breakdown. This stage enhances biogas yield and stabilises the digestate, making it safer for use as a fertiliser or soil conditioner	2429-DOB-XX-ZZ-DR-S-0800 Tank Farm - Tank and Building Plans and Elevations
10	Technical rooms	Technical rooms are facilities constructed between digester tanks to house essential operational components, including IT equipment, electrical systems, and plumbing.	2429-DOB-XX-ZZ-DR-S-0800 Tank Farm - Tank and Building Plans and

[1] (Please refer to Figure 6.2.)

No.[1]	Component	Description	Refer to Drawing No.
			Elevations and 2429-DOB-XX-ZZ-DR-S-0801 Tank Farm – Typical Stairs Detail
11	Biogas conditioning units	Biogas conditioning units are used to purify raw biogas by removing impurities like moisture, carbon dioxide, and hydrogen sulfide.	2429-DOB-XX-ZZ-DR-S-1400 General Details
12	Storage and buffer tanks	The storage and buffer tanks include several types, each with a specific purpose: a buffer digestate storage tank for holding digestate; a suspension buffer tank to regulate feedstock flow; a runoff storage tank for capturing process area drainage; a buffer digestate process tank for processing; and a treated liquids recycle tank for storing treated digestate.	2429-DOB-XX-ZZ-DR-S-0810 Tank Farm - Tank Elevations
13	Bund	The containment bund will be impermeable and provide the required storage volume (i.e., a minimum of 110% of the largest single tank volume).	2429-DOB-XX-SI-DR-C-0500 Site Layout Plan
14	Biogas upgrading plant	Biogas upgrading plant further refines the gas by separating out carbon dioxide (CO_2) to produce biomethane. This additional process increases the methane concentration, yielding high-purity biomethane suitable for injection into the natural gas grid or for use as a compressed renewable fuel.	2429-DOB-XX-ZZ-DR-S-0710 Biogas Upgrading Plant
15	Gas loading area	A gated gas loading area with four biomethane bays ensures controlled access for authorised personnel, with secure fencing, spill protection, and emergency shutoff systems	2429-DOB-XX-ZZ-DR-S-1200 Gas Filling Unit Plan and Elevations
16	Emergency Flare	An emergency biomethane flare safely burns off excess biomethane during operational upsets or shutdowns, preventing the release of unprocessed gas into the atmosphere.	2429-DOB-XX-ZZ-DR-S-0400 Biogas Flare General Arrangment
17	CHP and associated heat exchanger	A biomethane CHP (Combined Heat and Power) unit with an associated heat exchanger provides backup power for the AD facility by generating electricity and usable heat from biomethane, ensuring reliable energy supply during outages.	2429-DOB-XX-ZZ-DR-S-0700 Energy and CHP Plant Area Sheet 1
18	Biomass boiler	A biomass boiler heats water for the digestion tanks using renewable wood chip pellets stored in an associated silo, supporting sustainable energy needs for the facility.	2429-DOB-XX-ZZ-DR-S-0701 Energy and CHP Plant Area Sheet 2

No.[1]	Component	Description	Refer to Drawing No.
19	Bio-based fertiliser processing and storage facility	A bio-based fertiliser processing and storage facility separates digestate into liquids and solids using a screw press. The separated liquids are returned to the AD process, while the solid digestate is pasteurised to create bio-based fertiliser for agricultural use.	2429-DOB-XX-ZZ-DR-S-0600 and 0601 Bio-Fertilizer Processing and Storage Building
20	Attenuation Pond	An attenuation pond stores surface water runoff from non-process areas, such as roofs and roadways, where there's no risk of contamination from facility operations. This pond ensures the clean, uncontaminated water is safely managed and released gradually to reduce flooding risks.	2429-DOB-XX-SI-DR-C-0200 SW Layout Plan and 2429-DOB-XX-SI-DR-C-0260 Pond Sections
21	Process area run-off lagoon	A process area runoff lagoon collects surface water from areas where it might come into contact with organic materials from facility operations. Although not typically contaminated, this water is managed separately to ensure safe handling and environmental protection	2429-DOB-XX-SI-DR-C-0200 SW Layout Plan and 2429-DOB-XX-SI-DR-C-0260 Pond Sections
22	Car park	Car park providing 9 No. car parking spaces for staff and visitors.	2429-DOB-XX-SI-DR-C-0500 Site Layout Plan
23	Bicycle parking	10 No. bicycle parking spaces.	2429-DOB-XX-SI-DR-C-0500 Site Layout Plan
24	Office	A single-storey office building including offices, a meeting room, a control room, laboratory, welfare facilities, a storeroom, and a first-aid facility, supporting operational and administrative needs for the facility. External staff amenity areas are also provided.	2429-DOB-XX-ZZ-DR-S-0500 Office Building Plan and Elevations
25	Landscaped areas	Landscaped areas in the facility will use native species like willow, encourage natural recolonisation with minimal soil disturbance, and focus on habitat connectivity.	PL0001 – P01
26	SuDS swales	SuDS swales are shallow, vegetated channels that capture and slowly convey surface water runoff, filtering pollutants and promoting natural infiltration to manage water sustainably.	2429-DOB-XX-SI-DR-C-0200 SW Layout Plan and 2429-DOB-XX-SI-DR-C-0255 Typical SuDS Details
27	ESB substation	An ESB substation converts and distributes electrical power from high to lower voltages for safe delivery to the facility.	2429-DOB-XX-SI-DR-C-0500 Site Layout Plan
28	Boundary treatments	A 2.4-meter high mesh and stock-proof fencing will be installed along site boundaries to maintain security and prevent unauthorised access.	PL0002 – P01

Table: 6.1: Key Site and Plant Components.

6.7 Overview of Construction Phase and Construction Works

For full construction related details, please refer to the Construction Management Plan (CMP) prepared by Donnachadh O'Brien Consulting Engineers (Ref. 2429-DOB-XX-SI-RP-C-0003) dated October 2024 and enclosed as part of the Planning Application. A summary is provided below.

6.7.1 Construction Phase and Works

It is envisaged that the construction of the proposed development shall be a single-phased construction program, involving sub-phases / workflow events as follows:

Phase	Sub-Phase	Description	Duration
1	1.1	Site set-up and compound / access.	1 month
	1.2	Construction of Process Area Run-off Drainage Lagoon (acting as temporary settling pond during construction) .	1 month
	1.3	Construction of new development buildings, plant, car park and set down area and all external hardstanding and infrastructure.	18 months

Table 6.2: Proposed Duration and Sequencing. Source: Construction Management Plan, prepared by Donnachadh O'Brien Consulting Engineers (Ref. 2429-DOB-XX-SI-RP-C-0003) dated October 2024 and enclosed as part of the Planning Application.

6.7.1.1 Phase 1.1

Phase 1.1 will take approximately 1 month and the following sections describe the main activities that are planned to be undertaken during this phase.

a) Site Set up

- Site set up for the construction compound and erection of secure site hoarding and fencing around the site
- Implementation of Contractor's Health & Safety Plan for the enabling works.
- Identification and cut-off, as required, to existing services. It is not anticipated that any services would require these due to the brownfield unused condition of the current lands.
- Create contractor access points off the unnamed private road. This is proposed to be the same access as per the permanent scenario.

6.7.1.2 Phase 1.2

Phase 1.2 will take approximately 1 month and the following sections describe the main activities that are planned to be undertaken during this phase.

- Primary dig of temporary settling pond to a depth of permanent lagoon.
- Implementation and installation of mitigation measures.
- Temporary storage of cut material to be reused for fill.
- Liaising with Local Authority Drainage Department as required.

6.7.1.3 Phase 1.3

Phase 1.3 will take approximately 18 months and the following sections describe the main activities that are planned to be undertaken during this phase:

a) Foundation Excavation

- Excavation of Building Foundations.
- Stockpiling of site-won material and appropriate temporary covering.
- Removal of surplus excavated material and storing of same at appropriate location.
- Placement of site-won material in areas at grade for build-up in site levels and as backfill to substructure, if appropriate for re-use. Lime stabilization to be used for areas under buildings and roads.

b) Construction

- Construction of in-situ reinforced concrete Ground Floor Slabs, requiring temporary formwork and
- propping.
- Installation of in-situ concrete vertical elements including columns, reinforced concrete walls.
- Construction of load-bearing masonry internal and external walls.
- Erection of perimeter scaffolding until the external envelope is complete.
- Completion of external envelope which comprises masonry construction and sheeting.
- Upon completion of the external envelope and the scaffolding removed, the construction of all new site service connections will commence including new Surface Water, Wastewater, Water supply, Electricity, Telecoms and Data.
- Construction of external site works including footpaths, internal roads.
- Installation of building M&E services.
- Installation of the internal fit out comprising partition as required.
- Construction of sub-bases to roads & footpaths at grade.
- Construction of hard and soft landscaping.

6.7.2 Construction Working Hours

The proposed normal working hours, subject to Planning Permission, during the construction phase are detailed in Table 6.3 below:

Start	Finish	Day
08:00	18:00	Monday to Friday
08:00	14:00	Saturday

Table 6.3: Proposed Construction Working Hours. Source: Source: Construction Management Plan, prepared by Donnachadh O'Brien Consulting Engineers (Ref. 2429-DOB-XX-SI-RP-C-0003) dated October 2024 and enclosed as part of the Planning Application.

No works are proposed on Sundays or Bank Holidays or after the hours noted above. However, it may be necessary to work outside of these hours in exceptional circumstances such as Night Works or Weekend Works during certain construction activities. If such circumstances arise, the relevant authorities will be notified in advance.

6.7.3 Site Access and Egress

The Contractor will establish a site boundary with the provision of appropriate signage, construction of hoarding, and welfare facilities, site office, and establishment of appropriate access and egress. The construction site hoarding will be provided as a secure site boundary to what can be a dangerous environment for people who have not received the proper training and are unfamiliar with construction operations established around the work area before any significant construction activity commences. Site hoarding minimises some of the potential environmental impacts associated with construction, namely:

- Noise,
- Visual impact,
- Dust.

Controlled access points to the site, in the form of gates or doors, will be kept locked for any time that these areas are not monitored (e.g. outside working hours). The hoarding shall be painted, well maintained and contain graphics relating to the proposed development.

6.7.4 Construction Compound

The contractor's construction compound will be located on site[2] for the duration of the project and shall primarily consist of:

[2] Please refer to Figure 3 of the Construction Management Plan, prepared by Donnachadh O'Brien Consulting Engineers (Ref. 2429-DOB-XX-SI-RP-C-0003) dated October 2024 which illustrates the extent of the proposed construction compound.

- Site Offices & associated welfare facilities,
- Car Parking facilities,
- Materials drop-off and storage areas;
- Set down areas for HGVs

Materials to be stored on site will be stored in a safe manner and will minimise the risk of any negative environmental effects and will be managed on a 'just-in-time' basis. All fuel storage areas will be bunded in the compound and will be clearly marked. Fuel will be transported from the offsite compound to the plant and equipment in mobile units based on need. A dedicated fuel filling point will be set up on site with all plant brought to this point for filling. Temporary toilets and wash facilities will be provided for construction workers which may require periodic waste pumping and waste offsite haulage and shall be carried out by an authorised sanitary waste contractor.

6.7.5 Construction Traffic

6.7.5.1 Construction Traffic Routes

The site is strategically positioned to ensure construction traffic can access it via well-suited routes. The nearest primary road infrastructure includes direct access from the M8 at Junctions 4, 5, and 6. All HGV construction traffic shall follow the same designated routes in place for all other construction traffic. The proposed Routes are:

- To / from the north-east via the L4115, L3201, R639 and M8 J4; and
- To / from the south-west via the L4115, L3201, R630 and M8 J6.

The L3201 and L4115 were previously used as the HGV route between the Lisheen Mine and the R639. To support operations, a right-turn lane was added to the R639 at its junction with the L4115, and both the L4115 and L3201 were improved. The R639, L4115 and L3201 are of suitable width and alignment to accommodate two-way HGV traffic, and currently experience low traffic flows.

The route between the site and the R639 is currently lightly trafficked, and passes through a semi-rural area, with no particularly sensitive receptors. To reach the M6, HGVs will either travel north-east to Junction 4, or south-west to J6. These sections of the delivery route pass through Urlingford and Littleton. The speed limit within these settlements is 50km/h, and construction traffic can be accommodated safely, and without noticeably affecting existing traffic levels.

The details of the proposed construction routing will be agreed with TCC, prior to commencement of construction works.

6.7.5.2 Construction Traffic Generation

It is expected, based on the current project phasing, that during peak construction activities, the site will generate 20 HGV two-way movements per day. This peak is anticipated during the early excavation and initial substructure works. Outside of this period, HGV movements will reduce to an average of around 6 two-way trips per day.

Construction traffic will follow designated routes via the L3201, L4115, and R639, minimising any short-term impact on surrounding residential areas. All routes have been previously used for similar HGV volumes and are suitable for two-way HGV traffic, as assessed in collaboration with Tipperary County Council (TCC).

Traffic impacts during the construction stage will be mitigated through the implementation of a Construction Traffic Management Plan (CTMP), which will be agreed with TCC. SYSTRA has prepared a **Framework Traffic Management Plan**, which forms part of the wider Construction Management Plan, which has been prepared by Donnachadh O'Brien Consulting Engineers (Ref. 2429-DOB-XX-SI-RP-C-0003), and forms part of the wider Application.

This plan will evolve in consultation with the Design Team, Tipperary County Council (TCC) and with An Garda Siochana, and shall be updated, as required, throughout the project.

6.7.6 Employment

It is anticipated that at the peak of the construction phase, there will be an average workforce of 20 No. people.

6.7.7 Health and Safety

The Contractor shall comply with the requirements of the Safety, Health and Welfare at Work Act 2005, the Safety, Health and Welfare at Work (Construction) Regulations, 2006 and other relevant Irish and EU safety legislation at all times. As required by the Regulations, a Health and Safety Plan will be formulated to address health and safety issues from the design stages through to completion of the construction and maintenance phases. This plan will be reviewed and updated as necessary as the development progresses. In accordance with the Regulations, a 'Project Supervisor Construction Stage' will be appointed as appropriate. The Project Supervisor Construction Stage will assemble the Safety File as the project progresses.

6.7.8 Construction Waste

The Contractor will produce a Construction Waste Management Plan (CWMP) which will be submitted to Tipperary County Council for approval prior to commencing the works. The Contractor will refer to and expand on the Construction Management Plan, prepared by Donnachadh O'Brien Consulting Engineers (Ref. 2429-DOB-XX-SI-RP-C-0003) dated October 2024 and include the following:

- Description of the Project and details of the Contractor's Construction Waste Manager.
- Construction Waste Arising and proposals for waste minimisation, reuse and recycling.
- Procedures for waste prevention and management.
- Estimated costs of waste management.
- Training and education proposals for the workforce regarding Construction and Demolition (C&D) Waste procedures.
- Waste collection and disposal including licensing, permits and associated records
- CWMP Auditing.

6.7.9 Environmental Management during Construction

The Construction Management Plan, prepared by Donnachadh O'Brien Consulting Engineers (Ref. 2429-DOB-XX-SI-RP-C-0003) dated October 2024 outlines comprehensive measures to mitigate potential environmental impacts during the construction phase. Key mitigation steps include implementing a Construction Traffic Management Plan, reducing dust emissions through regular watering of exposed areas, controlling vehicle speeds, and conducting air quality monitoring to ensure minimal disruption. Additional protocols address water quality, including runoff controls and secure storage for hazardous materials, to prevent contamination of nearby water sources. Waste management practices will ensure the minimisation, reuse, and recycling of materials, with regular waste audits to track compliance. Emergency response measures are also in place to handle any accidental spills or other environmental incidents promptly.

6.8 Operational Phase - Process and Design Description

6.8.1 Overview

6.8.1.1 Anaerobic Digestion - An Overview

Anaerobic Digestion (AD) is a natural biological decomposition process which takes place in an oxygen-free environment, where micro-organisms (bacteria and archaea) break down organic matter. There are four main stages to this process:

- **Stage 1: Hydrolysis** - large, complex polymers like carbohydrates, cellulose, proteins, and fats are broken down by hydrolytic enzymes into soluble monomers i.e., amino acids from proteins, long chain fatty acids from lipids, and simple sugars from complex carbohydrates.

- **Stage 2: Acidogenesis** – these soluble monomers are further broken down into short chain volatile fatty acids (VFAs), alcohols, carbon dioxide and hydrogen.

- **Stage 3: Acetogenesis** - the products of acidogenesis are broken down into acetate, releasing hydrogen and carbon dioxide.

- **Stage 4: Methanogenesis** – In this final stage of AD, various groups of methanogenic bacteria consume acetate, hydrogen and carbon dioxide and convert these intermediate products into CH4.

The biological decomposition stages are illustrated in **Figure 6.3.**

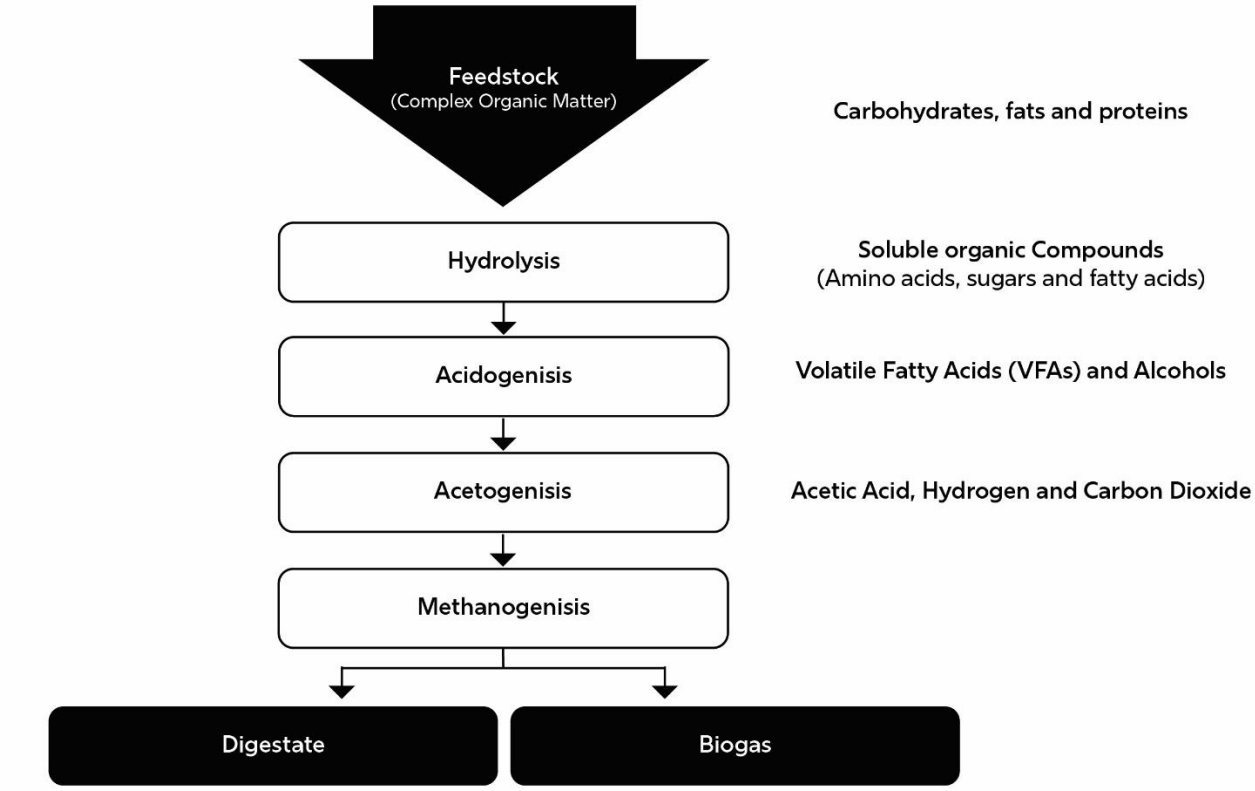

Figure 6.3: An overview of the AD Process (including biological decomposition stages).

6.8.1.2 Feedstock

The proposed development has been designed to accept and treat up to 98,000 tonnes per annum of predominantly locally sourced agricultural manures, food processing sludges and crop-based feedstocks. The estimated feedstock composition and annual tonnages accepted are outlined in Table 6.4 below. The feedstock intake profile is indicative and subject to change based on market and season conditions and availability and quality of feedstocks. However, notwithstanding the above the overall feedstock intake will not exceed 98,000 tonnes per annum.

Feedstock	Tonnes per Annum	Percentage of Total
Whole crop Silage	8,000	8.16%
Farmyard Manure	30,000	30.67%
Bellygrass Sludge	30,000	30.61%
Dairy Sludge and Dewatered Manure	15,000	15.31%
Broiler Manure	15,000	15.31%
TOTAL	**98000**	**100.00%**

Table 6.4: Feedstock Profile. Source: Nua Bioenergy, 2024.

The proposed development at Lisheen is ideally located to optimise feedstock sourcing and bio-based fertiliser distribution. All feedstocks will be sourced locally within County Tipperary and will be transported from within a one-hour travel radius, with the site centrally positioned between feedstock suppliers. This strategic location enables efficient use of the M8 Motorway and key regional roads, minimising transport times and ensuring no adverse impact on local road infrastructure.

6.8.1.3 Bio-Based Fertiliser

The proposed development will generate bio-based fertiliser, which will be applied to the farmland from which the feedstocks were originally sourced. This practice enhances soil quality and reduces the dependency on chemical fertilisers, effectively closing the nutrient loop by returning essential nutrients to the land. To maximise environmental efficiency, trucks delivering feedstocks to the AD facility at Lisheen will return with loads of bio-based fertiliser. Below, we outline the locations of feedstock sources that will also receive this bio-based fertiliser.

The location of feedstock suppliers and receivers of bio-based fertiliser is illustrated in **Figure 6.4** below.[3]

No.	Type of Feedstock	Bio-Based Fertiliser Receiver
1	Dairy sludge and whey permeate. Quantity: c. 15, 000 tonnes per annum.	No.
2	Whole crop Silage Quantity: c.2,000 tonnes per annum.	Yes.
3	Whole crop Silage Quantity: c.2,000 tonnes per annum.	Yes.
4	Whole crop Silage Quantity: c.2,000 tonnes per annum.	Yes.
5	Farmyard manure. Quantity: c.30,000 tonnes per annum.	Yes.
6	Slaughterhouse bellygrass. Quantity: c. 30,000 tonnes per annum.	No.
7	Whole crop Silage Quantity: c.2,000 tonnes per annum.	Yes.

Table 6.5: Feedstock Suppliers and Digestate Receivers. Source: Nua Bioenergy, 2024.

[3] Please note that the exact locations of feedstock suppliers are commercially sensitive. However, in our professional opinion, the level of detail provided is sufficient for the competent authority to conduct an assessment in accordance with relevant legislation and guidelines.

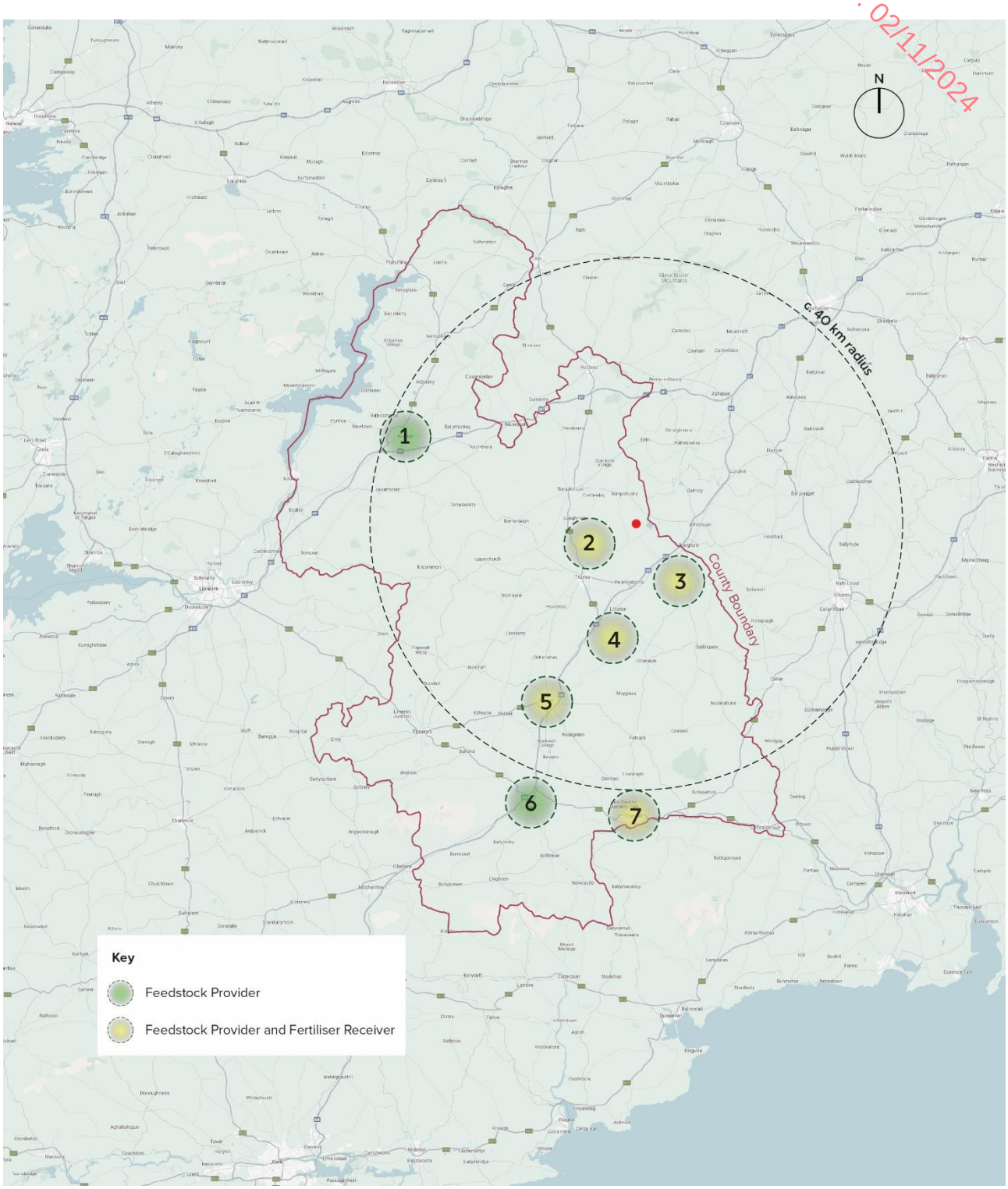

Figure 6.4: Location of key Feedstock Providers and Receivers of Bio-Based Fertiliser. Source: Nua Bioenergy, 2024.

6.8.1.4 Biogas

Biogas is the product of this complex biological decomposition of organic materials, mainly consisting of 55-70% by volume methane (CH4), 30-45% carbon dioxide (CO2), together with traces of other gases, i.e., nitrogen (N2), hydrogen (H2), hydrogen sulphide (H2S), ammonia (NH3), as well as water vapour. The exact composition of biogas is dependent on the type of feedstock being digested.

Biogas can be 'upgraded' to pure methane, often called biomethane, by removing CO2, H2S, moisture and other trace gases. This upgrading process yields a high-purity stream of biomethane, which can then be injected into the natural gas grid or used by a variety of energy applications, such as vehicle fuel, industrial heating, or renewable power generation.

Based on the feedstock composition and design operating capacity, it is projected that the facility will be capable of producing 1,120 M3 of biomethane per hour.

The Lisheen AD facility is strategically positioned to supply biomethane to major potential customers, including Gas Networks Ireland and Flogas (see Letters / Expressions of Interest from Gas Networks Ireland and Flogas enclosed as part of the planning application), alongside other significant users such as large industries, multinational corporations, pharmaceutical companies, and transport and logistics businesses. While it is not feasible to identify all potential customers at this stage, it is anticipated that biomethane will be injected into the Central Grid Injection (CGI) points at Mitchelstown and the private grid injection facility at Cush in County Kildare. The Lisheen site is centrally located between these grid injection points, ensuring efficient delivery and broad access to key distribution networks. (See **Figure 6.5** below.)

The site's proximity to the M8 Motorway significantly enhances its logistical advantages, providing swift and effective transportation routes for biomethane distribution and enabling seamless access to diverse customer bases across the region. This location optimises distribution efficiency, supports regional connectivity, and ensures a reliable supply route, making the Lisheen site an ideal location for serving a wide range of potential biomethane customers effectively.

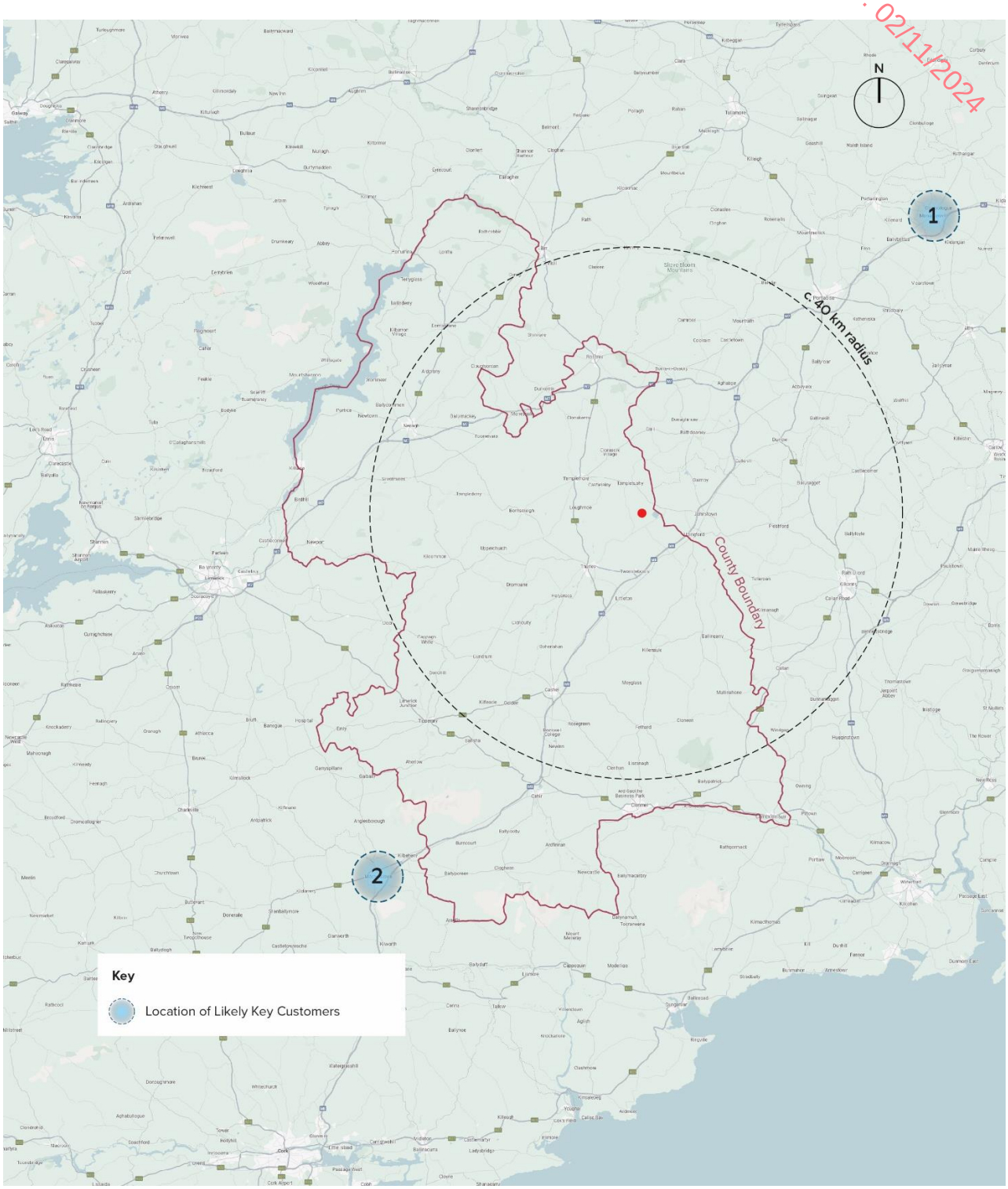

Figure 6.5: Location of potential key Customers. Source: Nua Bioenergy, 2024.

6.8.2 Description of Site Design and Processes

The key processes and design details are described in detail in the following sections. **Figure 6.6** provides a Process Diagram.

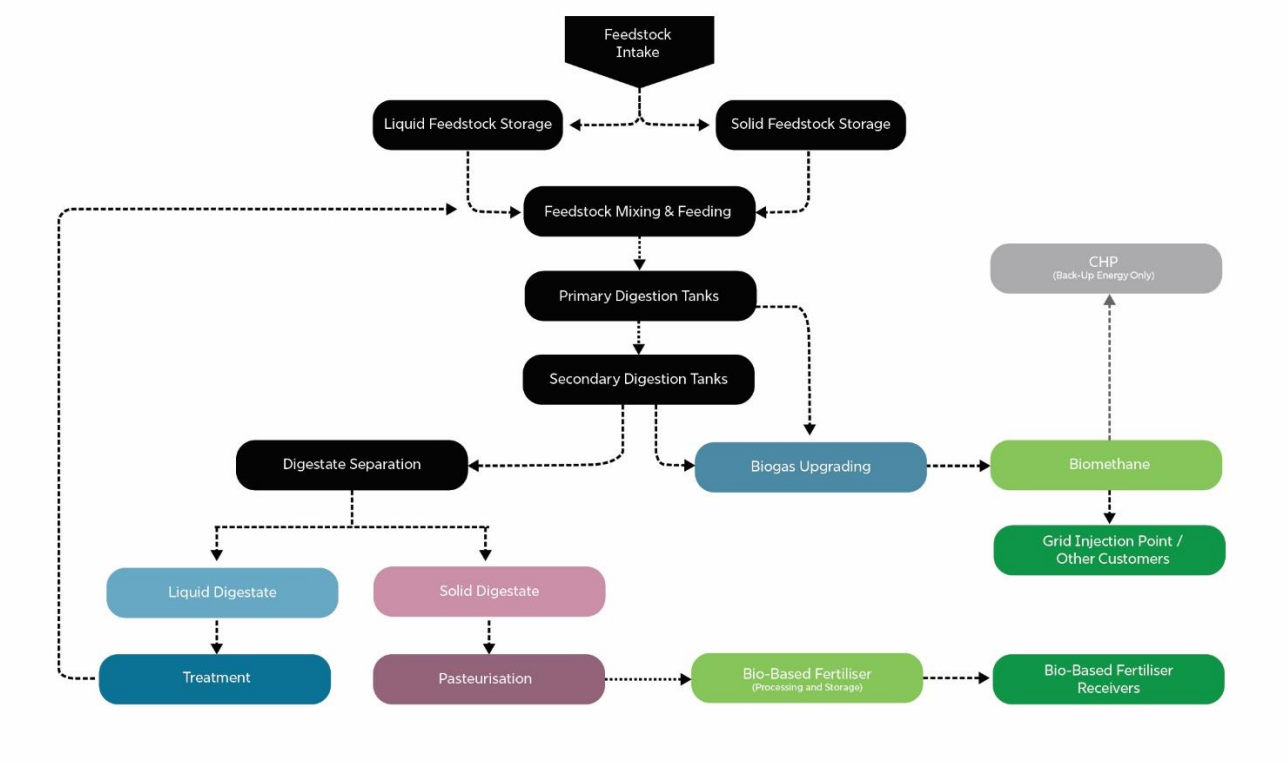

Figure 6.6: Process Flow. Source: Nua Bioenergy.

6.8.2.1 Feedstock Acceptance and Storage Procedure

Feedstocks will be transported to the proposed facility using heavy goods vehicles (HGVs) equipped with enclosed trailers and sealed vacuum tankers, ensuring safe and secure transit.

Only feedstocks meeting stringent acceptance criteria and fully compliant with Environmental Protection Agency (EPA) and Department of Agriculture, Food and the Marine (DAFM) licence conditions will be accepted on-site. All suppliers must complete a Feedstock Acceptance Agreement (FAA) prior to delivery.

Upon arrival, each feedstock delivery will be weighed and logged at the weighbridge near the site entrance, adhering to EPA and DAFM regulatory requirements. The weighbridge, made of steel and mounted on load cells in a reinforced concrete pit, is integrated with an automated data management system for accurate record-keeping.

Following weighing, haulier drivers will proceed to the office to review and submit all required commercial documentation for feedstock transport. A visual inspection of the feedstocks will then be conducted to ensure conformity with FAA standards.

Once approved, feedstock will be unloaded as follows:

- Whole crop feedstocks will be stored in concrete-walled and floored clamps, where they are compacted and covered with a plastic tarp to create an airtight seal.
- Equine, farmyard, and broiler manure will be housed in storage sheds specifically designed to manage moisture levels and odour control prior to processing.
- Liquid feedstocks will be pumped into a dedicated liquid feedstock tank within a bunded area to prevent leakage and ensure safe storage.

These measures ensure the secure handling, storage, and compliance of all feedstock materials upon arrival and during storage.

6.8.2.2 Site Access and Circulation

The site layout is designed to ensure efficient, safe, and regulatory-compliant circulation for all vehicle movements, with a primarily 'one-way' flow surrounding the anaerobic digestion (AD) plant at the centre of operations. This layout enables smooth transitions between feedstock delivery, processing, cleaning, and product loading.

Feedstock Delivery and Bio-Based Fertiliser Loading

- Truck Arrival and Feedstock Unloading
  Trucks delivering feedstock enter through the main gate and are directed to the weighbridge for initial weighing. After weighing, trucks proceed to designated unloading areas near the feedstock storage, located south of the AD plant. Here, both solid and liquid feedstocks are stored before processing in a bunded area adjacent to the AD plant.

- Cleaning and Regulatory Compliance
  After unloading, trucks move around the AD plant to the steam wash area, ensuring compliance with Department of Agriculture regulations for cleanliness. This cleaning step helps prevent contamination and adheres to required safety standards for agricultural and food-related transport.

- Post-Cleaning Weighing and Fertiliser Loading
  Once cleaned, trucks proceed to weighbridge No. 2 for a secondary weighing. Trucks then move to the bio-based fertiliser loading area, located to the east of the site. Here, an overhead auger system loads the trucks with processed fertiliser, automatically weighing the product to ensure accurate delivery.

- Exit Route
  After loading, trucks follow the circulation route back to the main gate, exiting the site in a controlled, streamlined manner.

Biomethane Trailer Loading

- Trucks collecting biomethane trailers enter through the main gate and proceed directly to the gas loading area north of the AD plant. They typically arrive with an empty trailer, which is unhitched and replaced by a full trailer for delivery. The gas loading area is designed to facilitate quick hitching and unhitching, ensuring an efficient rotary loading process for biomethane distribution.

This circulation system not only enhances operational efficiency but also ensures the safe and compliant movement of vehicles, feedstocks, and products, with each step closely integrated into the site layout.

Staff and Visitor Access

Staff and visitors will enter the site through the main gate, following clear signage directing them to the designated parking area. This area is separate from all plant and truck operations, providing a safe environment for exiting vehicles and parking bicycles. Located adjacent to the office and control room, this area ensures easy access for staff and visitors to report and sign in upon arrival, supporting site safety and compliance procedures.

The below Figures illustrates the incoming movements (green) and outgoing movements (blue) of the delivery trucks. Please refer to Drawing Nos. 2429-DOB-XX-XX-Si-DR-C-0700 and 2429-DOB-XX-XX-Si-DR-C-0701 enclosed as part of the planning application, which outline the vehicular flow and swept path analysis.

Importantly, the figures below provide two separate drawings : **Figure 6.7** outlines the movements associated with feedstock delivery and acceptance and loading of bio-based fertiliser. **Figure 6.8** outlines the vehicle movements for HGVs collecting biomethane for distribution.

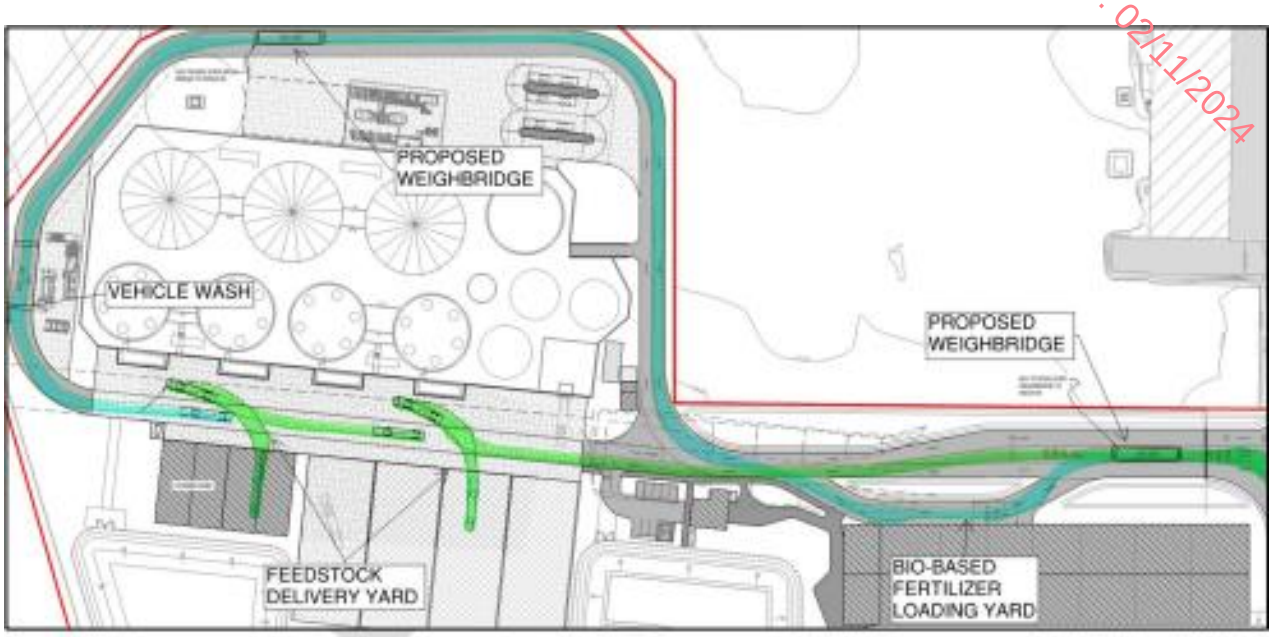

Figure 6.7: Vehicle movements associated with feedstock delivery and acceptance and loading of bio-based fertiliser.. Source DOBA.

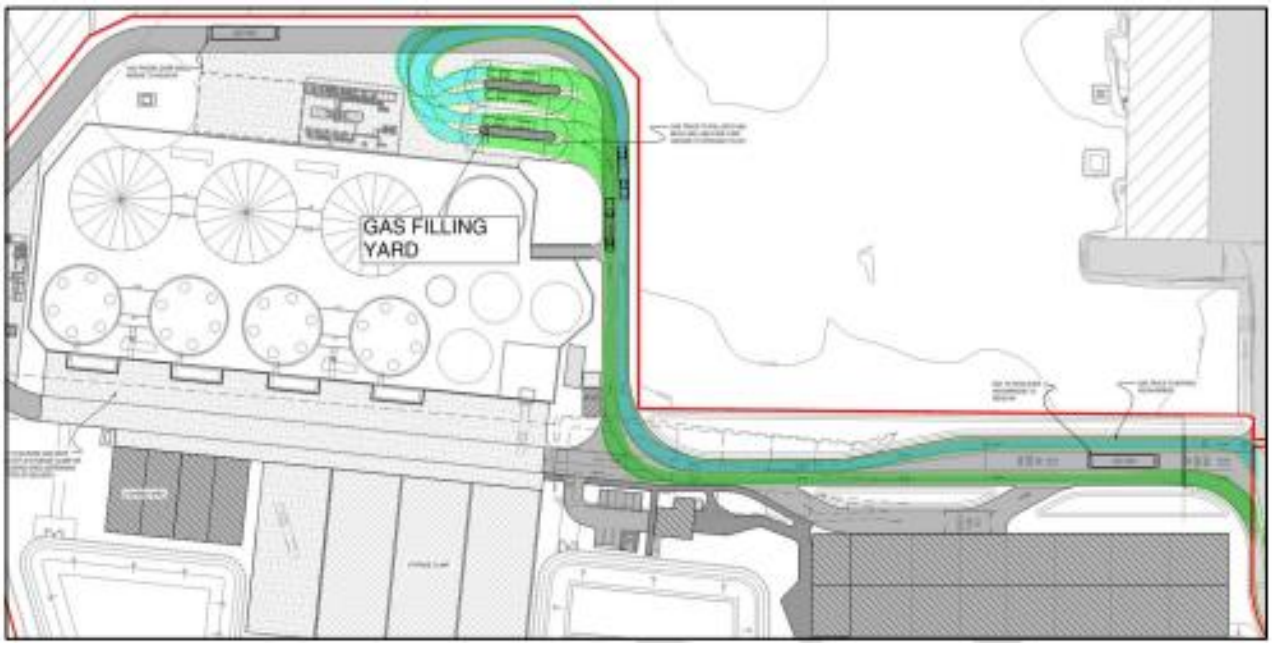

Figure 6.8: Vehicle movements for collection of biomethane for distribution. Source: DOBA.

6.8.2.3 Anaerobic Digestion

The anaerobic digestion process includes the following steps:

1) Feeding – A staff member loads solid feedstocks into hoppers using a loading shovel, while liquid feedstocks are pumped directly into the primary digester.

2) Primary Digestion – In this initial stage, feedstocks undergo microbial breakdown in the primary digestion tanks, where active mixing facilitates optimal biogas production.

3) Secondary Digestion – Partially digested material is transferred to the secondary tanks for further stabilisation, biogas capture, and preparation of the digestate for use as bio-fertiliser.

This process is continuous. Detailed descriptions of the primary components and operations are provided below.

Feeding System / Hoppers

The hopper system is designed to store and process substantial quantities of solid biomass feedstock for transfer into the digester. Four hoppers are designated to feed each of the four primary digesters, all located within a bunded, contained area below ground level to facilitate convenient access and loading. Feedstock is loaded into each hopper using a wheel loader and then moved through an automated conveying system. This system feeds the digesters at set intervals, regulated by the AD plant's automated control system.

Primary Digestion Tanks

The primary digestion tanks are prefabricated, high-quality concrete structures optimised for efficient anaerobic digestion of agricultural waste, including manure with high straw content and energy crops with high dry solid content. Each tank is constructed from pre-cast elements with a reinforced concrete ceiling and central column to ensure durability. The tanks measure approximately 8.0 meters in height, 23.0 meters in internal diameter, and have a gross volume of around 3,300 m^3.

In this phase, microbial activity breaks down the feedstocks, aided by a robust vertical paddle agitator that prevents sedimentation and maintains ideal conditions for biogas production. The sloped reinforced concrete base promotes effective mixing and ensures an even distribution of microbial populations throughout the tank.

Secondary Digestion Tanks

The secondary digestion tanks provide a vital stage following primary digestion, focusing on stabilising and refining the digestate while capturing additional biogas. Larger than the primary tanks, each secondary tank has an internal diameter of about 29.4 meters, a height of 8.0 meters, and a volume of approximately 5,420 m^3.

Constructed from pre-cast concrete on a sloped reinforced base, the secondary tanks are fitted with a double-membrane gas storage dome. This dome includes an inner and outer PVC-coated membrane; the outer membrane maintains low-pressure air at a slightly higher pressure than the biogas inside the inner membrane, facilitating smooth gas flow to the Biogas Conditioning Unit and managing fluctuations in biogas production.

Unlike primary tanks, which prioritise active digestion, secondary tanks focus on digestate maturation and biogas storage. An adjustable shaft mixer within the tank prevents floating layers by homogenising the digestate, while the double-membrane holder temporarily stores any additional biogas. This setup ensures efficient post-digestion processing, stabilising the digestate and optimising biogas yield, while producing high-quality, nutrient-rich bio-fertiliser for agricultural use. (Note: the primary and secondary digester gas systems are linked with gas storage only in the secondary digesters.)

6.8.2.4 Biogas conditioning and upgrading

The biogas produced through anaerobic digestion contains methane (CH_4), carbon dioxide (CO_2), hydrogen sulphide (H_2S), nitrogen (N_2), oxygen (O_2), and trace components such as volatile organic compounds (VOCs). For the biogas to be used effectively, impurities and non-useable gases need to be removed. This process occurs at the biogas conditioning unit, and the biogas upgrading plant, each of which performs distinct steps in refining the biogas.

Biogas Conditioning Unit

The conditioning unit is a plant component located within the bund that pre-treats the raw biogas by removing water, H_2S, and other contaminants. Initial steps include cooling the biogas to condense moisture and filter out particulates. Activated carbon filters remove further impurities, including H_2S, ammonia (NH_3), VOCs, and siloxanes, protecting downstream equipment and improving gas quality.

Biogas Upgrading Plant

The biogas upgrading plant is located just north of the bund. It refines the conditioned gas by separating methane from CO_2 and other remaining components using advanced membrane technology. The biogas is compressed to facilitate membrane filtration, which, in turn, separates CO_2 and any residual water from methane. This process increases the methane concentration, lowering the gas's dew point to around -60°C. After quality control, the biomethane is ready for conversion to a compressed natural gas (CNG).

6.8.2.5 Biogas loading for distribution

The biogas loading area is a gated, secure zone with four loading bays for biomethane trailers, facilitating a continuous, efficient loading operation. While one trailer is being filled with compressed biomethane, another trailer can be positioned for loading in a rotary system. This approach maximises efficiency, minimises waiting times, and maintains a steady flow of gas for distribution.

Access to the loading area is strictly controlled, with secure fencing, spill containment systems, and emergency shut-off mechanisms in each bay to ensure safety. The biomethane is compressed before loading, allowing for optimal storage capacity within each trailer. This setup adheres to safety standards, supporting a safe, streamlined process for biomethane loading and distribution

6.8.2.6 Digestate Processing

Digestate processing involves using a dewatering system that uses a liquid/solid screw press (located within the Bio-Based Fertiliser Processing and Storage Unit) to separate the digestate into liquid and solid components. The extracted water from this process is returned directly to the anaerobic digestion (AD) system following treatment, ensuring no external discharge. After separation, the water is pumped to a treated digestate liquids recycle storage tank, where it is stored before being reintroduced into the feed mix. This closed-loop system enhances resource efficiency and maintains environmental standards.

6.8.2.7 Bio-Based Fertiliser Processing and Storage

The solid digestate from the dewatering process undergoes pasteurisation to produce a stable, bio-based fertiliser suitable for agricultural use, in accordance with EU and Animal By-product (ABP) Regulations. This process takes place in a dedicated pasteurisation plant within a single-storey bio-based fertiliser processing and storage unit. Once pasteurised, the fertiliser is moved to storage. The facility includes a conveyor system that enables efficient and spill-free loading of trucks for distribution, ensuring safe handling and transport of the bio-based fertiliser to end-users.

The proposed bio-based fertiliser storage unit has the capacity to store 10,000 m3 of product. The facility will provide c. 3 weeks storage for bio-based fertiliser on-site but unlike liquid digestate, the solid compost can be stored on field margins during close period, similar to farmyard manure.

6.8.2.8 Biomass Boiler

The Biomass Boiler (500 kW) is a high-efficiency heating system designed for continuous and automated operation, capable of generating the necessary heat for the anaerobic digestion (AD) process. Located to the west of the bund, this biomass boiler is paired with a dedicated wood chip/pellet storage silo (c. 12.5 m in height),

ensuring a consistent and reliable fuel supply. The boiler system operates by automatically feeding wood chips from the silo into the combustion chamber, where they are burned to produce heat.

This generated heat is then transferred to water within a closed-loop system, which circulates through pipes embedded in the walls of the digestion tanks. This indirect heating method maintains optimal temperatures within the tanks, promoting efficient microbial activity and biogas production.

6.8.2.9 Combined Heat and Power (CHP) unit

The proposed development includes a 2 MWe containerised Combined Heat and Power (CHP) unit, located near the biomass boiler to the west of the bunded area. Intended for use as an emergency power source, the CHP unit provides a reliable backup, ensuring continuous site operations in case of power interruptions. The CHP can utilise biomethane gas produced on-site to generate electricity, which can power essential functions across the facility. Additionally, a heat exchanger integrated with the CHP recovers excess heat generated during operation, optimising energy use and supporting the site's sustainable energy management.

6.8.2.10 Gas Flare

The proposed gas flare will be installed on-site as a critical safety measure, designed to operate only under specific conditions to ensure safety and regulatory compliance. This flare will activate solely if no other outlets, such as the biogas upgrading unit or CHP, are available to handle the produced biogas.

Controlled and monitored by the Supervisory Control and Data Acquisition (SCADA) system, the flare offers discreet, efficient operation with a concealed flame and low noise levels (below 65dB). This design ensures minimal disruption while providing a reliable safeguard in managing excess biogas safely.

6.8.2.11 Supervisory Control and Data Acquisition system

A supervisory control and data acquisition (SCADA) system will be installed for ease of operation and monitoring of plant processes. This system comprises hardware and software components to monitor and control industrial processes within the site. SCADA will be used to monitor and control the anaerobic digestion process, biogas upgrade, grid injection and associated plant and emissions control devices.

6.8.2.12 Site Office and Control Building

The Site Office and Control Building is a single-storey, timber-clad structure centrally located within the facility, designed to support both operational and administrative functions. The building includes a control room equipped with real-time monitoring systems, enabling operators and technicians to oversee all facility processes

efficiently. It also houses essential staff facilities, such as offices, a meeting room, a laboratory, welfare amenities, changing rooms, showers, a canteen, and co-working spaces, ensuring comprehensive support for the site's workforce. Additionally, a first-aid facility and storeroom are included for safety and operational needs. Staff parking is available nearby, accessible to those arriving by car, bicycle, or on foot.

Outside, dedicated amenity areas provide landscaped seating and pedestrian-friendly spaces adjacent to the office, offering staff a pleasant area for breaks and lunch.

6.8.2.13 Landscape and Maintenance

The landscaped areas around the facility are designed with ecological enhancement in mind, featuring native species like willow to promote local biodiversity. The approach focuses on natural recolonisation, with minimal soil disturbance to encourage habitat connectivity across the site. Maintenance requirements are kept low to reduce operational upkeep while maximising the site's ecological value. This approach delivers a dual benefit—minimising long-term maintenance while supporting native biodiversity and enhancing the natural environment.

6.8.2.14 Bunding

The proposed development includes a central bund to contain the primary digester tanks, storage tanks, and other processing equipment. Designed to sit approximately 1.5 meters below the surrounding ground level, the bund can contain 110% of the largest tank's volume, ensuring robust containment in case of a spill or failure in accordance with IPC Guidance on Storage and Transfer of Materials for Scheduled Activities (EPA, 2004.

Runoff from the bunded area is managed through an underground pipe network, directing it to a central pump station, where it is then routed to the storage lagoon for reuse within the biomethane process. This bund design provides enhanced safety, environmental protection, and efficient management of potential spills or excess process water. Maintenance vehicle access to the bund will be provided via a ramp.

Bunding is also provided to the proposed fuel tank for refuelling machinery located on-site.

6.8.2.15 Water Supply

Existing Watermain

The site is served by a 75mm private water main managed by Moyne Group Water Scheme from along the southern boundary. (A Letter of Consent, enclosed as part of the planning application, has been provided by Moyne Group Water Scheme to the Applicant to facilitate water supply to the proposed development.)

Proposed Water Supply (Office)
A 50mm connection from the 75mm Group Water Scheme main will supply the site office and administration building, supporting an estimated daily use of c. 360 liters for up to six permanent staff. Firefighting water will be supplied separately via rainwater harvesting.

Proposed Water Supply (Biomethane Process)
The biomethane process requires approximately 60 m^3 of water daily, which will be met through rainwater harvesting. Runoff from roofs, hardstanding areas, and yards will be collected in designated lagoons and basins. The Process Area Runoff lagoon is the primary source, while an additional 2,200 m^3 of water (36 days of supply) is stored in the Non-Process Area basin to cover drought scenarios. Storage sizing was verified using rainfall data from a nearby weather station.

Proposed Firefighting Requirements
The facility must maintain a firefighting water supply capable of delivering 35 liters per second for 120 minutes. Since no public hydrant system is available, a 310 m^3 permanent water storage volume, filled by rainwater runoff, will serve firefighting needs. This volume will be retained within the site's attenuation basin, which can be used directly for firefighting draw-down during emergencies.

6.8.2.16 Wastewater Infrastructure and Proposed Strategy

Existing Wastewater Infrastructure

There is no existing wastewater infrastructure in the vicinity of the site.

Proposed Wastewater Strategy

The only wastewater generated on-site will come from the office and administrative building. This wastewater will be directed to a domestic pump station located east of the office. From there, it will be pumped through a fully enclosed rising main to the primary digester within the bund, integrating it into the biomethane process for re-use.

The proposed pumping station will be a custom-designed package plant sized to handle daily wastewater loads for six staff, with a total estimated load of 360 liters per day. The system will also include a sump or tank providing 24-hour emergency storage of 0.36 m^3. With the biomethane process reusing all wastewater produced, **no external wastewater discharge is required**.

Please refer to Infrastructure Design Report, prepared by Donnachadh O'Brien and Associates (Ref. 2429-DOB-XX-SI-RP-C-0001) dated October 2024, enclosed as part of the planning application.

6.8.2.17 Surface Water Drainage Strategy Summary

The surface water drainage strategy for the proposed biomethane facility at Lisheen is designed to manage runoff sustainably, with a focus on separation of process and non-process water. The site is divided into two distinct drainage catchment areas:

- **Non-Process Area Runoff:** This includes runoff from roofs, car parks, and non-processing yards. Runoff is directed to an above-ground storage basin and discharged at a controlled rate (Qbar rate) into a field boundary drain to the south, ultimately flowing towards the Black River. Sustainable Drainage Systems (SuDS) features, such as bioretention swales, improve water quality and manage flow rates, with the system designed to handle a 1-in-100-year storm event plus a 20% allowance for climate change.

- **Process Area Runoff:** Runoff from areas directly involved in biomethane production, such as bunded areas and process yards, is contained in a dedicated above-ground lagoon. This runoff is reused within the biomethane process, with no outflow required. The surface water will not be discharged off-site, but will rather be re-used within the biomethane development process. The lagoon is sized to handle average rainfall, with additional capacity for drought conditions, and ensures full recycling of water for operational needs. Emergency storage tanks and buffer tanks provide added resilience against extreme weather events.

The entire surface water network complies with local and national drainage guidelines and has been designed in consultation with the Local Authority, with a strategy that minimises impact on downstream watercourses and supports on-site water reuse.

Summary of SuDS Measures for Proposed Development

The proposed biomethane facility employs several SuDS measures to manage surface water sustainably and support on-site water reuse:

- Bioretention Swales: These swales capture and filter rainwater from roadways and hardstanding areas, improving water quality and reducing runoff flow rates.

- Detention Basins: Above-ground basins provide on-site storage for excess runoff during heavy rainfall, controlling discharge rates and mitigating downstream flood risk.

- Rainwater Harvesting Lagoon: Runoff from process areas is directed to a dedicated lagoon for reuse in the biomethane process, eliminating the need for off-site discharge and providing an additional water source during dry periods.

These measures enhance water quality, manage stormwater effectively, and promote water recycling on-site.

6.8.2.18 Operational Waste Management

The main waste expected at the Proposed Development include general packaging waste, general office waste and municipal canteen waste from employees onsite. This will however be segregated accordingly and will be collected by a qualified waste contractor.

6.8.2.19 Power Supply

The principal power supply for the proposed development will be sourced from the national electricity grid through a dedicated substation located to the east of the bund. The site is also strategically positioned to utilise local renewable energy sources, including an on-site wind farm and a permitted solar farm (Tipperary Co. Co. Reg. Ref. 211128). While the national grid has sufficient capacity to meet the development's energy needs, the Applicant intends to maximise the use of locally generated renewable energy, where possible, aligning with sustainable energy practices and reducing dependency on grid-supplied electricity.

6.8.2.20 Lightning Protection System

An independent lightning consultant was engaged by the applicant to design a level 2 Lightning Protection System for the site. The Lightning Protection System is designed in accordance with BSEN60079 & BSEN 1127. The system is designed to provide a protective virtual dome over the site. The purpose of the protective dome is to ensure no structures or tanks are within any potential lightning strike path. Lightning finials are strategically positioned around the site to ensure all areas of the site are protected from a potential lightning strike. The finial positioning is determined by detailed 3D site modelling which was undertaken as part of the lightning protection design.

6.8.2.21 Site Security

Entrance to the site will include a locked gate, controlled entrance barrier and CCTV monitoring system. The proposed development includes 2.4-m high mesh fencing and stock-proof fencing along site boundaries to maintain security and prevent unauthorised access.

6.8.2.22 Operating Hours

The facility will operate continuously, 24 hours a day, 7 days a week, as anaerobic digestion is an uninterrupted biological process. Generally, feedstock deliveries will occur between 07:00 and 19:00, Monday to Friday, and between 07:00 and 16:00 on Saturdays. However, during peak periods, such as harvest seasons, feedstock may be accepted outside of these hours, including evenings, weekends, and bank holidays, to accommodate seasonal demands.

6.9 Licensing Requirements and Other Controls

6.9.1 Environmental Protection Agency (EPA)

The EPA were consulted during the design phase of the proposed development, to verify authorisation requirements under the Environmental Protection Agency Act 1992 (as amended) or the Waste Management Act 1996 (as amended).

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, outlined in Table 2.5 below:

> *"11.4 (a) Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day involving one or more of the following activities (other than activities to which the Urban Wastewater Treatment Regulations 2001 (S.I. 254 of 2001) apply):*
>
> *1. biological treatment;*
> *2. physico-chemical treatment;*
> *3. pre-treatment of waste for incineration or co-incineration;*
> *4. treatment of slags and ashes;*
> *5. treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components.*
>
> *(b) Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities, (other than activities to which the Urban Wastewater Treatment Regulations 2001 (S.I. No. 254 of 2001) apply):*
>
> *1. biological treatment;*
> *2. pre-treatment of waste for incineration or co-incineration;*
> *3. treatment of slags and ashes;*
> *4. treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components.*
>
> *(c) Notwithstanding clause (b), when the only waste treatment activity carried out is anaerobic digestion, the capacity threshold for that activity shall be 100 tonnes per day."*

In the event of a grant of licence by the EPA to carry out activities that require such licence, it is expected that the following will be regulated under such licence:

- Emission Limit Values for emissions to air and stormwater;
- Monitoring requirements for emissions;
- Resource use and energy efficiency;

- Waste management control documentation;
- Waste acceptance procedures and records;
- Storage and transfer of substances;
- Changes to operations and the physical fabric of the facility;
- Facility management including the requirement for an environmental management system (EMS);
- Accident prevention and emergency response including fire water retention; and,
- Operational controls.

An Environmental Management System (EMS) will be put in place for the facility, as will be required by the IE Licence. The operator shall develop the EMS in accordance with ISO14001:2015, applying for accreditation when operational. This EMS will include but not be limited to the following:

- Measures to comply with the IE licence and other relevant environmental legislation;
- Waste Acceptance Procedures;
- Standard Operating Procedures;
- Measures to comply with the corporate sustainability goals (e.g., reducing water and energy consumption); and
- Accident prevention and emergency response procedures

6.9.2 Department of Agriculture, Food and Marine (DAFM)

The Anaerobic Digestion Facility will be a 'Type 1' plant under the European Union (Animal By-Products (ABP)) Regulations (S.I. No. 187 of 2014).

The facility will process Category 2 animal by-products, specifically farmyard manures (i.e. equine, farmyard and poultry manure). Approval will be required from the Department of Agriculture, Food, and the Marine (DAFM) in accordance with Article 24(a) of Regulation (EC) No. 1069/2010, for the acceptance and/or treatment of animal by-products.

DAFM were consulted during the design phase and the proposed development has been designed in accordance with DAFM guidance CN11: Conditions for approval and operation of biogas plants transforming animal by-products and derived products in Ireland. The application process for approval and operation of the proposed facility by the DAFM occurs in three stages as follows;

1. Application for approval in principle. **(Importantly, the proposed development has received first stage approval from DAFM.)**
2. Application for conditional approval to operate which allows an operating period of three months to test and demonstrate ABP compliance. This stage commences following the construction and handover of the facility.

3. Full approval.

This application process will continue upon receipt of planning permission.

6.9.3 SEVESO III Directive / Control of Major Accident Hazards (COMAH) Regulations

The Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S. L No. 209 of 2015) transposes Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC ("the SEVESO III Directive").

The purpose of the COMAH Regulations is to lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents when they occur, with the overall objective of providing a high level of protection in a consistent and effective manner.

The COMAH Regulations place an obligation on operators of establishments that store, handle, or process dangerous substances above certain thresholds to take all necessary measures to prevent major accidents and to limit the consequences for human health and the environment. Under the Regulations, an establishment may qualify as upper tier or lower tier, depending on the inventory of dangerous substances; sites that store, handle or process dangerous substances below a certain threshold do not qualify as establishments under the Regulations.

6.9.3.1 SEVESO / COMAH Assessment Summary

According to the Land Use Planning Assessment by AWN Consulting, the proposed development is classified as a "lower tier" COMAH establishment under the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, S.I. No. 209 of 2015. This classification means that the facility must comply with specific safety and reporting requirements to manage and mitigate risks associated with hazardous substances.

The assessment, conducted in line with 2023 Health and Safety Authority (HSA) guidance, indicates that individual risk contours do not extend beyond the site boundary to any off-site workplaces or areas accessible to the public. Additionally, the Land Use Planning zones do not impact sensitive receptors, confirming that the off-site risk levels are within acceptable limits per the HSA guidance.

As a "lower tier" COMAH establishment, the Applicant must:

- Develop a site-specific safety plan and operational procedures in line with COMAH requirements.
- Notify the HSA of the facility's classification.
- Implement regular risk assessments, safety training, and emergency planning to maintain compliance with COMAH regulations.

These steps ensure adherence to safety protocols, protecting both on-site staff and the surrounding community.

6.10 References

- European Union (2023) 'Renewable Energy Directive (RED III)', EU Publications Office.
- European Union (2022) 'REPowerEU: Joint European Action for More Affordable, Secure, and Sustainable Energy', EU Publications Office.
- Government of Ireland (2023) 'Climate Action Plan 2023', Department of the Environment, Climate and Communications.
- Government of Ireland (2023) 'National Biomethane Strategy', Department of the Environment, Climate and Communications.
- Southern Regional Assembly (2020) 'Regional Spatial and Economic Strategy (RSES) for the Southern Region', Government Publications.
- Tipperary County Council (2022) 'Tipperary County Development Plan 2022–2028', Government Publications.
- Government of Ireland (2018) 'National Planning Framework (NPF)', Government Publications.