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ENVIRONMENTAL IMPACT ASSESSMENT
MARTIN O DONOVAN'S PIG FARM
COLLIGBOY, TIMOLEAGUE, BANDON, CO CORK
JULY 2009

ENVIRONMENTAL IMPACT STATEMENT

Relating to

Proposed 1750 Sow Integrated Pig Unit

AT

Cooligboy, Timoleague, Bandon
Co Cork

For

Mr Martin O Donovan
Cooligboy, Timoleague, Bandon, Co Cork

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1. NON-TECHNICAL SUMMARY

This EIS had been prepared by NRGE Ltd, with inputs from additional specialist environmental consultants, on behalf of Mr Martin O Donovan, who is the owner of this pig farm. The existing farm located to the south of the proposed site in Cooligboy, Timoleague, Bandon, co Cork (Grid Ref ITM No 545629, 544044), currently operates as a 1150 sow integrated unit. This plan proposes to convert this existing farm to a weaner and fattening unit, to be supplied with stock from the proposed sow unit 300m to the north in Cooligboy, Timoleague, Bandon, co Cork (Grid Ref ITM 545585, 544410), (See Attachment 1 for location maps.)

It is proposed by way of planning permission to Cork County Council, to increase the capacity of the farm to a 1750 sow integrated unit. The facility will conform to the highest standards. This development comprises of an activity in relation to which a licence, under Part IV of the first schedule to Environmental Protection Agency 1992 as amended by Protection of the Environment Act 2003, is required. The development will occupy a landscaped site of approximately 4.3 hectares, (10.62 acres).

The proposed buildings, feed system, animal handling systems and control system of the proposed development are considered state of the art, not only in Ireland but worldwide. The proposed development of this new breeding unit will include all these elements in the construction, development and operation of the farm. The design features of the new buildings have been arrived at by Mr Martin O Donovan and his team of consultants after extensive research in Europe and worldwide. This development represents the cutting edge of animal handling, feeding, and breeding technology.

This pig farm currently supplies its stock to Stauntons, which is a local processing facility, who have now made it clear that they will only be able to purchase stock from producers that are fully compliant with new animal welfare regulations, in the near future (See Attachment 14). The proposed works will increase the stock numbers on the farm, which are currently 1150 sows to 1750. The proposal will allow the farm to consolidate its position in a very competitive market environment.

The proposal will provide state of the art housing for the sow herd. The buildings which house the sow herd on the existing farm, are to be utilized for housing weaners, and fatteners.

The additional housing will support the continuing effort by the farm to comply with, not only Irish welfare regulations, but also ensuring continued compliance with UK and EU welfare, food and trade regulations associated with processing and with the retail trade.

It also provides additional employment to the area with the provision of 13 full time jobs which includes a manager, and a further 48 jobs in related industries and services.

The farm has planning permission and Environmental Protection Agency approval for the construction of an anaerobic digester (AD) on the site. In addition to this proposed development for the sow herd this new proposal also seeks to increase the size of the anaerobic digester to utilise all the pig manure to be produced under this

proposal. Cork County Council has already given permission for an AD plant under file Ref 031852. However a separate planning application will be submitted shortly to upgrade this design, to comply with the latest Dept of Agriculture & Food regulations.

The AD plant will produce heat and power for the site and can export a surplus amount of energy off the site. The resultant digestate from the AD plant will be applied to land as a fertiliser.

All clean water from the site, will be collected via the stormwater collection system (See Site Layout Plan, in Appendix 2), and directed into the monitoring point identified as SW2, which is marked on said drawing. This monitoring point will be visually inspected weekly, and sampled quarterly under the terms of the IPPC licence from the Environmental Protection Agency. All soiled water will be diverted into the adjacent pig manure storage tanks. Each of the proposed structures will have an independent leak detection system, with individual inspection chambers, which will be connected to a site inspection chamber.

An application for a review of the IPPC Licence will be submitted to the Environmental Protection Agency shortly.

The estimated annual production of pig manure from this pig farm at full stocking capacity will be 22,933 m³. All pig manure from the site will be processed in the AD plant. The plant will produce all the energy requirements of the site, will export the excess and will produce a digestate that is more suitable to apply as a fertiliser than the original pig slurry.

The application of animal manure/digestate to farmland is now regulated under S.I. No. 378 of 2006 and distribution of manure from this site will comply with those regulations. This facility is entitled to supply animal manure/digestate to any local farmer who wants it, and is obliged to record all dispatches from the holding and the farmers acquiring animal manure/digestate are obliged to record all consignments acquired and to use it in compliance with the regulations. Animal manure/digestate will not be supplied to customer farms between 15th October and 31st January in any year except with the consent of the local authority, or any other relevant authority. Outside that period, animal manure/digestate will be supplied from the site to a customer farmer, only in response to an order. Managed and used in this way, animal manure/digestate produced at this facility will not have any adverse impact on environmental parameters either inside or outside the site.

An Environmental Impact Assessment was carried out in support of this application. This entailed site surveys of water quality, hydrogeological surveys, flora & fauna assessment and assessment of archaeological impacts. Traffic levels were also noted. The customers lands selected where animal manure/digestate will be used are well drained. No contamination of surface waters with run-off waters containing high phosphorus content or contamination of groundwater with nitrate-nitrogen will occur. The impacts from traffic, noise and odours at the pig farm are insignificant after all practical steps have been taken to mitigate them. Pig manure or digestate will be applied using tankers equipped with low trajectory splash plate or the band spreading method.

A register of digestate quantities, date of delivery and name and farm code of landowner is maintained on site, for inspection by Cork County Council, and the EPA and the Department of Agriculture at all reasonable times.

The flora, fauna and habitats of the site were studied. See report included in Attachment 3. Flora and fauna will not be affected by this development. There will be no loss of habitat.

There will be no damage to any site of archaeological or historic interest as a result of the development. An archaeological report is included in Attachment No 4.

Disturbance of the landscape will be minimal during the construction period. The site will be suitably landscaped, with the planting of trees etc., in a manner sensitive to the environment.

There will be no negative effects on tourism in the area.

The development is located in an agricultural area and 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. A landscaping report prepared by Mr. Dermott Leahy is included in Attachment 5.

Effects of the development on air are insignificant outside the buildings and adjoining yards. The ventilation system will ensure that foul air is dispelled high into the atmosphere where it will mix with fresher air and thus minimise odour. Pig manure will also be moved fresh from the farm to the Anaerobic Digester, every 2-4 weeks, thereby further reducing emissions from the pig farm. The nutritional policy on the farm is based upon the most up to date research on reducing emissions, and these will continually be developed on site. Inserting the slurry tankers armoured suction hose in a fixed pipe in the walls of the pig manure tanks will minimise the effects of odour as will the use of a low trajectory splashplate and/or bandspreader, and adhering to the Code of Good Practice for Spreading of Slurry.

Noise levels from the development are unlikely to be a nuisance. The main sources of noise on the development will be at feeding time (10-15 minutes) and from feed delivery vehicles. However, at a distance of 100 metres from the development noise levels are not greatly above background noise levels.

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

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 nett result of this proposed development will be a reduction of existing impacts to the order of at least 50%, from the site and 80% from the application of digestate in place of pig manure to customer farms, should the proposed anaerobic digester be constructed.

2.0 Introduction

2.1 Relevant Regulations for Environmental Impact Statements (EIS)

The proposed development will result in the development of an installation that belongs in a class listed in Schedule 5 Part 2 of the Planning and Development Regulations 2001, and so the submission of an Environmental Impact Assessment is a mandatory requirement. This report follows the structure and protocols detailed in *Advice notes on current practice in the preparation of Environmental Impact Statements (EPA 2003)* and *Guidelines on the information to be contained in Environmental Impact Statements (EPA 2002)*.

The scale of the proposed development is above the threshold for Class 1(e) (ii) activity, "*Installations for intensive rearing of pigs not included in Part 1 of this Schedule which would have more than 2000 places for production pigs (over 30 Kilograms), in a finishing unit, more than 400 places for sows in a breeding unit or more than 200 places for sows in an integrated unit*"

The existing farm operates as an 1150 sow integrated unit. The proposed farm extension will operate as a 1750 sow integrated unit and accordingly requires the preparation of an EIS.

This statement is drafted with particular regard to Article 94 and Schedule 6 of the 2001 regulations, and is submitted to provide information which may be helpful to the planning authority in making its decision on the application for permission to construct this new farm extension.

2.2 National and EU Policy

The proposed development is in line with national policy, (i) as expressed by the Minister for Agriculture on 10/7/1987 in a development plan for the Irish Pig Industry (ii) as expressed in the Pig Production Group Report of 1988 and (iii) is in line with projected slaughtering of pigs at meat plants by the IDA, aimed at increasing the competitiveness of Irish pig meat in overseas markets. The Irish Government and the EC have updated Irish meat plants in accordance with national and E.C. policy, entailing the expenditure of large sums of money by the promoters and substantial capital grant-aid.

In 1997 Teagasc launched a plan (Development of the National Pig Industry) to increase pig production in Ireland from 3.29 million pigs in 1996 to 4 million by the year 2000.

A study of the pig industry to prepare a Development Strategy for the sector has been conducted in 2008 by the Teagasc Pig Production Development Unit. An extensive consultation process with all the main stakeholders was undertaken and the findings compiled into a draft report on the future of the industry.

The key issues facing the Irish industry are the competitiveness of Irish pig producers and how it compares to the industry in other European and international countries.

The report found that around 7,000 people are employed in the sector including about 1,200 on farms. Currently, close to 500 pig producers in Ireland produce 3.6 million pigs annually. The Irish industry exports approximately 60 per cent of its production and is worth €250 million annually. The report also states that pork is the

most consumed meat in the world accounting for 38 per cent of meat consumption worldwide.

During 2007 feed ingredient prices worldwide soared. Typically, feed accounts for about 70 per cent of the cost of producing a pig and high feed costs in Ireland require very efficient use of feed on the farm.

Having identified the strengths and weaknesses of pig production in Ireland, the report recommends actions to be taken by the various stakeholders if the viability of the industry is to be secured. Fundamental to the survival of the industry is the implementation, within a short timeframe, of an agreed strategy by stakeholders.

The immediate establishment of a small task force, representative of the industry and chaired independently, to implement the agreed recommendations of the report is proposed. Among the priority issues to be addressed will be the financial viability of the industry, competitiveness, especially feed costs and the issue of manure management in the context of environmental legislation.

....

The National Spatial Strategy (Section 5 Location of Development; Policies) recognises the importance of agriculture.

"The agriculture, food, forestry, fishing and aquaculture sectors and other activities in the natural resource sector have a key role to play as a primary economic basis for vibrant and diversified rural communities and the retention of the rural population."

Currently the Department of Agriculture and Food is providing grant aid for the construction of new animal houses, to help ensure compliance with new Animal Welfare Regulations. These are mainly governed thorough

- European Communities (Welfare of Calves and Pigs) Regulations, 2003. (S.I. No. 48 of 2003).
- European Communities (Protection of Animals kept for Farming Purposes) Regulations, 2000.
- Diseases of Animals (Protection of Animals during Transport) Orders 1995, 1997, 2001.

Guidelines have been issued from the Department of Agriculture in relation to animal welfare. A copy of the Government produced Pig Welfare booklet is attached in Attachment 6. This booklet sets out the requirements that all pig farms must have in place. It also details the timescale involved. Also attached in Attachment 7 is the UK DEFRA Guidelines in relation to Pig Welfare.

This extension will insure that this unit will conform to both of these guidelines and help to ensure the viability of the unit both in the Irish market and the UK market.

The Department of Agriculture is also providing grant aid to improve facilities, structures, and equipment to ensure compliance with the Nitrate Directive Regulations.

2.3 Policies of Cork County Council

The Development plan for Cork County Council has recognised the importance of the contribution of agriculture to the rural economy of Cork. Chapter 4 of the plan says that,

“Economic development and growth is dependent on job creation. A key element of the employment strategy of this development plan, as outlined in Chapter 5, is the identification of a hierarchy of employment centres that will facilitate a more sustainable pattern of economic development across the County. These employment centres will be located within the existing pattern of settlements. Most of the main towns in the County are classified as District Employment Centres. Local Employment Centres will operate in more rural areas at the level of key village and village. Rural Employment areas are also recognised and include sectors such as agriculture, tourism, mineral extraction, commercial fishing and rural industry..”

This development secures an economic input to the local agricultural environment. The development will insure that the current activities on-site remain sustainable and will contribute greatly to the quality of the countryside.

Policy ECON 1.1(a): Employment Growth and Promotion

It is an objective generally to encourage all forms of economic and employment development throughout the County in response to the policies and objectives contained within the National Spatial Strategy, the Regional Planning Guidelines, the North and West Cork Strategic Plan, the CASP Update 2008 and in accordance with the overall development strategy and objectives of this plan

This development will provide 7 additional jobs to the 6 that are currently on-site. It will also provide 48 in-direct jobs to people in service and processing industries.

The relevant Council Policies in relation to agriculture and agricultural development are as follows

Development Plan Objectives: Diversification of Farm Employment	
ECON 5-1	<p>Rural Diversification</p> <p>(a) It is an objective to encourage diverse on and off-farm employment activities such as processing of agricultural produce, manufacturing of crafts and specialist farming (horticulture, organic, market gardening, flowers)</p> <p>(b) It is an objective of this plan to recognise and develop the full potential of biomass for energy production and support development initiatives in the bio-fuels sector.</p>

Development Plan Objectives: Agricultural Farm Buildings	
ECON 5-3	<p>Existing Farm Units It is an objective to support the development of existing farm units</p>

Development Plan Objectives: Nitrate Vulnerable Zones	
ENV 6-8	<p>Protection from Nitrate Pollution It is an objective to protect waters from nitrate pollution in accordance with the Nitrates Directive (91/676/EEC) as transposed into Irish Law by the European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2006 (SI 378 of 2006).</p>
ENV 6-9	<p>Developments Relating to Agricultural Industry It is an objective in assessing proposals for agricultural development that developments shall comply with the European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2006 (SI 378 of 2006).</p>

This development is vital to ensure the viability of this farm and to ensure it's competitiveness in the Irish and UK markets. The pig industry is in a poor state in Ireland at the moment and major rationalisation is on-going. This development is vital to ensure that this farm survives the rationalisation process.

The plans and documents submitted as part of the planning process show a level of input that will ensure that the development will minimise its environmental impact. The building and layout are state of the art for the industry. Effective and well designed landscaping will further minimise the impact.

All new storage facilities will have leak detection systems in place to ensure that no threat to surface or groundwater exists.

All pig manure generated will be treated in the AD plant on site and the resultant digestate will be recovered on agricultural land in accordance with nutrient requirement and in full compliance with S.I 378 of 2006.

The development of the digester associated with this development will provide the The use of the digestate in this development will reduce the use of artificial fertiliser in the area

2.4 Organisation and Bodies Consulted.

The scoping exercise of the EIS was carried out in line with previous planning permissions to Cork County Council.

Other organisations and bodies consulted include: -

Geological Survey of Ireland

Met Eireann
Central Fisheries Board
Office of Public Works
Department of Agriculture
Department of the Environment
National Parks and Wildlife Service
Teagasc, Johnstown Castle
Environmental Protection Agency
Local stakeholders adjacent to the farm were also consulted.

3 Description

3.1 Overall Description

This proposal is for an extension of the existing facility which has the capacity to accommodate 1150 sows in an integrated unit. The new development will allow for a capacity of 1750 sows, housing the fatteners in the existing farm, and developing a specialised sow breeding unit for the sows, the subject of this planning application.

The existing unit and the planned development are state of the art for the industry. The unit is fully integrated and it designed for minimum animal handling and maximum yield.

It is also proposed to increase the size of the AD plant previously permitted to accommodate the increase in pig manure produced on the farm. This issue will be covered by a separate planning application to be submitted shortly

A revised IPPC licence will have to be issued as a result of this development. It is planned to submit this IPPC License application shortly for review.

3.2 Size and Scale of the Proposed Development.

The size and scale of the proposed development have been chosen after consideration of such matters as the site, economic viability and labour efficiency. It also included consultation with all stakeholders.

In full production the pig population at this site will comprise at any one time 1750 sows in a fully integrated unit. Pigs will be slaughtered at whatever the market dictates, but normally between 75 and 110 kg

Drawings of the proposed new structures are presented in Appendix 2. A farm structure table is show in Appendix 2

3.3 Siting, Design, Construction and Structural Details

The proposed development is situated 300m to the north of the existing pig farm. The site is well located being accessible by local routes but remote from any built up area.

The additional housing will support the continuing effort by the farm to comply with not only Irish welfare regulations but also ensuring continued compliance with UK and EU welfare, food and trade regulation associated with pig production, processing and requirements of the retail trade.

The farm has planning permission and Environmental Protection Agency approval for the construction of an anaerobic digester (AD) on the site. A separate planning application will be submitted shortly, to alter the design of this AD plant to comply fully with recent Dept of agriculture & Food regulations, as well as an increase in capacity to treat the increased pig manure volume. The AD plant when constructed will utilise all the pig slurry generated on the site, to produce heat and power for the site and to export a surplus amount of energy off the site. The resultant digestate can then be applied to land as a fertiliser.

A digester is simply 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, attack 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/or 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 regard to care taking of 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

- The pig manure produced on this pig farm will provide the majority of the required fuel for this anaerobic digester
- The additional feedstock required will be sourced, and transported to the facility by lorry, at a rate of 4 - 5 loads per week.
- The gas generated will be used to supply power for the pig farm, and heat, replacing oil usage.
- The excess power will be exported.
- The solids will be separated, including 70-80% of the P.
- The liquid fertiliser will be used on customer farms, in accordance with a fertiliser plan.
- The odour impact of spreading digestate vv pig manure will be reduced by 80% min.
- The digestion process will destroy 98% of all pathogens & parasites.
- The digestate is relatively stable, and will not produce a crust in storage.
- The digestion process will kill all weed seeds.
- The digestate is a pleasant, clean and easy material to handle.

Description of the Anaerobic Digestion Process

The estimated annual production of pig manure from the unit at maximum capacity is 23,000 M3.

It is planned to import an additional 4,000 tonnes of additional material of organic feedstock material per annum to mix with the pig manure to increase the efficiency of the proposed Anaerobic Digester. These organic materials are all materials which are currently land spread in accordance with a Nutrient Management Plan. The materials proposed are within the MBM subsection (Manure, Bellygrass, and Milk) of the Animals By-products regulations consisting of Dairy Processing Sludge, Bellygrass (Stomach contents from slaughtered animals). This organic material will be added directly to the mixing tank.

As the proposed development does not have the necessary permits and compliances firm intentions to supply waste streams have not been agreed, suffice to say that by their nature the products identified as suitable co digestion feedstock are from food processors who have IPPC Licenses. It is important to note that the maintenance of Customer Confidence in the final Digestate to be used as a fertilizer is a primary objective of the development.

The C:N Ratio of the proposed feedstocks have slightly elevated Nitrogen levels when compared with Pig Manure, however when mixed with the manure produced on the farm the nitrogen level in the total feed stock are only slightly elevated and are will within the tolerance band for nitrogen.

All pig manure will be diverted fresh to the mixing tank where other organic materials will be mixed, and pumped at regular intervals to the anaerobic digester for gas production. The resultant digestate is then pumped to a centrifuge for removal of solids, with the final liquid odourless digestate, transferred to the covered storage tanks, for export to customer farms as fertiliser.

The organic material from the materials tanks will be transferred to the mixing tank at a 1:9 ratio to pig manure, having taken account of any deliveries directly into the mixing tank. The organic material will be transferred using a shaftless screw conveyor. The mixing ratios will be achieved by operating the screw on a timer when the required quantity of pig manure has charged to the mixing tank. Charging of the mixing tank with manure can only take place when the low level probe has been activated. Consistency of feed to the digester is achieved by a measured volume of manure charged to the mixing tank between the high and low level probes and a measured volume from the reception pit screw. The homogenised digester feed is pumped to the digester at regular intervals, controlled by computer. A meter will be installed on the line from the mixing tank to the digester. Liquid fatty material such as fish oil can be pumped directly into the digester from these material storage tanks adjacent to the plant room, a meter is also installed on these lines. The frequency of pumping to the digester is governed by gas recovery rates monitored by the computer control system both on the site and remotely at the control room of the equipment suppliers.

The operating temperature within the digester will be 55 degrees (Low Temperature Thermophilic Process) and a mechanical agitator will be affected by gas release. The digester will be constructed from Mild steel with the necessary heating coils fixed outside the digester walls. 100 mm insulation and weather cladding will be fitted to provide weather protection. The expected holding time in digester is fifteen days approx. Gas extracted from the digester will be diverted to the gas storage tank which will be located on top of the secondary digester, after passing through a gas purification unit to remove sulphur. After digester one the feedstock will be transferred to digester two where again the through put time will be fifteen days approx. The secondary digester will not have heating coils around the circumference of the digester.

Collected gas from digester two will be transferred to the gas storage tank also passing through the gas purification system which incorporates a condensate well to reduce the moisture content of the gas. The excess moisture from the condensate well will be discharged to the digestate basin. The gas purifying system is only intended to reduce the H₂S content in the biogas. The main purpose is to protect the engine, the second purpose is to lower the SO₂ content in the exhaust gas (and also the H₂S content in the exhaust gas as there will always be smaller parts of uncombusted H₂S in the exhaust gas; with a H₂S content in the purified gas at 400 ppm the content in the exhaust gas will be 1.09 ppm).

The gas purifying system does not influence the NO_x content in the exhaust gas, as the NO_x content is dependent on the combustion temperature.

Normally the H₂S content in the biogas before the gas purifying is 2000-2500 ppm.

The gas purifying system is based on microbiological activity. The micro organisms colonise plastic balls with a high surface area within the gas purification tank. The sulphide oxidising micro-organisms use carbon dioxide from the biogas to cover their carbon need. The products formed are predominantly elementary sulphur but also sulphate, which will be discharged to the digestate basin. For the microbiological oxidation of sulphide it is essential to add specific amounts of oxygen with a minute quantity of manure to the biogas. Depending on the concentration of hydrogen sulphide 2-5% air is added to the biogas. The quantity of air is monitored by the gas

meter on the biogas digester and an oxygen meter on the outlet from the gas purifier to control the air quantities supplied by pump to the gas purifier.

A dual membrane gas storage dome will be constructed. The construction will comprise of a rolled angle flange constructed on top of the existing tank. The gas tight membrane will be placed between the flanges and clamped. A blower unit will maintain the air pressure between the membranes constant allowing the accumulation of biogas under the inner membrane to be maintained at a level slightly higher than the air space between the membranes usually 0.5 bar. The gas storage unit is an atmospheric pressure bag type gas collector contained within the dome. The gas will be piped to the engine-boiler room.

It is proposed to install one gas engine coupled to a generator developing approximately 300 KVA. The proposed Model is a GE Jenbacher J 316 GS. Hot water from the engine will be passed through a heat exchanger to provide heat for the digester process and the excess heat will be used within the pig unit. There will be additional heat available for possible alternative heating in the area. A dual fuel boiler 250 KW capacity will also be installed in the shed. This boiler will provide the heat for the process when the system is initially started and to maintain the heat on occasions that the gas engine is out of service.

After digester two the digestate will be transferred via sealed pipe system to a centrifuge. The fibrous material is removed and transferred into a storage skip. The liquid digestate will be transferred to the adjacent overground storage tanks, via a sealed pipe system. The pipework throughout the digestion process from mixing tank to the centrifuge will all be mild steel pipe. The pipework from the centrifuge to the digestate basin will be uPVC Pipe.

The following is a HACCP plan for the proposed AD unit

CCP No. 1 Daily checks

- Check all lids and covers are sound and closed after daily feed completed
- Check that all areas are clean after feeding
- Check visually that all gauges and automatic controls are working
- Check visually and audibly that digester mixing is working correctly
- Check that digester temperature is correct
- Check the pasteurisation recording system
- That daily log book is filled
- That gates are closed and locked after visiting the site

CCP No. 2 Weekly checks

- That pipes, pumps, valves and tanks are sound
- That reception area drains are clear
- There is no sign of vermin, if there is take remedial action
- That level monitors are working correctly
- That fences and gates are in good order

CCP No. 3 Areas classified as dirty

- Reception areas during reception of wastes and until washed and clear of debris after delivery
- Dirty clothes store
- Storage tanks for untreated waste
- Site dirty water collection tank and dedicated pump

- All equipment used pre-pasteurisation
- Pasteurisers before pasteurisation process is completed

CCP No. 4 Areas classified as clean.

- All areas and equipment not classified as dirty, in particular, pasteurisers after pasteurisation is complete and all equipment post pasteurisation
- Long term digested liquid storage tank and pump and pipework to the long term store
- Fibre storage shed
- Control area

CCP No. 5 Managing risk of cross-contamination between clean and dirty areas.

- Operatives will wear designated dirty clothing when receiving deliveries of non farm material, operating and maintaining dirty equipment or otherwise working in dirty areas or with dirty equipment
- Operatives when dressed in dirty clothes will not travel into clean areas
- All vehicles that pass into dirty areas will have their wheels washed at wash point beside mixing tank before leaving that area
- All delivery vehicles will unload over an area designated as dirty and have any debris from the delivery washed off before leaving the dirty area
- The cover over the mixing tank must be kept closed after delivery of organic waste into it.
- Any splashes created during delivery, feeding or maintenance will be washed down immediately after operations are completed
- During maintenance and servicing of dirty equipment care will be taken to ensure that any waste material contained in them is cleaned out into other dirty areas.
- All dirty areas drain into the dirty water collection tank. The contents of this tank are transferred by dedicated pump and pipes into the feeding system for the digester and pasteuriser system
- The pasteuriser will not be emptied unless it has achieved the correct time and temperature parameters

CCP No. 6 Deliveries of waste material

Incoming organic materials will be received to pre mix tanks and storage tanks on site will be covered. All materials entering this proposed development will be immediately transferred into the concrete circular mixing tanks, or the overground PVC coated insulated stainless steel tank.

The development has a number of feed stock storage tanks, Four of these are vertical overground tanks which will be equipped with external 100mm diameter fixed filler pipes connected to the top of the tank as per drawing No 004 submitted with the planning Application. These tanks have a capacity of 50m³ and are suitable for liquid type waste fatty streams which have a relatively low viscosity when warm or oily type streams which will be in accordance with the approvals from the Animal By-products Section of the Department of Agriculture. Filling of these vertical tanks will be by positive displacement pump fitted to the delivery vehicle and a flexible pipe to couple to the fixed filler pipe. The air displacement from within the tank will equate to the volume of feedstock delivered maximum 27m³ and this will disperse quickly. An isolating valve and coupling cap will be fitted to the fixed filler pipe and remain closed when the tank is not being filled.

The underground feedstock tank is a concrete constructed tank with an infill hopper and concrete apron in front of it so that vehicles delivering more solid type waste streams such as belly grass and flotation sludge can tip directly into the hopper. The intake hopper will be maintained under negative pressure, by a 300m³/hr fan

capable of 3 air changes per hour and exhausting the air through a bio filter located on top of the mix tank. The arrangement of the tank, intake and biofilter are shown in attached drawing no 303.

The requirement of the Department of Agriculture APB Section for washing of vehicles and the surrounding tipping apron to be contained in the mix tank. This is one of the main methods of mitigating odour by keeping the intake hopper washed and the concrete apron washed.

All reception areas have concrete surfaces and drain into the collection tank. Care will be taken to ensure that

- all personnel that will oversee the delivery dress in clothing (boots, gloves and boiler suit) that are dedicated to such purpose
- the collection tank is empty before delivery commences
- a delivery vehicle parks in such a way that the unloading point is over the concrete reception area.
- all hoses are sound and connected and positioned correctly
- there is sufficient space in the reception/storage tanks to receive the material
- that vehicles are free of debris after delivery is complete
- that any spillage is cleaned immediately after delivery, by shovel either directly into the reception pit, and by washing down
- wash footwear and gloves, if contaminated, on reception areas
- pump empty the collection tank into reception pit after delivery and washing down
- all lids on tanks are closed
- remove dedicated clothing and place in store or take overalls for washing if necessary

CCP No. 7 Records

- All waste from non farm sources will only be taken for treatment if it has a delivery docket, which states the date, the quantity and type of waste and provides the name and address of source of the material and the transport company, and is signed by an authorised person from each.
- A waste register is maintained on site for all deliveries of non farm waste. This register records;
 - All deliveries of farm waste to the facility including the date, the type and volume of material, and who delivered it to the facility
 - Volumes of non-farm waste received by the facility
 - Daily feed volumes
 - Amount pasteurised each day
 - Volumes of fibre removed from site, and on what date, by whom and to where
 - Amounts of liquid fertiliser removed from site, by whom, on what date and to where
 - Details of any analysis of material that is undertaken or provided
 - Details of any materials (time, quantity, type, how and to where) other than the processed
 - products that have to be removed from the site

A process log book will be kept which will record

- that all procedures during reception of waste and feeding the digester are maintained
- that daily and weekly checks have been carried out
- process observations
- changes in method of process management
- any remedial action that was taken at any time
- details of when, where and type of vermin if found and the remedial action taken

CCP No. 8 Vermin control policy

No waste will be left in any location where vermin can access.

Any spillages that occur will be cleaned immediately

Visual checks will be carried out weekly to see if there are any rats on the site, if any sign is apparent then poison or other methods to remove them will be undertaken.

CCP No. 9 Ensuring particle size and pasteurisation has been achieved

This procedure will be formulated when final recommendations are supplied by the Dept of Agriculture and Food.

CCP No. 10 Contingency plans for digestion process difficulties or failure

Chemical contamination (e.g. high level of bleach) of the feedstock can cause process problems.

Waste will only be taken from regular and reputable suppliers, who have been made aware of the important issues regarding waste quality. However if a bad batch does get delivered without notice, the action to be followed will vary with each site.

- If the digester is given time to recover and the temperature is maintained generally the process will continue and soon return to normal performance.
- The contaminated waste can then either be returned to the supplier for them to deal with or possibly could be fed to the digester at a diminished rate.

Process failure

It is most unlikely that there will ever be a complete process failure if the feedstock contains a larger proportion of farm waste than off farm waste. This is because the bacteria in the process occur naturally and a wide variety of bacteria families are present in animal manures. Therefore generally if the digester continues to be fed slowly with the farm waste it will recover in time.

Loss of performance in process

This would result in a decrease of gas production from the digesters. Therefore there must be an alternative source of heat for the pasteurisation process other than that created by using the biogas

CCP No. 11 Security of the AD facility site

The site will be suitably fenced.

Animal intruders

In the unlikely event of any animal breaking into the facility area, there would be no risk of harm to the animal as there is no place they could have access to the waste and all tanks and roofs are constructed to withstand the weights and pressures that could be exerted by an animal, and all surface areas would be clean.

Human intruders

It is always possible, regardless of what measures one takes, that human intruders may access the facility. Therefore the best method of managing this risk is to keep all surfaces clean of waste material, so that walking over the site should not create a problem.

CCP No. 12 Areas of potential risk and how this risk will be managed (not already mentioned above)

- *Damage to the tanks by vehicles*
- There will be a wheel stop for vehicles backing up to the off-tipping tank, and the materials tanks 1, 2 and 3.
- All vehicle movements at the facility will be supervised
- *Burst pipes – visual checks and quantity monitoring*
- *Valves being opened at the wrong time*
- Experienced operatives only will operate the facility and each operation will be double checked before commencement
- *Valves being left open after use*
- The operative will stay at the facility for at least 10 mins after completing the days operations and before carrying out the final check that all is in order.
- *Tank over-filling*
- The first fail safe is the level controls and indicators. The second fail safe is visual observance. The third failsafe is that any overflow from the tanks will drain into the mixing tank.
- *Biogas leaks*
- Weekly checks of all pipework will be carried out. Biogas is a very smelly gas and is quite noticeable if escaping, so a smell of gas at the facility would alert one. The risk of explosion from any escaping biogas is very low, however the areas where there is a potential risk of a gas leak should be designed to always have good air movement

CCP No 13. Record keeping

- Deliveries to and collections from the site
- Thermographs of the pasteurisation process
- preventative measures against vermin
- Cleaning procedures and inspection schedules and results
- Equipment maintenance and calibration
- Sampling procedures, schedules and results
- Traceability system for all processed goods
- HACCP plan and report

It is also proposed to replace the existing the over-ground pig manure storage tanks, with an engineered covered storage basin. Details of siting and design are shown in Appendix 2.

3.3.1. Construction Details

A site location map and planning notice and site plans giving the full construction details are provided as part of Attachment 1 and 2.

3.3.2. Design

In arriving at an overall design of new buildings, consideration is given to colours of external facing materials to ensure maximum compatibility with the surrounding landscape. Also, features such as minimising ridge heights are an important element of the design process.

The buildings, feed system, animal handling systems and control system of the proposed development are considered state of the art, not only in Ireland but worldwide. The proposed extension to the unit will include all these elements in the construction, development and operation of the farm. The design features of the new buildings have been arrived at by the developer and his team of consultants after extensive research in Europe and worldwide. This development represents the cutting edge of animal handling, feeding, and breeding technology. This unit is seen internationally as a leader in these design techniques.

Each of the proposed structures will have an independent leak detection system, with individual inspection chambers, which will be connected to a site inspection chamber.

3.4 Co-product and Waste Production.

The co-product produced is pig manure, which when treated in the proposed anaerobic digester will be classified as digestate. The wastes produced are animal carcasses, foul water, odour emissions, veterinary waste, and general refuse.

3.4.1 Types and Quantities of Co-product and Waste

The major co product from the proposed facility is pig manure; the yearly production of which amounts to 23,000 if the unit is in full capacity. This includes a figure for wash water as detailed in Table 1 and 2 below.

It is intended that all pig manure will be diverted fresh to the proposed anaerobic digester to produce digestate, for export to customer farms as fertiliser.

Table 1 details the current amount of slurry produced at current stocking levels, while Table 2 shows the expected volumes under this proposal.

TABLE 1: Current stocking levels

PIG TYPE	NUMBER OF STOCK	NEAT excreta Pig/week (litres)	Total Litres	Total M3
Farrowing Sows	215	97	20855	20.86
Dry Sows	935	43	40205	40.21
Boars	15	35	525	0.53
Gilts	165	35	5775	5.78
Weaner	4600	12	55200	55.20
Fattener	5900	24	141600	141.60
Total Pig Manure per week			264160	264
Total Pig Manure per annum			13736320	13736
Extreanous water 5% & 8% other			880000	880
Total annual production pig manure			14616320	14616

TABLE 2: Proposed stocking levels

PIG TYPE	NUMBER OF STOCK	NEAT excreta Pig/week (litres)	Total Litres	Total M3
Farrowing Sows	528	97	51216	51.22
Dry Sows	1222	43	52546	52.55
Boars	15	35	525	0.53
Gilts	280	35	9800	9.80
Weaner	7000	12	84000	84.00
Fattener	9000	24	216000	216.00
Total Pig Manure per week			414087	414
Total Pig Manure per annum			21532524	21533
Extreanous water 5% & 8% other			1400000	1400
Total annual production pig manure			22932524	22933

3.4.2 Animal Carcasses

The anticipated number of animal carcasses for disposal due to mortalities on an annual basis is estimated as follows:-

Sows	@	4% =	78
Piglets	@	8% =	3820
Weaners	@	1.5% =	790
Fattening Pig	@	1% =	500

Carcasses are stored in a covered sealed metal skip prior to transport by an authorised waste collector. They are transported for disposal at a licensed rendering plant. This is carried out in accordance with the IPPC licence that is in place for the unit. Records of collections are available on the unit.

Other Wastes

Other wastes from the farm include general waste and veterinarian waste. The estimated amounts of these waste types to be produced on this proposed unit are set out below in tabular format:

Waste Type	EWC Code	Estimated volume
Pig Carcasses	02 01 02	60 Tonnes
Veterinary Waste	18 02 02	10 Kgs0
General Refuse	20 03 01	8 tonnes

3.4.3 Air Emissions

This development ensures that continued reduction of air emissions from the unit is implemented. This issue was discussed in a report prepared by Odournet UK Ltd, in 2001 titled "Odour Impacts and Odour Emission Control Measures for Intensive Agriculture Part A Odour annoyance assessment and criteria for intensive livestock production in Ireland", which was commissioned by the Environmental Protection Agency, wherein section 9.6 page 69 it states "that a reduction in odour emission is not likely to be greater than 50% and more likely to be in the order of 25-30%" by reducing crude protein levels in the diets. Emissions from open slurry storage tanks are also discussed in section 9.9 page 74 wherein it states that ammonia emission reductions of 70-80% have been achieved by covering open tanks. Removal of pig manure from this facility at present is by tanker armoured suction hose inserted into the tank with minimal odour release. The house and ventilation design is state of the art and designed to be low odour emitters. The odour impact of the development will not be detectable beyond 100 metres from the houses.

The development of the proposed anaerobic digester on an adjacent site proposes that all pig manure from this farm will be utilised to produce gas via the anaerobic digester, and transferred to adjacent covered storage tanks, after separation of solids, from where the odourless digestate will be exported to customer farms as liquid fertiliser. Odours that can arise during land spreading of the pig manure will be eliminated by this technology.

Emissions from the farm are currently contained using the following recommendations;

1. Reducing uncontrolled air movements on site and leakage from the ventilation system and from pig houses (i.e. windows and doors)
2. The use of a high-tech computerized ventilation system, in animal houses with a back up system.
3. Minimising the generation of odours during meteorological conditions which favour spread of odours.
4. The storage of carcasses in covered sealed containers on site.
5. A 100 mm buffer is maintained at the top of all covered pig manure storage tanks to allow for the accumulation of gases.
6. Minimisation of the agitation of pig manure and the filling and emptying of liquid storage tanks from below the surface of the stored manure.
7. Transporting pig manure in suitably contained leak proof vehicles.
8. Limited areas where pigs are moved outside buildings, and covering of passageways and yards where animals have access.
9. Use of low protein diets to all animals on site has reduced emissions on site by 30%.
10. Continued incorporation of low protein diets on site in line with recommendations from Makeway Ltd. It is estimated that 30% reductions have already been achieved, in line with recent research.
11. All pig manure will be delivered fresh to the proposed anaerobic digester within 2-4 weeks of production, thereby greatly reducing emissions from under floor storage tanks. The fresher the pig manure is delivered to the digester the greater the gas production levels that will be achieved. Removal of pig manure regularly from the storage tanks under the pig houses will effectively qualify these houses as low emission housing. This process is described in detail in a document that is publicly available on the internet, at <http://www.infomil.nl/luch/index.htm>.
12. The development of the anaerobic digester will negate the requirement of agitation of raw pig manure in open storage tanks, which is a major source of emissions from this site 4 existing over-ground storage tanks. Odournet UK Ltd who have acted as the Environmental Protection Agency's experts on a number of sites to date have referenced in a report prepared for another pig farm that "The specific emission rate of an open storage tank, is assumed to increase from $150 \text{ ouE} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$ to $500 \text{ ouE} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$, when the slurry is being agitated" this is stated in page 10. Section 2.2, of a report prepared by Odournet UK titled 'Review of Odour impact of two pig production units and options for improvement'.

3.5 Pig Manure/Digestate Use Proposals

It is proposed to supply all the pig manure from this facility as fuel to the proposed anaerobic digester, for gas production. After digestion, the solids will be separated containing approx 70-80% of the P content. This material will be suitable for supply to a nursery, garden centre, or alternatively to fertilise an agricultural crop with a high P demand (e.g. Beet or maize). The remaining digestate will be exported to customer farmers operating in the hinterland, who are currently customers for pig manure, in accordance with Nitrate Directive Regulations (S.I. No 378 of 2006). Odours that arise currently during application of pig manure will be reduced by 80% approx by this proposal.

3.5.1 Digester Output Volumes

	Digestion Feedstocks m3
Pig Manure (From Table 2 Proposed Stocking Levels Section 3.4.1 of EIS)	23000
Dairy Sludge	3000
Belly Grass	500
Biofuel Residue(Rape Husks, Glycerine etc)	300
Food Wastes(Feedmill Wastes Ect)	200
Total	27000
 Volume reduction from Gas Generation	 2700
 Solid Fraction from Separation	 2500m3
Liquid Fraction for Land Application	21800m3

3.5.2 Digestate Storage Proposals

The Liquid Fraction of the Separated Digestate will be stored in the Geomembrane lined manure Storage Basins indicated on the site plan as No 001B. These provide sufficient storage for Digestate for 6 Months in accordance with the code of Good Agricultural Practice. The Storage basins are covered this has a double benefit, firstly it prevents the ingress of extraneous water to the final digested manure and secondly it prevents the evaporation of ammonia from the liquid Digestate rendering it available for plant uptake when spread.

The separated solid fraction will be collected from the decanter separator by container or Tipping Trailer and either loaded directly to Road Vehicles of up to 60m3 capacity for direct outloading to customers for both agricultural and non-agricultural use such as peat substitution in composts, land remediation or placed in the fibre store.

The fibre store is a Portal Frame Store of a nominal size with the capacity to store 6 months capacity of Fibrous Digestate.

3.6 Pig Manure Tankers Owners and Available

The developer will engage a professional contractor to supply a tanker for the purpose of delivering the digestate/slurry to customer farms in the area.

3.7 Requests to Use Pig Manure/Digestate as a Fertiliser

This facility will supply digestate to customer farmers in the area, upon request, and all deliveries will be documented on site. A copy of this register format is included in Attachment 8 and same will be available on site for inspection by North Tipperary County Council, and Agency inspectors and the Dept of Agriculture. All customer farms are now required to comply with the Nitrate Directive regulations (S.I. No. 378 of 2006), and will thereby have to record these manure imports on site. A composite map of existing customer farms is included in Attachment 9 on a map scale 1:50,000. A copy of S.I. 378 of 2006 is also included in Attachment 10.

3.8 Details of Services Required

The estimated daily water requirement of the unit in full production is 57 m³. Two bored well provides water and these wells have sufficient capacity for the new development. 2 No additional groundwater monitoring wells will be installed adjacent to the proposed development, which will duplicate as back up wells to supply. Full details are provided in the Groundwater and hydrogeological Assessment included as Appendix 11.

A 60 KVA transformer, adjacent to the site provides electricity supply. A generator on site provides the back up supply with a 70 KVA capacity. When the anaerobic digester is constructed there will be a biogas CHP unit on site with 800 KVA capacity

3.9 DETAILS OF FEEDSTUFFS

About 145 tonnes of a balanced feedmix will be consumed on the unit by all animals on site. The feed is bought in from a milling company in bulk. These diets are formulated on a best mix cost basis using the typical following raw materials (barley, wheat, soybean meal, sugar beet pulp, pollard, soya oil, molasses, minerals and vitamins). All feeds are prepared on a best mix protein basis.

All pigs have access to drip free nipple drinkers.

Copper is added to the meal mixture at the rate of approx. 0.5 kg of copper sulphate (CuSO₄ 5H₂O) per tonne of meal for growing and finishing pigs. This gives rise to pig manure with a copper content of 30 mg/L. It is not proposed to supplement the meals with zinc.

3.10 Maximum Soil Contaminant Concentration

The pig manure currently applied, does not add any contaminant to the lands where it is utilised as a fertiliser. The elements in the pig manure comprise chiefly carbon, oxygen, hydrogen and nitrogen with lesser amounts of phosphorus, sulphur and copper. At an application rate of 15 m³/hectares, the application rate of 0.45kg/hectare Cu is less than 3% of that permitted in EC Directive 86/278 on the application of sewage sludge to agricultural land. Pig manure from the existing pig farm is recovered as fertilizer in accordance with a Nutrient Management Plan approved by the Environmental Protection Agency. A copy of correspondence issued by the EPA approving the NMP report for 2009 is included in Attachment 15.

The use of the anaerobic digester on site will greatly reduce the nutrient content, and environmental impact of the digestate to be spread as liquid fertiliser on customer farms.

4 Description of Alternatives Considered

4.1 Alternative Sites Considered

As the farm is already in operation at the site, no alternative sites for this proposed extension were considered.

4.2 Alternative Site Layout and Designs

Alternative site layouts and designs were considered. The optimum depth of tank was decided upon on the basis of air draughts, capacity, emission reduction and costs etc. Generally the most economical and efficient layout for pig production and pig movement was designed for, with a view to reducing environmental impacts, and providing a safe and healthy environment for staff and livestock. The proposed development is situated adjacent to the site of an existing pig unit facility. The site is well located being accessible by local routes but remote from any built up area.

4.3 Alternative processes considered

There is no other satisfactory alternative process for pig production. The anaerobic digester will utilise the pig manure from this pig farm to generate gas. In the process solids will be removed including 70% of P. The digested material is stabilized by the process so it is almost odour free. Much of the carbon has been removed from it and has been homogenized during the process so it becomes thinner and of an even consistency and the nutrient it contains has become plant available so it is a valuable fertiliser. The method proposed (low trajectory splash-plate/band spreading) is very practicable for applying this product. The use of low emission housing designs, and covered storage basin, along with the use of low protein diets on site will greatly reduce emissions from this pig farm, which could be further reduced by the export of pig manure within 2-4 weeks of production to the anaerobic digester.

5 Description of Existing Environment

5.1 Location of Structures

The site location map (Ordnance Survey map sheet No 123 County Cork) is included in Attachment 1. The unit is located in the townland of Cooligboy approx. 2 km from Timoleague, via the public roadway, and is set at an elevation of 130 m approx. This facility is located in a wholly agricultural area.

5.2 Deliveries to Customer Farms of Digestate

The application of animal manure/digestate to farmland is now regulated Under S.I. 378 of 2006 and distribution of manure from the site will comply with those Regulations. The Applicant is entitled to give manure to any local farmer who wants it and is obliged to record all despatches from the holding and the farmers acquiring manure are obliged to record all consignments acquired and to use it in compliance With the Regulations. A composite map of existing customer farms is included in Attachment 9.

Animal manure produced in the existing facility is currently distributed to local farmers in response to their demand and for their use on their farmland. The manure that would be produced by animals to be housed in the proposed development would after passing through the AD plant, be similarly distributed. Local demand for pig manure is buoyant. The applicant has more customers and more demand than can be satisfied from the existing herd. The applicant is entitled to supply it to his customer farmers who want it and are not prohibited from using it. The use of animal manure/digestate to fertilise farmland is subject to statutory control under S.I. 378 of 2006.

Manure/digestate from the site would be supplied in response to customer farmers' demand and in compliance with law. The calculation of expected manure production is discussed elsewhere in this report, and the manure storage capacity is calculated on the Farm Structures Table in Attachment 2.

5.3 General Description of the Existing Environment

5.3.1 Land Use and Cropping History

The lands whereupon it is proposed to use pig manure and digestate consist mainly of grassland, for grazing / silage production and tillage. Farm management standards on all these farms are good.

5.3.2 Water Quality Analysis

Water samples are taken annually from the two wells currently supplying the unit, and the analyses results from an independent laboratory are set out overleaf. In addition the stormwater monitoring points are inspected weekly and water samples taken quarterly. The results of these analyses are also shown in the following tables

Monitoring point On Site well	YEAR	Nitrate mg/l	Total Ammonia mg/l	Faecal Coliforms MPN/100mls
W1	2005	11.3	0.01	0
W1	2006	8.8	0.01	0
W1	2007	11.9	0.04	0
W1	2008	10.32	0.02	9
W1	2009	10.5	0.05	0

Well AGW1: (Beside house).

Monitoring point On Site well	YEAR	Nitrate mg/l	Total Ammonia mg/l	Faecal Coliforms MPN/100mls
W2	2005	9	0.01	Nil
W2	2006	11.9	0.01	Nil
W2	2007	11.5	0.07	Nil
W2	2008	10	0.01	9
W2	2009	10.8	0.46	0

Well AGW2: (Well beside existing unit).

Stormwater Monitoring point SW1 is monitored quarterly

Parameter		1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr
COD	2004	19	14	35	18
	2005	<1	<1	5	Dry
	2006	<1	<1	<1	<1
	2007		5	Dry	17
	2008	1	Dry	Dry	<1
	2009	<1	5		

5.3.3 Air Quality

Currently emissions to air from the site are not an issue, and would be mostly attributable to the animals that are currently on the site. The odour associated with this site does not and will not cause annoyance and will not interfere with amenity outside the boundary of the site. The nearest dwelling to this site is at a distance of over 480m metres, which is the family home. This development will reduce the current emissions impact by use of modern house designs, ventilation systems, and the specialization of the new breeding unit, and conversion of the existing unit to a fattening facility.

The proposed development will take place in an entirely agricultural hinterland where typical farm odours are to be found and expected. These odours arise from farmyards and lands during the day to day operations such as silage feeding, slurry agitation and land spreading. The existing unit, using best available practices, is already operating without a significant effect on the environment and this situation will be greatly improved as a direct result of this development. The covering of all passageways and open yard area where pigs have access, along with the covering of existing open storage tanks, will reduce the environmental impacts of this facility

5.3.4 Noise Levels

A simple definition of noise is "unwanted sound". The major noises associated with a pig unit are animals at feeding time, ventilation fans, feed unloading and tractors loading pig manure.

Noise levels are measured in decibels and a weighting factor (A) is applied to approximate the frequency response to the human ear. This weighted decibel scale, dB (A) correlates well with human sensations of loudness, disturbance and annoyance.

Noise emissions from this pig farm are not audible, at the site boundary. Noise levels are generally low and typical of a quiet rural area during daytime.

5.3.5 Traffic Levels

Details of current and proposed traffic levels are set out in the Traffic Impact Report included as Attachment 12.

A traffic survey was carried out at the junction of local road leading to the farm and over an eight hour period.

The survey found moderate levels of traffic.

The survey indicates that the development will not have any impact on traffic in the locality.

6 Description of Impacts and Mitigation Methods

6.0 Employment and Human Well-being.

In full production this pig unit will employ 14 full time staff and a manager. These staff will reside locally with a significant positive economic impact on the area. The unit will also indirectly lead to another 48 jobs in pig meat processing, feed compounding and the service sectors.

The pig unit is designed to operate with the best technology under the supervision of a highly trained and experienced manager. The working conditions will meet the standards of the British Control of Substances Hazardous to Health Regulations (COSHH) which implement EC Directive 80/07/EEC.

6.1 Structures

6.1.1 Landscape and Visual Aspects

The proposed unit is located in a rural area. The structures comprise long low A-roofed houses. These pig houses will be approx 80 – 100m long, and approx 30m wide.

The proposed buildings consist of single storey; steel framed structures with PVC coated metal cladding externally to walls and sloping roof. Chimneys will be of grey or green PVC pipe.

Mitigation Measures

- External Finishes

All new buildings and re-cladding to be in selected colour/colours to blend with the surrounding landscape as much as possible. It is proposed to discuss and agree with Cork County Council a scheme prior to commencement.

- **Building Heights**
All new buildings to be designed to keep ridge heights to the lowest possible level. This is achieved by minimising roof slopes and ground floor to eave levels.
- **Landscaping**
It is proposed to provide selected landscaping in the form of specimen trees, shrubs and flowerbeds, particularly at the site entrance. The landscaping proposal is included as appendix 5.

6.1.2 Pig Manure Storage, Surface and Ground Water

All pig manure on site will be stored in purpose built underground concrete tanks, and the engineered storage basin, built to Dept of Agriculture specifications, from where it will be transferred fresh to the proposed anaerobic digester, and to customer farmers in the interim. All pig manure on site will be stored in covered storage tanks, constructed according to Dept. of Agriculture specifications. (Basin FDS S128). A freeboard of 200 mm has been allocated to all tanks under slats to contain gasses. All new storage tanks will be provided with independent leak detection systems, which will have independent inspection chambers. There will be no impact from these on surface or ground waters. The pig manure will be diverted directly from the tanks under the pig houses to the covered storage tanks. All new structures will be provided with leak detection systems which will be visually inspected regularly, and samples analysed quarterly for COD/BOD. These visual inspections will be documented in a register on site which will be available to Cork County Council, Department of Agriculture and EPA officials for inspection at all reasonable times.

A Groundwater Assessment Report was carried out previously for the site in 2003. This is included in Attachment 11. An up-dated assessment has been carried out and is attached in Attachment 11.

6.1.3 Noise Levels

Apart from the noise level at feeding time (10-15 minutes) and from delivery vehicles, the noise levels from the pigs at other times are insignificant.

Other noises arise from the operation of feed preparation plant and ventilating fans. The noise generated by these is inaudible outside the immediate vicinity of the buildings and adjoining yards.

Insulation levels in modern pig unit are high, normally 60 mm extruded polystyrene in walls and 60 mm extruded polystyrene in ceilings. This will greatly muffle noise levels from the interiors of the pig buildings.

6.1.4 Odours and Emissions

Odours and emissions from modern well-managed pig units incorporating best available technologies including anaerobic digestion, covering of areas used for animal movement, fresh removal of pig manure to separate covered storage, and low protein diets. Odours are insignificant outside the confines of buildings and adjoining yards.

6.1.5 Estimated Increase in Traffic

A Traffic Impact Report is included in Attachment 12.

6.1.6 Mortality, Transport and Disposal of Carcasses

Management practices on the unit will be actively focused on minimising pig mortality. Nevertheless, some will occur and the mortality under good management has been estimated and detailed in previous Sections

Carcasses will be temporarily stored in a covered sealed trailer skip for transport to a licensed rendering plant at regular intervals in the manner normal.

6.1.7 Accidental Spillages

Pig manure/digestate is the only material of concern, as feed and oil storage tanks on site are locally banded. Since tankers must be pressurised for delivery of the pig manure, the risk of any sizeable leakage or spillage is minimal. In the case of an accidental spillage occurring, the developer will notify Cork County Council & the EPA and will take the necessary measures to clean up such a spillage. An Emergency Response Procedure has been put in place to deal with such a situation.

6.1.8 Control of Rodents

Staff members successfully carry out the control of rodents on the site. Martin O Donovan insures that this work is carried out professionally and that proper records are maintained.

6.2 Application of Pig Manure

6.2.1 Digestate Application Rates and Nutrient Balance

Digestate/pig manure will be used by customer farmers to supply nutrient requirements to agricultural crops, in accordance with the requirements of the Nitrate Directives (S.I. No. 378 of 2006).

The use of digestate which is planned to replace the current practice of application of raw pig manure to lands to replace chemical fertilisers, will be much more user friendly for the customer farmers, for the following reasons:

- (i) The ratio of phosphorus to nitrogen is better from a crop nutrient requirement point of view, due to the separation of fibrous material with 70 – 80% of P.

- (ii) The digestate will provide more available nutrients for the farmer. The anaerobic digestive process transforms organic bound nutrients to a mineral form, which is readily available for crops, thereby providing a better product for the farmer.
- (iii) The odour emissions from the application of digestate instead of pig manure will be reduced by 80%, due to the gas extraction associated with the anaerobic digestive process, thereby reducing impacts on neighbours.

In relation to chemical loading, the application of the digestate entails the substitution of nutrients from chemical fertilisers by those from organic manure. There is no nett increase in the application of plant nutrients leading to accumulation, particularly of phosphorus and nitrogen. The Statutory Instrument S.I. 378 of 2006 (European Communities Good Agricultural Practice for Protection of Waters), is included in Appendix 9.

6.2.2 Pig Manure/Digestate and the Quality of Surface and Groundwaters.

Pig Manure/Digestate can cause serious water pollution if discharged directly to groundwater or surface waters. Whether or not land application creates a risk to the aquatic environment is largely dependent on a number of natural physical characteristics. These include such factors as geology, soils, climate, hydrology and hydro-geology, and on more anthropogenic factors such as operational procedures and the proximity of other potentially polluting features such as farmyards, silage pits, Slurry pits and septic tanks.

The assessment of the likely impacts from the landspreading needs to consider all of the above factors in a holistic way.

6.2.2.1 Relevant Guidelines

Over the past few years a number of working parties have produced guidelines on the environmental management of intensive agricultural developments.

These include: -

- The Geological Survey of Ireland guidelines for the assessment of the vulnerability of groundwater to various potentially polluting activities and proposed approaches to the risk assessment of groundwater pollution (Daly, 1994)
- The BATNEEC guidance note for the Pig Production Sector, published by the EPA
- Guidance notes prepared as the result of the work of a Technical Sub-Committee under the aegis of the Management committee of the Regional Water Laboratory, which looked at the land-spreading of animal wastes and the scoping of Environmental Impact Statements related to piggery developments (Moore 1995)
- Guidelines for good farm practice detailed in the Rural Environment Protection Scheme documentation (1992 & 1999) also include a section on landspreading.

- Guidance notes and oral communications with EPA representatives relating to the Integrated Pollution Control Licensing Application procedures (1997)

Reference was made to all these sets of guidelines in the preparation of this report. The use of the anaerobic digester will greatly reduce the potential impacts on surface and groundwater.

6.2.2.2 Discussion of Likely Significant Impacts

Groundwater

Vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. The travel time, attenuation capacity of the soils and the nature of the contaminants are important elements in determining the vulnerability of groundwater. The Geological Survey of Ireland has prepared guidelines, which help in categorising the vulnerability. Applying these guidelines and using the properties of the subsoils and bedrock, vulnerability ratings can be determined for the proposed landspread areas.

There has been no historical contamination of groundwater at this site. This proposed development will further reduce the potential impacts at this site, for the following reasons

- (i) The removal of raw pig manure on a regular basis from the existing storage tanks and channels under the houses will reduce the loading pressure on these tanks.
- (ii) A leak detection system will be provided under all new structures and facilities in this proposed development.
- (iii) The application of digestate from the proposed facility, which will replace the current practice of application of raw pig manure, will greatly reduce the risk of nitrate-nitrogen contamination of groundwater, due to the alteration of nitrogen which occurs in the process, rendering it more suitable for plant uptake.

Surface Water

Where subsoils are of low permeability there is an increased risk to surface water, resulting from reduced infiltration to the ground and increased risk of surface run-off. For this reason, it is important that good farm practices are adhered to in relation to surface water protection. Of particular importance are areas sloping towards watercourses that may be prone to surface run-off.

Pig manure will be uniformly spread on dry land and in the growing season February through October. Adherence to the Code of Good Practice for Landspreading (Appendix 13) will forestall surface run-off, which is the most likely route for phosphorus enrichment of surface waters. Moreover, under the proposed spreading schedules, accumulation of phosphorus in the soil will not take place. Applying the pig manure/digestate during the growing season will ensure that nitrate-nitrogen (which is leachable) will be fully taken up by the grass roots and that leaching potential is minimal because of low recharge.

The EPA Discussion document (Anaerobic Digestion: Benefits for Waste Management, Agriculture, Energy, and the Environment Discussion Document 2005), notes that *"in addition to the benefits of energy recovery and displacement of greenhouse gas emissions from fossil fuels, anaerobic digestion produces several beneficial*

outcomes". Of the beneficial outcomes listed the following are considered relevant to water quality:

- (i) Anaerobic Digestion reduces the organic pollution potential of animal slurries. Tests of animal slurries from pilot and farm scale digesters show a reduction of 55% of BOD for cattle slurry, 75% for pig slurry, and 80% for poultry slurries.
- (ii) An appreciable portion of the geology of the country is of a karst limestone composition which makes groundwater particularly vulnerable to pollution. The lower pollution potential of AD processed slurries will provide additional protection to groundwater.
- (iii) AD increases the proportion of nutrients immediately available for uptake by plants, due to the mineralization of nutrients during the digestion process.

6.2.3 Air Quality and Pig Manure/Digestate Use

The proposed customers lands whereupon it is proposed to use pig manure digestate are entirely located in a farming area where the air quality is determined by odours emitted from manure, animals and foodstuffs (e.g. Silage). Nevertheless, every effort is being made to reduce offensive odours to insignificant levels. All manure/digestate will be spread from tankers fitted with a low trajectory splash plate or band spreader to minimise aerosol formation and dispersion. Customer farmers will be advised not to apply pig manure/digestate nearer than 100 meters of any dwelling house save with the express approval of the inhabitants in writing. No spreading of pig manure/digestate will be permitted in windy weather close by dwelling houses or main roads. The development of the anaerobic digester and the application of digestate rather than pig manure will significantly reduce impacts on air quality. This will benefit all stakeholders in the hinterland of the site and associated customer farms.

6.2.4 Management of Co-Product Use

The area available for use of pig manure/digestate is much greater than that required. Pig manure/Digestate will be applied at the rates provided for in the Nitrate Directive Regulations (S.I. no. 378 of 2006). A delivery register will be maintained on site showing the date, amount of pig manure digestate delivered the owner and farm code of the land and the volume of N and P delivered. This register will be available for inspection by Cork County Council, and EPA official's at all reasonable times. A copy of this register is included in Attachment 8.

6.2.5 Mitigation Measures

6.2.5.1 Reduction of Odour Emissions

This issue is addressed in Sections 3.4.3 and 6.2.2.4. In addition the following measures will be taken to reduce odour from the development.

- Fans and chimneys in houses will be so that foul air is dissipated high into the atmosphere where it will be mixed with fresher air thus reducing odours in the locality.
- Strict hygiene and cleanliness will be observed at and around the unit.

- The skip for collecting dead animals will be covered at all times. Carcasses will be removed off site on a regular basis, and delivered to a licensed rendering plant.
- It is intended to further develop the use of low protein diets on site.
- All passageways will be covered.
- The existing open pig manure storage tanks will be replaced by an engineered covered storage basin.
- All pig manure will be treated by the proposed anaerobic digestion facility.

6.2.5.2 Periods and Rates of Use of Pig Manure/Digestate

This issue is regulated by the Nitrate Directive Regulations (S.I. No. 378 of 2006), which provides for application of pig manure digestate in this area between 15 January to 15 October, in accordance with a fertiliser plan. Sharragh Pig Farm is committed to ensuring that the use of pig manure/digestate from this facility, is carried out in accordance with these regulations, and will advise all customer farmers to comply.

6.2.5.3 Reduction of Risk of Disease Spread

The economic viability of a pig production unit at going rates depends primarily on feed conversion ratio and low mortality. High standards of hygiene will ensure that disease is controlled and contained. Access to the unit is strictly restricted, to control the spread of disease to the pig herd. The procedures for dealing with dead animals are standard for the industry.

6.2.3.4 De-commissioning/Life Span of Development

All pig units require a major capital investment every 10-20 years to keep them efficient and pleasant places to work. So long as this investment is made there is no reason that a unit 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. All pig manure and organic matter will be thoroughly removed from the site. All equipment and materials of value will be salvaged. Unused feed, medication, and fuel will be returned to suppliers. It is then proposed that the unit be left standing after making it safe and secure. It is highly unlikely that this scenario would ever develop due to the high initial capital investment in the unit.

6.2.5.5 Depopulation

Depopulation of a unit occurs when a disease such as atrophic rhinitis or haemophilus pneumonia becomes so rampant on a unit that pig production becomes uneconomic. In this event, services cease and pigs are sold so that within 6 months the unit is empty of stock. The unit is left idle for 6 weeks, thoroughly washed and disinfected. After this 6 week period re-population commences.

De-stocking of a unit or complete slaughter of stock on a unit because of a notifiable disease has not happened in Ireland for more than 40 years. In the unlikely event of such a disease outbreak, the Department of Agriculture takes total control. In this event Sharragh Pig Farms have an agreement with to remove all carcasses from the site in sealed containers, and delivery of same to a licensed rendering plant.

6.2.5.6 Reduction of Risk of Pollution to Surface and Groundwaters

The Nitrate Directive sets out steps to be followed to prevent water pollution as follows.

PREVENTION OF WATER POLLUTION FROM FERTILISERS AND CERTAIN ACTIVITIES

Organic fertiliser or soiled water shall not be applied to land within –

- (a) subject to sub-article (5), 200m of the abstraction point of any surface watercourse, borehole, spring or well used for the abstraction of water for human consumption in a water scheme supplying 100m³ or more of water per day or serving 500 or more persons,**
- (b) subject to sub-article (5), 100m of the abstraction point (other than an abstraction point specified at paragraph (a)) of any surface watercourse, borehole, spring or well used for the abstraction of water for human consumption in a water scheme supplying 10m³ or more of water per day or serving 50 or more persons,**
- (c) subject to sub-article (5), 25m of any borehole, spring or well used for the abstraction of water for human consumption other than a borehole, spring or well specified at paragraph (a) or (b),**
- (d) 20m of a lake shoreline,**
- (e) 15m of exposed cavernous or karstified limestone features (such as swallow-holes and collapse features), or**
- (f) subject to sub-articles (8) and (9), 5m of a surface watercourse (other than a lake or a surface watercourse specified at paragraph (a) or (b)).**

It is proposed that on-site storage capacity for pig manure for this development will be well in excess of the 6 months storage capacity generally required for pig manure.

Guidelines on the optimum times for spreading are also available. Under S.I. 378 of 2006 for this area these are 15th January to 15th October, and the advice suggests that the application of nutrients should coincide with the periods of plant growth, so that the nutrients within the pig manure will be utilised by the growing crop. Application of natural fertilisers (i.e.; pig manure) should be avoided when the soil conditions prevent infiltration, such as wet or waterlogged soil, frozen or snow covered soils and on land sloping steeply towards watercourses. Unsuitable climatic conditions include when heavy rain is forecast within 48 hours.

In this proposal for the use of Pig Manure/Digestate

- Spreading will not be undertaken within 10m of any watercourse and the cordon sanitaire is increased in some instances where the slope towards the watercourse was deemed excessive.
- Spreading will not be undertaken within 50m of a domestic supply well.
- Spreading will be done in a safe manner in strict accordance with the best available weather forecasts.
- The proposed spreading rates are considered low and this also help to mitigate any potential impacts.

6.3 General

6.3.1 Flora and Fauna of the Lands Where it is proposed to Use Pig Manure / Digestate, and the Site of the Development

A report in respect of the Impacts of the proposed development on the proposed site was undertaken. The area to be developed consists of a mixture of improved grassland. Hedges on the perimeter are generally well developed. The site is reached via a long access road. The total site area is 4.3 hectares. There is no special or natural flora or fauna associated with this. Structures and paved areas will cover a significant fraction of the site and the proposed landscaping will cover and so influence the flora and fauna in significant fraction of the remainder of the site. The changes will affect such a small area that any impact will be close to zero or neutral with the local area. The site is surrounded by farmland. It is considered that this proposed development will not impact in any way on the flora or fauna in any of the surrounding area. This report is included in full in Attachment No 3

6.3.2 Archaeology and Cultural Heritage

There are no known archaeological sites and no reason to suspect the presence of such sites within or near the site of the proposed development. This issue is addressed in Attachment No 4.

6.3.3 Traffic

The road surface and foundation is sound and is unlikely to deteriorate with the proposed traffic volumes. A Traffic Impact Report is included in Attachment 12.

6.3.4 Climatology

The existing and proposed development has not had and will not have any effect on the climate in the area.

6.3.5 Interactions

When interactions between humans, flora, fauna, soil, water, air, climate and landscape are examined, no significant negative impacts are envisaged.

6.3.6 Material Assets

There is no reason to suggest that material assets will be affected or devalued in the locality due to the proposed development. The proposed development will operate in as sensitive manner as possible and as such no negative impacts on material assets are envisaged.

7 Monitoring

7.1 Drainage from the Site

Uncontaminated roof water from the pig unit is collected via the proposed stormwater collection system as identified on site layout plan included in Appendix 2. There is one monitoring point on the existing unit, and a new one in the proposed unit. A sample is and will be taken from these points quarterly and analysed for COD at an independent laboratory.

All soiled water from the site is diverted to the pig manure storage tanks. A visual inspection of these monitoring points will be made and recorded weekly.

7.2 Groundwater and Surface Water

The two existing wells supplying water to the site are analysed annually and results will be maintained for inspection by Cork County Council, and EPA officials, at all reasonable times. The location of the wells is marked on the site location maps (See Attachment 2). It is proposed to install two new monitoring wells upgradient and downgradient of this new facility.

7.3 Pig Manure/Digestate

A register of all pig manure delivered from the facility will be kept on site. This will record the date, quantity, destination, N and P content of pig manure supplied to customer farmers. This will be available for inspection by Cork County Council, Department of Agriculture and EPA officials at all reasonable times.

7.4 Pig Manure/Digestate Storage.

The pig manure/digestate storage capacity on site will be monitored and recorded monthly, and a record of this register will be kept on site for inspection by Cork County Council Department of Agriculture and EPA officials at any reasonable time.

7.5 Other Wastes

A register of all other wastes (i.e. carcasses, veterinary waste, and refuse) will be maintained and is available on site for inspection by Cork County Council, Department of Agriculture and the EPA at any reasonable time.

8.0 Measures Envisaged in Order to Avoid, Reduce and if Possible, Remedy Significant Adverse Effects.

The measures considered necessary are:

- (i) Provision of sufficient and safe access to the site and measures to avoid excessive soiling of the public road during construction on the site.
- (ii) A secure fence around the site and effective landscaping, comprising hedging, trees, and landscaped earth embankments where necessary, to screen the installation from obtrusive view from the public road and to blend it into the rural landscape.
- (iii) Provision of a storm water drainage system to properly collect and discharge to field drainage all clean rainwater from roofs and clean surfaces via monitoring points as identified in Site Layout Plan, included in Appendix 2.
- (iv) Provision of soiled water drains to properly collect any effluent or soiled water to divert it to the nearest manure tank.
- (v) The collection and the removal from the site of all pig manure digestate to be used by local farmers and fertiliser on their farmlands.
- (vi) The collection and the removal from the site of hazardous waste materials (empty aerosol containers and veterinary waste) generated on the site. Such wastes removed from the site are to be removed only to sites authorised or agreed as appropriate for the disposal or recovery of the waste concerned.
- (vii) The collection and the removal from the site of all dead animals and all animal tissues. Collection is currently undertaken by an authorised waste collector to transport the carcasses for disposal or recovery at an authorised rendering plant.
- (viii) Ensure collection of animal tissue from the site is in appropriate watertight and covered containers, and timely removal so as to ensure minimal generation or release of odours either at the site, or during transit to the disposal/recovery destination.
- (ix) Monitor and maintain records of all monitoring of storm water discharged from the site.
- (x) Record and maintain required records of all consignments of waste despatched from the site.

Implementation of the above will ensure that significant effects on the environment will be avoided and the risk of incidents of environmental significance will be near zero.

Signed:

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