

# Attachment 6

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## 1. NON-TECHNICAL SUMMARY

REVISION	DESCRIPTION	ORIGIN	REVIEW	STAGE	NRGE APPROVAL	DATE
1	Issue 1 IE Licence Application Reg. No: P0986-01 Application	JO'B/MM E/MS	MME/MS	Issued	Y	30/10/2013
2	Revised IE Licence Application Reg. No: P0986-01 Further Information Response	JO'B	MME/MS	Issued	Y	02/05/2014
3	Revised IE Licence Application Reg. No: P0986-01 Further Information Response	JO'B	MME/MS	Issued	Y	27/11/2014
4	Revised IE Licence Application Reg. No: P0986-01 Further Information Response	JO'B	MME/MS	Issued	Y	01/07/2015

This is the summary of the information contained within the Environmental Impact Statement, which reports the findings of the assessment into the environmental effects associated with the proposed development of a Biogas Plant at Barryshall, Timoleague, Bandon, Co. Cork.

The Environmental Impact Assessment was prepared by NRGE Ltd as a submission to be included in support of a Planning Application to Cork County Council and a Waste Facility Licence to the Environmental Protection Agency. The Environmental Impact Assessment has been produced in accordance with the European Community Directive Environmental Impact Assessment Directive 85/337/EEC (as amended by Directives 97/11/EC, 2003/35/EC, 2009/31/EC) and the Regulations implementing the Directive in Ireland: the Planning and Development Act 2000-2010, the Planning and Development Regulations 2001-2012 and the European Communities (Environmental Impact Statement) Regulations 1989-2000.

An Environmental Impact Assessment has not, at this time, been completed for the Glass House Facility or the proposed pipeline connecting the AD Plant and the Glass House.

Planning for the Biogas Plant was granted to Timoleague Agri Gen Ltd. of Barryshall, Timoleague, Co. Cork, by Cork County Council on the 3<sup>rd</sup> September 2013.

- Final grant dated 03/09/2013
- Managers Order and Schedule of Conditions dated 29/07/2013
- Decision Notification Grant dated 30/07/2013

The proposed project has involved consultation with stakeholders locally, regionally and nationally, including statutory bodies and regulatory authorities, in an attempt to identify concerns and predict any likely environmental effects of the development, and the evaluation of these effects against specified criteria such as legal guidelines and limits.

This project has involved formal and informal discussions with a large number of stake holders from the local, regional and national categories, to help formulate an integrated model, that will stand up to detailed critical analyses. In the current climate such critical analyses will be applied not only from an environmental perspective, but also from an economical and sustainable perspective. The vision is to create a centre of excellence for an Anaerobic Digester and associated integrated business, which will provide a template that can be applied to other similar regions throughout the jurisdiction.

It is the intention of this summary to provide all the relevant information contained within the Assessment, in a non-technical and comprehensible manner. The Environmental Assessment is an evaluation of the potential significant likely environmental impacts that this development will have on the locality.

Timoleague Agri Gen Ltd. is a limited company with two directors, both of whom are active progressive farmers in the local community. These are Mr. Colin Bateman, upon whose farm the proposed development is located, and Mr. Martin O' Donovan, whose pig farm unit is located to the North of the proposed site. The Directors of the company or the company have at no stage been convicted of an offence under the Act of 1996, the Local Government (Water Pollution) Acts 1977 and 1990 or the Air Pollution Act 1987 or The EPA Acts 1992 and 2003.

The development will occupy a landscaped site of approximately 3.67 hectares (9.07 acres). The proposed development consists of a Biogas Plant consisting of 2 no Digester tanks, 2 no validation tanks, 1 no homogenising tank, 3 no geo-membrane lined manure storage tanks, 1 no fibre store, 1 No Feed Tanks, Reception Building, Plant Building, Pasteurisation Tanks, Weighbridge and associated site works including an integrated constructed wetland, to produce renewable energy and fertiliser. The proposed Anaerobic Digester will reduce net emissions from Mr. O' Donovan's Pig Farm as it will require fresh delivery of manure from the pig houses. It will also effect a net reduction of emissions in the area.

This proposal will aid compliance with Nitrate Directive Regulations and incorporates emission reduction measures. A map (Scale 1:2500) in **Attachment 1** of the Environmental Impact Statement clearly outlines the site boundary, marked red.

### **Facilities**

The buildings and their layout will be state of the art for the industry. A thorough review across Europe was undertaken of best available techniques to minimise emissions from the proposed development, and to maximise beneficial outputs. The Biogas Facility's storm water will be routed to a single storm-water monitoring point (identified as SW1 on Drawing 003 - *Overall Site Plan* included in **Attachment 2 of the EIS**), and then piped to the land drainage watercourse. Each individual component of the Biogas Plant will have an independent leak detection system with an individual inspection chamber for each section. These inspection points are identified as LD1 to LD12 on Drawing 001 - *Site Plan* included in **Attachment 2** of the EIS.

Drawings of the facility, Numbered 001 to 035, detail the various aspects of the development including location maps no 007 and no 008. Drawings No 028 and no 029 are Process Flow Diagrams. Drawing No 28 is a simplified schematic diagram indicating the rudimentary outline of the process. Whereas Drawing No 029 is a detailed schematic indicating where pumps, valves probes etc are located on the process neither provides a specific position of the structures on the site.

Drawing 003 indicates the specific location of the structures on the site in accordance with the requirement of the Planning Regulations. The necessity of the Process Diagram 029 is the scale of the site plan 003 is too small to indicate all pipe routes which would be too cluttered on an overall site plan.

Energy and resource usage will be consumed efficiently. An energy audit will be carried out as required and in compliance with the conditions for High Efficiency CHP units to determine possible cost.

All manure will be transported by tractor tanker/articulated lorries from Martin O' Donovan's Pig Farm Unit to the proposed development at Barryshall, Timoleague, Co. Cork as per Planning Permission.

### **Geo Membrane Lined Manure Basins**

The Geo-membrane lined manure basins will be built as per Odournet UK 2001's report "**Odour Impacts and Odour Emission Control Measures for Intensive Agriculture - Part A Odour annoyance assessment and criteria for intensive livestock production in Ireland**".

Enclosed slurry storage

"Flexible solutions are becoming more popular, using methods of cover that avoid creation of headspace. An example of a covered storage without headspace are foil basins in an earth enclosure, with a floating foil cover.

Floats support the cover, and an extraction system for escaping digestion gas is provided in the design. They are made out of reinforced plastic (PVC) foil of 1 mm thick (see Figure 9). Stirring of the slurry is achieved through pumping slurry through a specially designed fixed tubing system. These fully enclosed foil basins have an economic lifespan of at least ten years.

Hundreds if not thousands of these systems have been installed in the Netherlands, at commercial pig units. No precise cost data are available, but the supplier indicates that the investment cost is close to half the cost of a concrete storage tank of the same capacity. The foil liner will be viable for an economic life of 10-14 years."

### **Biogas**

Biogas production takes place in both of the Digester Tanks at the optimum temperatures and an oxygen free environment. In the vertical Primary Digester the operating temperature is 50

- 55°C. The gas produced occupies the void at the top of the digester tank which has a fixed steel rigid roof; the accumulated gas is piped to the CHP unit and /or boiler.

In the horizontal secondary digester the operating temperature is 38°C. This is a steel sectional tank with a double membrane cover; an air blower maintains a constant pressure of 0.5 Bar between the 2 sheets of the membrane. The gas collection route pipe-work is connected to both digester tanks to maintain a minimum pressure throughout the tanks. This pushes the accumulated biogas to the CHP Unit (The blower is similar to those used by Bouncing Castles).

Conversion of gas to Electricity and Heat is done in a Combined Heat and Power Unit (CHP). This consists of an internal combustion engine coupled to an alternator. The biogas is delivered to the engine using air pressure generated by the double membrane cover on the Secondary Digester. The engine is a spark ignition engine which turns the crankshaft and the alternator to generate electricity which also produces heat around the engine's combustion chambers; water used to cool the engine provides the heat for the digestion process and for space heating.

Gas production is calculated to approximately the capacity of the CHP Unit, in this case approximately 1.1MW of electricity and 1.25MW of heat. The electricity will be exported off-site to a dedicated grid connection, this connection will be a 10/20kv 3 phase line which consists of series of single poles with 3 cables approximately 40mm diameter similar to any existing rural 10/20kv line. It is intended to generate electricity for export to the national grid on a continuous basis with 500 hours downtime (5% per year estimated).

The Commission for Energy Regulation (CER) require that up to 80% of heat produced at a facility is recovered in order to comply with the conditions of the electrical tariff. Accepted recovered heat includes pasteurisation heat and process heat.

Heat produced by the CHP Unit will be utilised to provide process heating for biogas production.

Furthermore, alternative heat utilisation processes include the Meat Processing Plant adjacent to the proposed site for Timoleague Agri Gen; feasibility studies are ongoing in this regard.

Commercial negotiations are economically sensitive and there is no guarantee that these negotiations will be successful.

## **Heat and CO<sub>2</sub>**

Feasibility studies have shown that it is not economically viable at this time to monitor and transfer heat and CO<sub>2</sub> to the proposed Glass House Facility.

### **Heat**

#### *Control Measures*

Commission for Energy Regulation approved heat meters will be utilised for each individual heat source. Please find enclosed CER requirements and specification for verifiable heat recovery (*Attachment 2*). Drawing No 29 Rev 4 – Flow Diagram shows 2 no heat meters (*Attachment 3*):

- Heat metre 1: - is used to differentiate the temperature between the flow and return, and the metered volume between to calculate the heat usage.
- Heat metre 2: - auxiliary heat utilisation only - is used to differentiate the temperature between the flow and return, and the metered volume between to calculate the heat usage.

#### *Utilisation*

The Commission for Energy Regulation (CER) require that up to 80% of heat produced at a facility is recovered in order to comply with the conditions of the electrical tariff.

Accepted recovered heat includes pasteurisation heat and process heat.

Alternative heat utilisation processes include the Meat Processing Plant adjacent to the proposed site for Timoleague Agri Gen; feasibility studies are ongoing in this regard.

Commercial negotiations are economically sensitive and there is no guarantee that these negotiations will be successful.

### **CO<sub>2</sub>**

#### *Control Measures*

Control measures for emissions at the facility will comply with the EPA's Guidance on Emissions:

CO - 850 mg/Nm<sup>3</sup> ref 5 % O<sub>2</sub> dry gas  
NO<sub>x</sub> - 500 mg/Nm<sup>3</sup> ref 5% O<sub>2</sub> dry gas  
TOC - 1000 mgC/Nm<sup>3</sup> ref 5% O<sub>2</sub> dry gas  
SO<sub>2</sub> - 200 mg/Nm<sup>3</sup> ref 5% O<sub>2</sub> dry gas  
Temp - 478 deg C.

#### *Utilisation*

CO<sub>2</sub> produced at the facility will be expelled to the atmosphere through the stack.

## **CHP Plant, Biofilter, Boilers and Emissions to Air**

### ***CHP Plant***

Following consultation with the CHP manufactures; the use of recycled air from the biofilter does not meet their specifications for the CHP Unit and as a result CO<sub>2</sub> emissions will be emitted to the atmosphere through the stack.

Modifications to Drawing No 29:

- Identification of the discharge expelled to atmosphere from the biofilter.
- Identification of the Air Abstraction Pipework connecting the Reception Building, the Fibre Store, and the Intake and Batch Heating Tank within the Reception Building.

### ***Biofilter***

The following are the Areas from which air is extracted for treatment:

- The Intake building
- The Fibre store
- The Batch Heating Tank within the Reception Building

As the Dispersion Model Report compiled by Brian Sheridan of Odour Ireland indicates, exhaust air from the Biofilter will be emitted to the atmosphere through the stack.

Routing of the exhaust emissions to the CHP Unit will not be carried out as the used recycled air from the Biofilter does not meet the specifications for the CHP unit.

### ***The Boiler/The Exhaust Boiler***

The exhaust boiler is in an integrated part of the CHP system. It recovers the expelled heat from the engine as it is a 'Gas to Water' heat exchanger.

- The boiler:
- is utilised during startup phase of the process
  - The CHP unit requires a 5-10% maintenance downtime period i.e. approx 850 hours/annum, in order to maintain the process heat and pasteurised heat for the process while the CHP Unit is not in service.

### ***Gas Purification***

The gas purification system reduces the sulphur concentration in the gas to below 75ppm before entering the engine. The gas purification system to be utilised on site is in accordance with BAT conclusion number 68 of the Waste Treatments BREF (2006).

### **Manure storage capacity**

The proposed facility provides storage on site in three geo-membrane lined storage basins, 4,500 m<sup>3</sup> capacity each. The secondary digester has a 4,300 m<sup>3</sup> capacity. The pre-mix tanks have 220 m<sup>3</sup> and 1,500 m<sup>3</sup> capacity respectively. In addition there are separate plans to provide additional 7,000 m<sup>3</sup> storage on customer farms. This is a total of 22,020 m<sup>3</sup> which is equivalent to 29 weeks output on site.

### **Land-spreading Areas**

The pig manure from Mr. O' Donovan's Farm is currently being recovered on customer farms as a fertiliser in the general area of South West Cork. There is a total of 2,461 hectares of good agricultural land available in the area for this purpose. Upon the completion of this Anaerobic Digester, this same list of customer farms will be used to recover the liquid digestate as a fertiliser source. The bedrock in the region is mostly Devonian Old Red Sandstones (DORS), containing a Locally Important Aquifer.

Timoleague Agri Gen Ltd. and O' Donovan Pig Farm Unit have, with the consent of the existing customer farm list sufficient capacity to recover the nutrients in the liquid digestate form, with sufficient capacity to provide a 20% reserve.

### **Manure Spreading**

The application of digested manure to farmland is regulated under European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2009 S.I. No. 31 of 2014 and distribution of digested manure from this site will comply with those regulations.

Digested Manure will not be supplied to customer farms between 15th October and 15th January in any year except with the consent of the local authority, or any other relevant authority. Outside that period, digestate manure will be supplied from the site to a customer farmer, only in response to an order. Managed and used in this way, manure digestate produced at this Facility will not have any adverse impact on environmental parameters either inside or outside the site. However recognition must be taken of the fact that 50% of these traffic movements occur in the general area currently, and will continue to do so irrespective of the construction of this proposed development, in the form of current deliveries of pig slurry, belly grass, dairy sludge and other organic materials to farms in the general area for use as agricultural fertiliser.

It is planned to import an additional 25,567 tonnes of organic material per annum to mix with the pig manure to increase the efficiency of the proposed Anaerobic Digester. The additional organic material is laid out in **Table 1** below, along with the estimated volume and source of each. A menu of these materials will be used subject to their availability and appropriate 'mix' of materials.

The current volume of pig manure produced on Martin O' Donovan's farm is 14,600 tonnes. Planning permission has been granted to increase his sow number from 1,150 to 1,750,



which will increase the slurry production to 23,000 tonnes referenced. It is likely that the construction required to house this additional stock will commence in quarter three 2013.

**Table 1: The Intended Feedstock for Processing**

<b>TYPE</b>	<b>Volume</b>
	<b>(TONNES)</b>
Pig Manure	23,000
Seaweed	5,000
Dairy Flotation Sludge	11,000
Feedmill Residuals	200
Fruit residuals	300
Residuals from vegetables	750
Other slurry fish manufacturing	300
Paunch pigs	300
Paunch cows	5,000
Flotation sludge	1,200
Fat trap waste	600
Draff via Beer Production	750
Bread	100
<b>TOTALS</b>	<b>48,500</b>

It is proposed to primarily target organic materials that are currently being land-spread, as this process will greatly reduce current environmental impacts, in accordance with current land-spreading directives. In accordance with Regulations: EC no 1069/2009, EC no 142/2011 and EC (TSE and Animal by-Products) Regulations (S.I. No 252 of 2008 as amended), the approval of the Environmental Protection Agency, Cork County Council and the Department of Agriculture will have to be granted, in order for the permission to treat other waste types at this proposed Anaerobic Digester.

This organic material will be imported onto the site at a rate of 49 weekly in/out movements. It will be delivered directly into the relevant pre-mix tanks. The high fibre material will be transferred directly into the underground pre-mix tanks, and liquid material will be pumped into the sealed storage tanks on site. Waste material will only be accepted on site from approved facilities, to be delivered by approved permitted contractors. All deliveries will be

recorded on site, and this register will be available for inspection by officials from Cork County Council, Department of Agriculture, Food and the Marine and the Environmental Protection Agency. Waste acceptance and characterisation procedures are included in the following headed *Organic Waste Acceptance and Characterisation Procedure*.

The plan to develop an Anaerobic Digester in this area first took seed in 2003 when following a detailed review of all available alternative technologies to treat pig manure, it was decided the most suitable technology was Anaerobic Digestion, which is simply the natural breakdown of organic waste in the absence of air.

A Digester is a warmed, mixed, airless vessel which creates ideal conditions for the necessary bacteria to naturally break down this material. A chain reaction of different bacteria attacks the carbon in the digesting material, giving off methane gas as Biogas (65% Methane). This gas can be collected, contained, and then burned to create electricity and heat, or in some cases processed further into a vehicle fuel. It is now accepted within the EU that farming and life in general must become more sustainable with regards to protecting the environment, and maintaining rural life.

There is now a significant amount of legislation that is demanding this sustainable and integrated approach. The use of anaerobic digestion can help to meet many of these targets.

- (i) The pig manure produced on Mr. O' Donovan's Pig Farm will provide the required fuel base for this Anaerobic Digester i.e. 23,000 tonnes (at full production) and will be supplied by tanker/articulated lorries to the AD facility.
- (ii) The additional fuel waste required (25,000 tonnes) will be sourced locally, and transported to the Facility by lorry, at a rate of 49 in/out weekly movements.
- (iii) The gas generated will be used to supply power to the Facility.
- (iv) The excess power will be exported to the National Grid.
- (v) The solids will be separated, including approximately 80% of the Phosphorous, currently being reviewed as a soil conditioner. Other alternative reuse options are also being investigated.
- (vi) The liquid digestate will be used on customer farms, in accordance with a digestate fertiliser plan.
- (vii) The odour impact of spreading digestate versus pig manure, belly grass, and/or dairy sludge will be reduced by 80% min.
- (viii) The digestion process will destroy 98% of all pathogens & parasites.
- (ix) The digestate is relatively stable, and will not produce a crust in storage.
- (x) The digestion process will kill all weed seeds.
- (xi) The digestate is a pleasant, clean and easy material to handle.

### **Application methods**

The application of liquid digestate to agricultural land as a fertiliser will be carried out using specialist equipment fitted to tractor tankers which will ensure direct application to ground, thereby increasing the nitrogen uptake of plants.

Steps will be taken with the customer farms whereupon it is proposed to use liquid digestate and in designing the management of its use, to ensure that no contamination of surface and groundwater takes place. The proposed development of an Anaerobic Digester will significantly reduce the risk to surface-water and groundwater. The existing customer farm base has the capacity to recover the proposed volume of liquid digestate.

### **Storm/clean surface water**

All clean water is separated from soiled water. Roof water is collected via galvanised gutters and downpipes and piped underground to a nearby watercourse via a stormwater monitoring point identified as SW1 on Drawing 003 - Overall *Site Plan* included in **Attachment 2** of the EIS. This monitoring point will be visually inspected on a weekly basis. A register of these inspections will be maintained on site for inspection. A water sample will be taken on a quarterly basis from this point (SW1) for analysis at an independent accredited laboratory.

The surface water collected from the open yard area in front of the reception building, and the access road will be collected and diverted to an integrated constructed wetland (ICW), before being discharged to the adjacent watercourse, via a monitoring point which will also be visually inspected on a weekly basis – SW2. A register of these inspections will also be maintained on site for inspection. All emissions from the facility (including storm water discharges) will be controlled and monitored by condition of the waste licence if granted by the Environmental Protection Agency.

Drawing 40 – Location of land drain, SAC and SPA identifies SW1, SW2, the path of the land drain and the outflow of the land drainage network to the East Cruary River (Grid Reference E146839, N42711).

The issue of water is detailed further in *Section 6.4* of the EIS.

### **Surface Water**

Teagasc have put in place a regional monitoring programme at a point up-stream from this site as part of their Agricultural Catchments Programme over recent years, wherein they have recorded flow rates and ambient monitoring has been carried out for phosphorus and nitrogen. Upon completion of this proposed development it is intended to engage with this programme to monitor any impacts from the displacement of applications to land of pig manure, and other organic materials, in this catchment area, with the digestate fertiliser from the anaerobic digester process.

In order to maximise farm outputs and profits, grassland and tillage production rely on a supply of essential plant nutrients Nitrogen (N) and Phosphorus (P). The use of these

nutrients is regulated by recommended guidelines in feed and fertiliser and also the EC Good Agricultural Practice for Protection of Waters (S.I. No 31 of 2014) which implements the EU Nitrates Directive into Irish Law.

One of the main aims of Teagasc's Agriculture Catchments Programme is to protect and improve the quality of water, both surface and ground water. This programme intends to work with 300 farmers across six catchment areas in order to monitor and assess the measures implemented by the Nitrates Action Programme in compliance with the Nitrates Directive and the recommended guidelines.

It is intended to cooperate fully with Teagasc in this programme to monitor on-going future impacts from this proposed development.

See Teagasc report included in **Attachment 4** of the EIS.

#### Groundwater

There is no groundwater monitoring currently within the site boundary. In the context of ground water, the main hazard associated with the proposed development is the storage and handling of liquid organic material – pig manure and other organic material and potential accidental spills of same reaching ground water.

All organic waste storage structure will be constructed to Department of Agriculture requirements and will be sealed and banded. An integrity assessment will be carried out on all storage tanks prior to commissioning. Storage structures will have individual leak detection systems which will be monitored on an ongoing basis during operation.

#### Traffic

An assessment of sightlines at the entrance to this Facility was undertaken by Mr. John Mc Eniry in order to ascertain that adequate sightlines were available to support an increase in the level of traffic movement due to the proposed level of organic material to be delivered to the Biogas Plant. This report is included in full in **Attachment 13**. However, recognition must be taken of the fact that 50% of these traffic movements occur in the general area currently, and will continue to do so irrespective of the construction of this proposed development, in the form of current deliveries of pig slurry, belly grass, dairy sludge and other organic materials to farms in the general area for use as agricultural fertiliser.

A topographical survey was carried out on the existing road from the proposed entrance for the Biogas Plant to Ballinadrollm Bridge, located North of the proposed entrance. The stretch of road varied in width from 6.1 to 6.5 and 300mm wide verges with 1.5 to 2.0m high stone walls on both sides. The stone walls have heritage merit and it is considered that their demolition would be unwelcomed. It is proposed to maintain the foliage on top of the walls by cutting back in the appropriate season from September to March.

The issue of Traffic is detailed further in *Section 6.9* of the EIS.

## Noise & Odour

This planned operation will be developed on a green site therefore there are no existing significant effects on noise or odour.

On completion of the project, all aspects of the facility which have the potential to cause nuisance noise or odours will be housed in sealed and soundproofed buildings e.g. the Combined Heat and Power Unit and Generators. The only issues will arise from the delivery of the imported organic matter but this will not be a problem outside of the boundary of the site. This imported fraction of matter will also be transported in sealed containers helping control odours. Noise and Odour are discussed in detail in *Section 6.10 Noise* and *6.5 Air* of the EIS.

It is not intended to provide ventilation or air extraction to the stores for the following reasons:

- (i) The digestion process reduces significantly the odour potential from the biomass and essentially converts odorous compounds to biogas rendering the solid digestate effectively odourless. The biomass will be allowed to accumulate in the store predominantly in the closed land-spreading period from October to January. The proposed fibrous material store is a 3 section portal framed store with each section enclosed fully separately.
- (ii) Maintaining the doors closed during normal operation will reduce the air movement from the building to the surrounding hinterland.

## Air Dispersion Modelling

Air Dispersion Modelling in accordance with the Air Dispersion Modelling Guidance Document issued by the EPA 2010, has been prepared by Dr. Brian Sheridan of Odour Monitoring Ireland Ltd. This report is attached.

## Dust

Construction and operational procedures have the potential to generate dust emissions. The potential for impact from dusts depend on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. Most of the dust would be deposited close to the potential source and any impacts from dust deposition would typically be within several hundred metres or so of the construction area.

## Mitigation Measures

- The site access road onto the public road will be regularly cleaned and maintained as appropriate.
- The site will be regularly dampened during dry and/or windy conditions if required.
- Vehicles delivering materials to site will be enclosed or covered with tarpaulins, where necessary.

- A wheel-wash will be provided on the construction site if needed.
- Material handling systems and stockpiling of materials on site will be arranged to minimise exposure to wind.
- During movement of soil/fill material both on and off-site, trucks will be covered with tarpaulins, where required.
- Vehicles are to be kept in good working order and serviced regularly to minimise emissions.
- Vehicles travelling on access roads will not exceed the designated speeding limit i.e. 20km.
- The vehicle importing the biomass, once emptied, will be washed with an approved detergent or steam, while at the reception tank, using a high pressure washer.

### **Archaeological Features**

An assessment of Archaeological Features in the vicinity of the proposed development has been carried out by Dominic Delaney & Associates (*Attachment 7* of the EIS). It is considered unlikely that there are any unknown archaeological remains or features in the vicinity of the proposed development, or that the development will impact, either physically or visually, on the archaeological heritage of this area.

### **Heritage Areas**

The Biogas Plant and selected spread-lands will not have an impingement on any heritage areas (*Attachment 7* of the EIS).

### **Cultural Heritage and Material Assets**

Farming traditions in the area have been stock rearing, milk production, pig production and tillage. Animal manures are recycled onto the land reducing the cost of production.

### **Climate**

The most important contribution of this biogas development in the protection of the environment is that it reduces emissions of methane and ammonia. Methane is a gas that has a huge effect on climate that would otherwise be released, uncontrolled, from the land-spreading of raw pig manure, belly grass, and dairy sludge.

The issue of climate is detailed further in *Section 6.6* of the EIS.

### **Population**

The town of Bandon has a population of ca. 6,000 people, with a population of ca. 1,500 people in the town boundaries. The nearest settlement location adjacent to the proposed site is Timoleague village (1.5km) which has a population of ca. 300.

The proposed development will have a positive impact on human beings from the increased employment it will create, and the resultant reduction of existing impacts from emissions. The development will be located in an agricultural area; therefore the buildings will blend into the surrounding area. Also, the development will be landscaped with a screening of trees, shrubs and flowers. Thus, there will be no nuisance or loss of amenity (see *Attachment 20 - Photomontage of the proposed Anaerobic Digester Facility*). A *Landscaping Proposal* is

included in **Attachment 14** of the EIS which includes details regarding the location and height of the proposed berms as well as details regarding numbers and the species of the trees. The mature trees and the historic wall located to the north of the site will be retained. Effects of the development on air are insignificant outside the buildings and adjoining yards. Mitigation measures taken will minimise the effects of odour on the days of digestate spreading. The application of digestate will replace the current practice of pig manure application to land, resulting in an 80% reduction of odours generated, due to gas extraction.

This report was prepared in accordance with the EPA publication - *Odour Impacts and Odour Emission Control Measures for Intensive Agriculture*.

Noise levels from the development are unlikely to be a nuisance. The main sources of noise will be produced by the traffic and the generator. The generator is a permanent source of noise but is quite low and considering the seclusion of the site, this should not be a nuisance outside of the site boundary.

The development will have an insignificant effect on the climate of the area.

Thus, the measures that have been put in place will ensure that impact/effects of the development on human beings, noise, air, climate and the interaction of human beings, fauna, soils, air, water, climate, landscape and material assets will be minimised.

In a discussion paper published by the Environmental Protection Agency (January 2005), it concluded that "*Anaerobic Digestion has the potential to deliver multiple environmental benefits, including reduced water pollution potential, lower green house gas emissions, and reduced odours from agricultural slurries*".

This proposed development has the potential to benefit all stakeholders adjacent to the proposed site and the customer farms. The net result of this proposed development will be a reduction of existing impacts to the order of at least 30% from the site and 80% from the application of digestate in place of pig manure, belly grass, and dairy sludge to customer farms.

This proposed development has the potential to provide an economic outlet for crops grown by customer farmers in the area, on lands that may not otherwise be utilised fully. These crops can be fertilised by the digestate from the process.

A full process control system (SCADA) has been prepared for this proposed Facility. This report has been prepared by our Associates who have over twenty five years experience in the anaerobic sector. It is based on the professional management systems currently operational on similar Anaerobic Digestion Facilities throughout Europe. It details the type of system software, reporting, alarm systems, data exchange and functional systems required to operate a facility such as the proposed development. This expertise is available to the management and operators of the proposed development, at local and remote levels.

## **Monitoring and Register**

Proposals for monitoring storm water emissions at the site and for monitoring soil fertility are set down in the Environmental Report. A register of slurry quantities, rates and locations of spread-lands will be maintained for inspection and monitoring by Cork County Council and other Regulatory Bodies.

An Annual Environmental Report will be submitted annually to the Environmental Protection Agency, in accordance with the requirements of a Waste Facility Licence.

The intention for this project is that the Anaerobic Digestion Facility will provide valuable employment in the local and regional economies, and at the same time become a centre of excellence which will aid the development of similar projects to benefit the regional and national economies.

## **Emergency Response Plan**

An Emergency Response Plan and Procedures has been put in place to deal with emergencies, which includes:

- Identification of potential hazards that may be encountered during the decommissioning phase.
- Emergency telephone numbers including local doctor, garda station and fire brigade along with numbers for other various response services including contact details for the Environmental Directorate.
- Emergency response procedures for accidental spills, fire or injury to personnel.
- Identification of the person in charge of the site and implementation of the emergency plan.

The emergency plan will also detail information in relation to the incident which would have to be recorded in order to prevent a similar incident occurring again.

## **Hours of Operation**

Biogas Production or Anaerobic Digestion is a bacteriological Process which operates 24 hours per day 365 days per year. Wastes are accepted and finished products exported between 7.00 and 19.00 Mondays to Saturday.



## Organic Waste Acceptance and Characterisation Procedure

### Objectives

- Ensure waste processed on site is suitable for digesting and characterised correctly. Waste unsuitable for the Anaerobic Digestion process is identified, isolated and controlled.

### Responsibility

- Facility Manager
- Weighbridge Operators

### Procedure

- Before new waste is proposed to enter the site, preclearance is sought from the customer which must include, description, origin of the waste and analysis (if requested). The Environmental/Technical manager will determine the EWC code for the waste and its Animal by-Product status. An internal ABP classification form is filled out to classify the waste.
- Any additional information (e.g. analysis) is retained along with the classification form for reference purposes.
- Once preclearance is given, waste is allowed enter the site and is weighed in at the weighbridge.
- All receptacles (trailers/tankers etc) entering the site must be covered and sealed. Trucks are directed to the waste acceptance area. An operator then signals to the driver when it is clear to tip waste. The load is visually inspected to ensure that it is consistent with the details provided in the waste classification form and, assuming is consistent, is cleared to process.
- If the waste is not cleared to process because of suspected non-conformity with the waste classification form, the plant manager is informed immediately. Following an immediate assessment of the suspected non-conforming load, the plant manager will either pass the load for processing or direct the load to be reloaded and removed from the site.

All plant and machinery that come in contact with the waste will be thoroughly cleaned.

- Where a load is confirmed to be non-conforming, the non conformance and the corrective action record sheet (RS MC07) is filled in and all details and actions taken recorded in same.
- Once acceptance is completed, the weighbridge operator directs the driver to the weighbridge. The truck is weighed and a detailed receipt is given to the driver.

## **Waste**

Wastes generated on the site are disposed in a manner which will minimize the impact on the environment. A Waste Management Plan has been produced by NERGE Ltd. for the Operational phase of the development. This plan contains all details of the relevant details of the Permitted contractors designated for specific waste streams. A separate Construction Management Plan has been prepared for the Construction phase.

A register of all other wastes will be maintained on site, recording the date, volume and destination. A copy of these registers will be available on site for inspection by Cork County Council, the DOAFM and the EPA, and any other regulatory officials at any reasonable time.

## **Employment**

This development has the potential to provide for 2 full time jobs at the Biogas Plant and 1 part-time with indirect employment potential of 40-50 full time jobs in associated waste and biomass collection sectors. Planning for a sister project has being submitted to Cork County Council, for the development of a glasshouse facility adjacent to this site which will have an additional job creation potential of 20-40 direct job positions, while utilizing heat and CO<sub>2</sub> emissions from the anaerobic digester. The SWAT analysis has concluded that the glass house development is not sufficiently viable at this juncture.

## **Start-up, shutdowns, leaks, malfunctions, breakdowns and momentary stoppages**

Start up: During start up, the loading into the digester will proceed slowly. While doing so careful monitoring and control of the process are essential until the digester attains optimum conditions. Approximately 1-3 months are required to achieve a steady state digester.

Malfunctions, breakdowns and momentary stoppages: If the heat is turned off due to malfunctions, breakdowns and momentary stoppages, a typical digester will lose at least 0.50C to 10C a day if loading of feedstock ceases. Once the temperature has dropped to 280C, the gas production will reduce significantly. To start the digester up again, the contents should be mixed continuously, so there is no mat on the top, and then slowly warmed up again. This process can be used if the operator is in any doubt about contaminated feedstock: if feeding is stopped the digester will recover.

## **De-Commissioning/Life Span of Development**

All facilities of this type require a major capital investment every 15-20 years to keep them efficient and pleasant places to work. So long as this investment is made there is no reason that a facility of this type could not operate for up to 40 years. However, if for economic reasons or technical reasons this does not occur decommissioning will take place, the Closure, Restoration and Aftercare Management Plan prepared by NERGE Ltd. for the site will be implemented.