Environmental Impact Statement

Proposed Composting/Biogas Facility
Durnish, Foynes, Co. Limerick

McCarthy
Keville
O'Sullivan

Planning & Environmental Consultants

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Prepared By:	McCarthy Keville O'Sullivan Ltd.

Planning & Environmental Consultants
Block 1, G.F.S.C.
Moneenageisha Road, Galway

McCarthy Keville O'Sullivan

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Non-Technical Summary

1. Introduction

Greenport Environmental Ltd. propose to construct a fully enclosed anaerobic digestion and in-vessel composting facility, capable of receiving up to 50,000 tonnes of organic waste per annum, at Durnish, Foynes, Co. Limerick. McCarthy Keville O'Sullivan Ltd. were appointed as Environmental Consultants on this project and commissioned to complete an Environmental Impact Assessment (EIA) and prepare an Environmental Impact Statement (EIS).

The site of the proposed development occupies 17.24 acres within the Shannon Foynes Port Area, on the southern side of the Shannon Estuary, Co. Limerick. Foynes town centre is located approximately one kilometre southwest of the site, while Limerick City lies approximately 30 kilometres to the east. The site of the proposed development currently comprises a vacant warehouse and external concrete surfaced yard. The proposed facility, which will be fully enclosed, will be constructed within the existing warehouse and in an extension to this building, to be constructed in the yard.

Given the anticipated efficiency of the proposed facility, which will incorporate the use of the Best Available Technology (BAT), it is envisaged that the plant may be capable of processing up to 50,000 tonnes of material per annum. Initially however, the facility will treat 40,000 tonnes of organic waste per annum. This material will comprise source-separated organic waste (household brown bin waste) and mechanically separated organic fines from mixed municipal solid waste. Each of the waste streams will be separately processed at all stages. As the source-separated collection of organic waste increases, the facility will dedicate more capacity to the separate treatment of this material.

The EU Landfill Directive (1999/31/EC), which was introduced in 1999, imposes restrictions on the consignment of certain waste materials to landfill, including a gradual reduction in the quantity of biodegradable municipal waste that may be deposited in landfill sites. Ireland is currently behind schedule on meeting these targets despite receiving a derogation from the EU for the initial targets. Failure to meet the target for 2010 and the subsequent targets will result in significant fines being imposed on the Irish Government. The most recently published Environmental Protection Agency (EPA) National Waste Report identifies as a priority action for 2009 the provision of adequate infrastructure to treat the very large amounts of organic (particularly food) waste that must be collected separately and diverted from landfill.

The purpose of this EIS is to document the current state of the environment in the vicinity of the proposed development site in an effort to quantify the possible effects, if any, of the proposed development on the environment. The assessment process that led to the compilation of this document served to highlight any areas where mitigation measures may be necessary in order to protect the surrounding environment from any negative impacts of the proposed development.

This EIS uses the grouped structure method to describe the existing environment, the potential impacts of the proposed development thereon and the proposed mitigation measures. Background information relating to the proposed development, scoping and consultation undertaken and a description of the proposed development are presented in separate sections. The grouped format sections describe the impacts of the proposed development in terms of human beings, flora and fauna, soils and geology, water, air, noise

and climate, landscape, cultural heritage and material assets such as drainage, site services, traffic and transportation, along with the interaction of the foregoing.

2. Background to the Proposed Development

The site of the proposed development is accessed via the internal roadways of the Shannon Foynes Port Area, which is in turn accessed from two separate junctions with the N69 Limerick to Tralee National Secondary Route. Existing land-uses adjoining the site are industrial and commercial, including dusty coal/clinker storage (outdoors), engineering companies and other warehousing. Aughinish Alumina Refinery is located approximately 2.4 kilometres northeast of the proposed development site, on Aughinish Island. With regards to the wider landscape, agriculture is the dominant land-use within the Shannon estuary lowlands of Limerick and Clare.

The lands to the east of the proposed development site are generally flat, while more hilly topography is found to the west and the south. The River Shannon flows from east to west directly north of the site. The site of the proposed development lies in proximity to the Lower River Shannon Special Area of Conservation (SAC) and Natural Heritage Area (NHA) and the River Shannon and River Fergus Estuaries Special Protection Area (SPA).

A planning application was submitted by Greenport Environmental Ltd. to Limerick Co. Council in August 2008 for permission for change of use of the existing warehouse on the site of the proposed development to an in-vessel composting facility and the removal of an existing open-ended lean-to (Planning Reference No. 08/1633). Planning permission was granted for the change of use in March 2009.

This chapter of the EIS sets out the strategic and statutory planning context for the proposed composting facility at Foynes. It examines the regional and local planning policy context established by the Mid-Western Regional Planning Guidelines 2004, the Limerick/Clare/Kerry Regional Waste Management Plan, and the Limerick County Development Plan 2005 – 2011. It also presents the national policies and targets established by the Department of the Environment, Heritage and Local Government with regards to biological treatment of municipal solid waste (MSW) and the diversion of biodegradable municipal waste (BMW) from landfill.

Scoping is the process of determining the content, depth and extent of topics to be covered in the information to be submitted to the competent authority for projects that are subject to an EIA. In carrying out this EIA, a scoping document was issued by McCarthy Keville O'Sullivan Ltd. to the relevant authorities and non-Governmental Organisations (NGOs) with interest in the specific aspects of the environment likely to be affected by the proposal. Responses were received from the Department of the Environment, Heritage and Local Government, An Taisce, Limerick Co. Council and the National Roads Authority. The recommendations made by consultees have informed the EIA process and the contents of the EIS.

3. Description of Proposed Operations

Greenport Environmental Ltd. proposes to construct a fully enclosed in-vessel composting and biogas facility, capable of treating up to 50,000 tonnes of organic waste per annum. The incoming waste streams to be treated at the facility will comprise:

- Approximately 20,000 tonnes per annum of mechanically separated organic feedstock.
- Approximately 20,000 tonnes per annum of source-separated organic feedstock.

These quantities are estimates based on the successful rollout of source-separated brown bin collections to domestic and commercial customers in urban areas, in line with the *'National Strategy on Biodegradable Waste'*. Each of the waste streams will be separately processed at all stages. As source-separated collection of organic feedstock increases, the quantity of mechanically separated feedstock is expected to decline. The facility will then dedicate more capacity to the separate treatment of the source-separated material.

The biological treatment of organic waste encompasses two types of microbiological processes: composting and biogasing or anaerobic digestion. The main end-products of composting consist of a stabilised, odourless organic material (compost), carbon dioxide and water. During the process, the energy stored in biomass is converted to heat. This heat production causes the evaporation of the water that is present in the biomass and produced during the composting process. During anaerobic digestion the energy that is stored in the biomass is converted to methane. Methane can be harnessed for generation of energy that can be used elsewhere for electricity/heat generation.

The existing warehouse occupies 4,554.5 square metres (including two floors of office space). The proposed extension will measure 6,079.65 square metres. The proposed storage areas will measure 2,640.60 square metres. The overall site area occupies 3.424 hectares or 34,240 square metres.

Incoming material will be delivered to the reception area within the facility. It will be thoroughly homogenised, and then transferred immediately into one of the processing tunnels. There will be no storage of incoming material onsite prior to its processing.

The feedstock will first be treated in a Dry Anaerobic Digestion tunnel system in order to produce electric energy. The material will be removed from the first stage vessel, mixed with a fraction of incoming fresh material and processed through the aerobic vessel composting and drying system. Retention time will be in the range of two to three weeks. The composted product will be treated into a refining system where three fractions shall be separated.

As it is proposed that the facility will be handling two different grades of material (organic fines and source-segregated household and commercial organic material), two grades of end-product material will be produced: Class 1 compost produced from the source-separated material to be marketed as garden compost, and Class 3 compost (stabilised biowaste) to be used as landfill cover or as land remediation material.

The composting process will continue 24 hours per day, 365 days per year, but material will only be accepted at the facility during the hours of 7:30am – 6:00pm, six days a week. The majority of incoming waste will be sourced from the Mr. Binman Ltd. waste transfer station and recycling centre in Luddenmore, Grange, County Limerick.

Negative pressure will be created within the facility to ensure odorous and polluted air is treated in this system without escaping uncontrolled from the plant. All air within the building will also flow through the humidifier and biofilter abatement system prior to discharge. The air extraction system is designed with sufficient air changes to protect employees.

A site-specific Health and Safety Plan for the proposed composting facility is currently being prepared. All site staff will be made aware of and adhere to the company Health and Safety Plan. A Pest Control Plan for the site of the proposed development has been prepared by Curtin Pest Control.

The existing water supply to the site is via the Foynes Harbour Water Supply Scheme. The fire water supply is taken from the Foynes Harbour Fire Supply. The potable water supply is taken from the Limerick County Council Foynes water supply scheme, which is supplied from the Shannon Estuary Water Supply scheme whose source is the River Deel at Askeaton.

With regards to surface water run-off, external surface areas within the site will be limited to the perimeter of the building to allow access and egress for vehicles, thereby limiting the volume of run-off. Surface water run-off from external surfaced areas will discharge via a Class 1 hydrocarbon interceptor to the watercourse on the eastern boundary of the site. The Shannon Estuary will be the final receiving water for external surface water run-off from the site.

All process operations associated with the proposed composting and biogas facility will take place indoors on an impermeable surface. All process wastewater generated will be contained in bunded storage tanks and re-used within the process. There will therefore be no process discharges off-site to ground or surface water.

Toilets are available onsite within the existing warehouse building, from which wastewater currently discharges to an onsite septic tank. A suitably sized 'Puraflow' or equivalent mechanical treatment unit will be installed onsite to replace this septic tank. The treated effluent will discharge to an existing sewer provided as part of the contract for an adjacent facility.

The proposed development site is supplied by the ESB network. The design, construction and installation of the electrical system equipment within the proposed facility will be in accordance with International Electro-technical Commission (IEC) regulations and shall comply to all applicable Community and national regulations. A lighting plan for the proposed development site has been prepared, and shows that there will be no light spill outside the proposed development site.

Planning permission has been obtained by Greenport Environmental Ltd. from Limerick County Council for the change of use of the existing onsite warehouse from a timber frame construction facility to an in-vessel 10,000 tonne per annum composting facility and the removal of an open-ended lean-to (Planning Reference No. 08/1633). The demolition of the lean-to will take place prior to the construction of the proposed composting facility. All materials will be retained on site for future internal building works and repairs. It has been confirmed that this structure was not constructed using asbestos containing materials. The proposed composting and biogas facility will be constructed in one phase. It is anticipated that the duration of the construction phase will be approximately six months.

4. Human Beings

This section of the Environmental Impact Statement (EIS) discusses the key issues affecting human beings and the potential impacts of the proposed development on them. The key issues assessed in this section of the EIS include population, community and employment, health and safety, land-use, and tourism. Information regarding human beings and general socio-economic data were sourced from the Central Statistics Office, the Limerick County Development Plan 2005-2011 and the Limerick City Development Plan 2004-2010.

In order to make inferences about the population and other statistics in the vicinity of the proposed mixed development, the study area was defined in terms of the Electoral

Divisions (EDs). The development lies within the Shanagolden Electoral Division area and is surrounded by four other EDs: Aughinish, Craggs, Loghill and Shanid. These five EDs make up the Study Area for this section of the EIS. The dominant land use in the area is pastoral agriculture, with 82.8% of land within the Study Area being farmed, according to the 2000 Census of Agriculture.

The northwestern half of the Aughinish ED and the northeastern section of the Shanagolden ED are dominated by areas of industrial influence. While these particular areas of the EDs are under development pressure, the remainder of the study area is rural in nature, with agriculture being the predominant land-use. The vast majority of the study area is outside of settlement centres and is not subject to development pressure as would be expected on the urban fringe of Limerick City, although there has been a significant increase in the number of one-off houses being built in rural parts of the county in recent years.

Although land-use in the study area is primarily agricultural, the land-use in the immediate vicinity of the proposed development to the north, south and west is made up of heavy industry and indeed the site of the proposed development is an industrious site that is not currently in use. The area of land to the east of the site is owned by Irish Cement, but has not been developed for industrial purposes to date. The highly industrious area of Aughinish Alumina is located further to the east.

New developments help to sustain employment in the construction trade. The construction works for the construction of the extension and the refit of the existing warehouse will be put to tender, which will allow local firms to bid for the works. Concrete will be sourced locally, subject to price agreement. The proposed development will therefore have a direct positive impact on the local employment.

A site-specific Health and Safety Plan for the proposed composting facility is currently being prepared. All site staff will be made aware of and adhere to the company Health and Safety Plan. The proposed facility will incorporate the use of Best Available Technology and has been designed to ensure that there will be no negative impacts on human beings resulting from emissions to air, ground or water. These detailed design measures are described in Chapters 3 (Description of the Proposed Development), 7 (Hydrology and Hydrogeology) and 8 (Air Quality, Climate and Noise) of the EIS.

5. Flora and Fauna

This section of the EIS was compiled following a site visit carried out during November 2008 and a desk study of literature pertinent to the site. During fieldwork, flora and fauna were surveyed through direct observation and the recording of signs or calls of birds and mammal species. Habitat suitability was also assessed for the likely occurrence of other species, which would not be present due to seasonal factors. The literature review included the synopses of sites designated for their conservation importance, as compiled by the National Parks and Wildlife Service (NPWS), bird and plant distribution atlases and other research publications

The site of the proposed development is situated just over 100 metres south of the Lower River Shannon Special Area of Conservation (SAC), the River Shannon & River Fergus Estuaries SPA (Special Protection Area) and the Inner Shannon Estuary – South Shore proposed Natural Heritage Area (pNHA.)

The habitats recorded on or adjacent to the site of the proposed development include treelines, buildings and artificial surfaces, recolonising bare ground and flower beds and

borders. None of the habitats are in their natural state, having been altered or created by industrial activity. The site has not been managed in some time and coloniser plants have become established on areas that were formerly hard-standing. The treelines on site add little habitat diversity, since they are composed of non-native species or are in poor condition. Overall the character of the site is one of abandoned industry.

None of the species that were recorded on the site visit are considered to be of conservation importance. The bird species recorded onsite were typical of the habitat types found on the site, built up areas, treelines and adjacent agricultural land. The only Mammal that was directly observed within the site during the visit was Irish Hare (*Lepus timidus hibernicus*). A group of four Leverets were observed on several occasions on the site. In addition an abundance of Hare droppings was recorded. Badger (*Meles meles*) faeces and scuffle marks were recorded in several locations in the eastern section of the site. There was, however, no evidence of Badger habitation, and indeed the ground conditions were very unsuitable for burrowing on the site. A single fox (*Vulpes vulpes*) dropping was recorded on the track between the two arable fields.

Given the nature of the site and its habitats, the associated fauna would be expected to be of low ecological significance. Although evidence of Badger and Irish Hare was recorded on site, the site itself is not expected to support these species during the breeding season and these mammals are thought to be occasional visitors to the site.

Areas of habitat within the footprint of the proposed development include buildings & artificial surfaces and recolonising bare ground. The proposed development will result in the permanent loss of these habitats within the construction footprint. These habitats are of low ecological significance and the resultant impact is considered to be slight.

The use of vehicles on the construction site gives the potential for the spillage of fuel and oil on the site either from leaks from vehicles or fuel tanks or spillages. These substances may leach down into the soil, subsoil and groundwater and eventually contaminate surface waters. In order to prevent such negative impacts, all machinery used during the construction works will be checked and maintained to avoid leaks of fuel, lubricants etc. Best practice for machinery management on construction sites will be adopted.

A concrete hard standing surrounds the entire building and the extension will be laid on existing hard standing area. Class 1 oil interceptors will be installed on the storm water lines servicing these hard standing areas in the initial stage of the project to ensure the construction phase does not impact on ground or surface water quality. All refueling activities will take place in a designated refueling area. All fuel on the site will be stored in double skinned (bunded) tanks in the designated fuel areas.

The proposed development will increase traffic and activity in the area, thus increasing disturbance of wildlife including birds (e.g. Curlew) and mammals (E.g. Irish Hare and Badger) using the site and adjacent areas. However as the site of the proposed development is within an industrial zone that is already subject to moderate volumes of traffic, this impact is considered to be slight to moderate.

No lighting will spill onto the estuary as the development is over 100 metres inland. In addition the tree-line on the north side of the site and a building north of the site provides good screening which will prevent light from the facility from spilling on to the estuary. Thus there will be no visual impact on the estuary.

There will be no discharges of environmental significance from the facility. All process wastewater generated will be contained in wastewater tanks and reused in the process. therefore

6. Geology and Soils

This section of the Environmental Impact Statement (EIS) relates to geology and soils at the site of the proposed development. Detailed descriptions of the existing soils and geology are provided along with information on potential significant environmental impacts due to the proposed development.

The sub-surface conditions at the site were identified through the study of existing maps and reports, aerial photography and detailed site investigation. Aerial photographs show the site is a Brownfield site adjacent to the River Shannon. Historically the site was used for coal storage. The topography of the site is lowland/estuarine floodplain. The site is 90 metres south of the river Shannon and 180 metres west of Robertstown River. Approximate ground level is 13 metres AOD.

The Geological Survey of Ireland (GSI) Sheet 17 published in 1999 indicates that the site may be underlain by the Carboniferous Durnish Formation (limestone). The GSI web mapping service indicates that the formation may be a locally important aquifer that is moderately productive. An interim assessment of the vulnerability for the formation had been carried out. There were no mapped karst features within the formation.

A geophysical survey of the site was carried out in March 2009 by Apex Geoservices. Their results show that rockhead varies from 0.3 metres to 7 metres below ground level (bgl). The rockhead is shallow in the central and western part of the site and getting deeper in the east. In the vicinity of the proposed development site rockhead is estimated to be 0.3 metres to 3.6 metres below ground level. The survey indicates that rock may comprise moderately weathered and fractured limestone with shale. No significant karstification was found in the limestone although two anomalous areas were identified in the Resistivity surveying – these require further investigation but are expected to be associated with saline intrustion based on experience from adjacent sites.

The made ground onsite was likely placed as part of the original site build up or reclamation on top of the soft alluvial soils then topped with hard standing or concrete. The hard standing comprises both concrete and hardcore. The levels on site were changed prior to 1991. Site build up comprises compacted fill. It is not laterally persistent over the site but where present varies in thickness from 0.2 metres to 2.45 metres.

Detailed site investigations were also carried out by Mouchel Ltd. The assessment concluded that the site is suitable for its current use and proposed use assuming that the proposed development is as stated and will comprise mainly buildings and hard standing. The site comprises mainly hard standing, thereby reducing the potential linkage between source and receptor. However, should the site be redeveloped to include areas of soft landscaping or for a more sensitive end use it is recommended that further assessment is carried out.

No significant impacts on the receiving soils or geology are anticipated. No elevated concentrations of ground gas were recorded during the monitoring. Where possible excavated soils will be reused on site to reduce spoil to land fill. The potential to contaminate groundwater will be prevented by channelling run-off to drainage ditches for discharge to surface waters after attenuation to remove hydrocarbons, leachate and particulate contaminants. Drainage will be sealed to prevent interaction with the

underlying aquifer. Dewatering will be limited and re-injected where possible. Site levels are to remain similar to the existing profile to limit potential settlement and disposal of unsuitable soils. Potential impacts on site soils and geology will be monitored and reassessed at regular intervals throughout the construction phase by means of site walkover and risk assessments. Also there will be continued monitoring of ground gas and leachate concentration in groundwater.

7. Hydrology & Hydrogeology

This section of the Environmental Impact Statement describes the watercourses and aquifers at the site of the proposed development. The impact of the development on the watercourses and aquifers is discussed and evaluated. Mitigation measures are proposed, and the residual effects are described.

The site is bounded to the north by a shallow open drain and to the east of the site there is an open drain which is routed through low-lying lands to a back drain which discharges to the Robertstown River and ultimately to the Shannon. The surface water from the site currently discharges via the open drain to the north and via a piped outfall through third party lands to the open drain to the east of the site.

The area immediatly east of the site is defined by the Office of Public Works (OPW) as "Benefiting Lands" i.e. lands identified by the OPW as those that might benefit from the implementation of Arterial (Major) Drainage Schemes (under the Arterial Drainage Act 1945) and indicating areas of land subject to flooding or poor drainage. There is protection to the lower lying land to the east of the site by embankments to the Robertstown Creek and Shannon Esturary.

In accordance with the requirements of the Planning System and Flood Risk Management Guidelines (Draft) of September 2008, zones are to be defined for development sites. The zoning is established based on flood probabilities. The extreme flood events are not fully defined for the Foynes area. As the site is located at 3.68 metres above the 1 in 40 year flood event, it is reasonable to conclude that the area proposed for development is significantly above the 1 in 1000 year flood event and accordingly within Flood Zone C (probability of flooding is low at less than 1 in 1000 year probability).

The Site Investigation undertaken by Priority Geotechnical in June 2008 and supervised by Mouchel identified groundwater levels at between one and three metres depth below existing ground level. The site investigation indicates that there were no exceedances in relation to Environmental Quality Standards for a marine, estuarine and coastal situation. The recommendation by Mouchel is that there is a low risk posed to the site by the contaminants currently present.

The existing water supply to the site is via the Foynes Harbour Water Supply Scheme. The fire water supply is taken from the Foynes Harbour Fire Supply. The potable water supply is taken from the Limerick County Council Foynes water supply scheme, which is supplied from the Shannon Estuary Water Supply scheme whose source is the River Deel at Askeaton. From a review of Limerick County Council supply sources and GSI data, there are no well sources identified in the vicinity of the subject site. The firewater supply is provided by a 2,000,000-gallon storage reservoir located in Leahys, Foynes. The proposed development will be connected to the Foynes Harbour Fire Water Main Supply, It is understood that plans are at an advanced stage for the upgrade of the fire water supply, which is scheduled for upgrade.

There are no proposed discharges to groundwater from the proposed development. All external areas on the site are to have impermeable surface with a surface water collection system. The external surface water drainage system will be routed through a Class 1 oil interceptor prior to discharge to an attenuation tank with controlled discharge to the adjacent drainage channel. Roof water will be partly directed to a storage tank for use in the composting process.

All process operations will take place indoors on an impermeable surface and all process wastewater generated will be held in bunded storage for re-use in the process. There will be no process discharges off-site or to ground or surface water. It is proposed that the surface water run-off will be restricted to current development discharge rates.

External surface areas will be limited to the perimeter of the building to allow access and egress for the vehicles, thereby limiting the volume of surface water run-off. The external surface water run-off will be discharged via a silt trap/oil interceptor, which will be installed at the start of the project to prevent any impacts during the construction or the operational phase. During the construction phase all vehicles will be inspected for leaks prior to entering the site.

A 'Puraflow' mechanical treatment unit or equivalent will be installed onsite to treat effluent from the office area facilities. This treatment unit will replace the use of the septic tank currently onsite. The treated office area foul effluent from the mechanical wastewater treatment unit will discharge to the Shannon via existing outfall provided as part of the contract for the adjacent facility. Emission limits will be assigned under the EPA licence for the facility for the discharge of this effluent.

Highest standards of site management will be maintained and utmost care and vigilance followed to prevent accidental contamination or unnecessary disturbance to the site and surrounding environment during the construction phase. A named person will be given the task of overseeing the pollution prevention measures agreed for the site to ensure that they are operating safely and effectively.

The design and construction of the process waste water and waste water pipe networks and storage chambers will be such that the systems will be leak-proof.

8. Air and Climate

Byrne Environmental Consulting Ltd. was commissioned to prepare an Air Quality, Climate and Noise Impact Assessment on behalf of Greenport Environmental Ltd. for the proposed development. This impact assessment identifies and presents the potential air quality, climatic and noise impacts associated with the proposed development. It also presents the proposed mitigation measures that shall be implemented at the development site to ensure that all site activities are controlled and managed according to Industry Best Practices to minimise the impact on the local receiving environment. Baseline dust and noise monitoring was carried out as part of the assessment, and the results are presented in this chapter of the EIS.

The proposed facility has been designed to include state of the art air quality abatement technologies including an air scrubbing system, humidifier and biofilter system, and enclosure of all processes within the plant building. In order to ensure that the potential for odour nuisance is minimised, the facility has been designed to operate under negative pressure whereby all air within the facility building and processing areas shall be vented through the scrubber, humidifier and biofilter system. A negative pressure building is kept

at a lower air pressure than the outside atmosphere. This ensures that air does not escape the building, except through the scrubbers, humidifiers and biofilter systems.

Guidelines from the UK Environment Agency and Cré - The Composting Association of Ireland specify that the minimum distance that composting facilities should be situated relative to receptors to ensure the potential impacts of bioaerosols such as *Aspergillus fumigatus* are minimised is 250 metres. This minimum distance is significantly exceeded at the proposed facility, with the closest receptors located approximately 450 metres upwind of the facility.

Noise generated by the operation of the facility will be attenuated as all processing activities will occur within the plant building, and any external plant including fans and duct shall be enclosed and include silencer systems.

A programme of routine air quality monitoring including bioaerosol sampling for *Aspergillus fumigatus* using the Anderson Sampling Technique, dust monitoring using *German Standard Method for determination of dust deposition rate (VDI 2129),* odour monitoring utilising olfactometric analysis and environmental noise monitoring at baseline monitoring locations has been designed to verify that the proposed air quality and noise mitigation measures are effective in ensuring that the potential impacts on the receiving environment and local residential receptors in the Foynes area are minimised.

9. Landscape

This section of the EIS addresses the landscape and visual impacts of the proposed development. It includes a description of Limerick County Council landscape policy, with specific reference to the area within which the proposed development site is located. Landscape values and sensitivity are also examined. The landscape of the area is described in terms of its character, which includes a description of the physical, visual and image units.

The Landscape Character Assessment of County Limerick divides the county into ten distinct Landscape Character Areas (LCAs). The proposed development site is located within Landscape Character Area 2, referred to as the Shannon Integrated Coastal Management Zone (ICMZ), which comprises a large area of northern County Limerick. The Shannon Estuary is the defining characteristic of this region. The landscape itself is generally that of an enclosed farm type, essentially that of a hedgerow-dominant landscape.

In general, the lands to the east of the site are relatively flat, while more hilly topography is found to the west and the south. The site itself is flat. Land-cover to the south of Foynes is primarily agricultural, although areas of broad-leaf and coniferous forest are also a common element. Pockets of peat bog are found further southwest, particularly around the Ballyhahill area. Land-use in the vicinity of the proposed development site is industrial and commercial. The site of the proposed development currently comprises a vacant warehouse and external surfaced yard.

Aughinish Alumina Refinery, which is located on Aughinish Island to the northeast of Foynes, is one of the largest refineries in Europe. The waste ore or bauxite residue produced by the refinery is a reddish-brown colour and is spread on the western part of Aughinish Island, on an area of approximately 200 acres. The low hill on Aughinish Island, on which the reddish-brown waste ore from the refinery is spread, forms the most distinctive feature in the local landscape.

The availability of views to the west of the proposed development site is limited by the industrial buildings of the Shannon Foynes Port Area. To the south and southwest, the range of visibility extends to the hilly topography of Ballynacragga, and to the east to Aughinish Island. Looking towards the southeast, the hilly topography of the Barrigone and Craggs area is visible. The Shannon Estuary is not visible from within the site.

There is one National and two Regional Routes located within a five-kilometre radius of the proposed development site. However, the proposed development site is located in the northeastern corner of the Shannon Foynes Port Area and as such is visible only from the internal roadways of the Port Area. These roadways are used by port employees and commercial traffic operating within the Port Area and are not open to members of the general public.

There are no houses located in the immediate vicinity of the proposed development site. Many houses within Foynes town face towards the port, and thus the occupants have a view or partial view of the industrialised Port Area. The proposed development site is screened from the view of the occupants of these houses by the industrial and commercial buildings that lie in the intervening lands between these houses and the site. There are no views of the proposed development site available from any hotels or other amenities in the Foynes area such as golf courses, walking routes, parks, nature areas or sports fields.

The construction phase of the proposed development will encompass the movement of construction vehicles into and out of the site, and the storage of machinery, other equipment, temporary site buildings and building materials onsite. These activities will have no visual impact on the surrounding area. The Shannon Foynes Port Area is a busy industrial premises and construction works are currently taking place on a site located directly west of the proposed development site. The activities associated with the construction phase of the proposed development will therefore assimilate well into their receiving environment.

The proposed composting facility will be constructed within the existing warehouse and in part of the external yard. The change in land-cover will have no impact on the industrial character of the surrounding landscape. The site is screened to the north, south and west by warehouses and other industrial buildings. Visibility of the site within the surrounding landscape will not increase as a result of the proposed development. The proposed development will have no impact on the designated Scenic Views of the Shannon Estuary, which are available from the N69 National Secondary Route between Foynes and Glin. The site is not currently visible from any part of this road, and this will not change with the construction of the proposed composting facility.

10. Cultural Heritage

Cultural Heritage (Physical) in respect of a project is assumed to include all humanly created features on the landscape, including portable artefacts, which might reflect the prehistoric, historic, architectural, engineering and/or social history of the area. The Cultural Heritage of the subject development area and environs was examined through an Archaeological, Architectural and Historical study. The Archaeological and Architectural studies involved a documentary/cartographic search and field inspection of the area, while the Historical study involved documentary research. Such research and inspections were undertaken in the manner recommended by the Heritage and Planning Division of the Department of the Environment, Heritage and Local Government, who were consulted as part of the wider scoping exercise undertaken by McCarthy Keville O'Sullivan Ltd.

The subject development site is located in the townland of Durnish, in the civil parish of Robertstown and in the barony of Shanid. Historic Ordnance Survey maps of the site and immediate environs indicate the presence of a probable residential farm – Durnish Cottage – located in the general area of the subject development site. This complex of buildings, together with associated agricultural field systems, is at least of early nineteenth century date and was removed when the port lands were extended eastwards. In addition, there is evidence from the maps that the bay to the immediate east of Durnish Point, to the north of the subject development area, were subjected to reclamation works in the late nineteenth century. Additional reclamation works were undertaken to the estuary edge to the west of the subject lands in more recent times.

Research undertaken as part of the project indicates that there are no historical events associated with the subject development lands. In addition, there are no previously Recorded Monuments located within, or in the immediate environs of, the subject development lands – the nearest monument is an Enclosure (SMR: LI010:009), situated approximately 450 metres to the south. Likewise, the site inspection/surface reconnaissance survey did not reveal any surface traces of archaeological potential within, or in the immediate environs of, the subject development lands and it is suggested that the raising of the levels across the site has probably resulted in extensive ground disturbance/reductions to the original site surface.

There are no Protected Structures, within the meaning of the Planning and Development Act 2000, situated either within the boundaries of the subject development lands or within the defined study area of approximately 500 metres surrounding such lands. There is a modern office/warehouse structure contained within the subject site boundaries and a number of modern warehouses located to the south, north and west of the subject site. Field inspections of the site and environs indicate that none of these structures are of architectural heritage potential/interest.

The development, as proposed, will cause any direct or indirect/visual impacts on any features or structures of historical, archaeological or architectural heritage interest. Consequently, it is not envisaged that any mitigation measures are required.

11. Material Assets

This section of the EIS considers economic assets of human origin, including major utilities such as transportation infrastructure, water supply, sewage and power systems. Economic assets of natural heritage include non-renewable resources such as minerals or soils, and renewable resources such as wind and water. These assets are dealt with in other sections of the EIS such as Chapter 6 Soils & Geology, Chapter 7 Hydrology and Hydrogeology, and Chapter 8 Air, Climate and Noise. Cultural assets are discussed in Chapter 10.

Traffic and Transportation

The traffic and transportation assessment for the proposed development has been carried out in accordance with the National Road Authority (NRA)'s *'Traffic and Transportation Assessment Guidelines'* (2007) and makes reference to the *'Guidelines for Traffic Impact Assessment'* published by the Institution of Highways and Transportation (1994). The purpose of this assessment is to assess the potential impact of the proposed development on the existing junction with the National Road network, and to ensure that the site access will have adequate capacity to carry the development traffic and the future growth in existing road traffic to the design year and beyond.

Manual classified traffic turning count surveys were carried out by Michael Punch & Partners during November 2008 at the junction between the N69 and the Foynes Port Area. The AM peak hour was 9.00am to 10.00am and the PM peak 4.30pm to 5.30pm. The traffic count was converted to Passenger Car Units (PCUs) for use in the modelling software. The Foynes Port access junction has been modelled using the TRL junction analysis software package PICADY version 5.

Over a five-day week, there will be nine loads of material delivered to the facility a day. These trailers will leave the facility empty. There will be three articulated vehicles drawing this material, each doing three loads. In addition to this there will be approximately five to six loads of material going out of the facility on a daily basis. These will be removed by a further two articulated vehicles. This is a maximum of 15 trucks in/out per day. In order to model an onerous condition the analysis assumes that all of the trucks enter and leave the site during the AM peak hour and also during the PM peak hour in order to robustly test the two peak periods.

As a worst-case scenario it is also assumed that the additional traffic generated at the junction with the National Road due to the facility will turn right off the National Road (in fact most of it will) and turn right onto the National Road (in fact little of it will). If under these worst case assumptions the access is found to have sufficient capacity in the PICADY model it can safely be assumed that the access will have sufficient operating capacity at all times of the day.

The PICADY analysis shows that the Foynes Port access junction would be well within practical reserve capacity by the design year 2025 even under the onerous assumptions made throughout the analysis in relation to existing traffic flows and future traffic generation. The volumes of traffic that will be generated during the construction phase of the development will be small in comparison to the traffic volumes *modelled* for the operation of the development during the peak periods. A quantitative analysis for the construction stage would yield lower ratio of flow to capacity results than the worst-case scenario analysed in the report, which is the 2025 peak hour. The construction stage therefore did not require traffic analysis.

The additional traffic generated by the proposed composting/biogas facility can easily be accommodated at the existing junction with the National Road when combined with the predicted increased background flows on the National Road to the year 2025 and beyond.

Services

The existing water supply to the site is via the Foynes Harbour Water Supply Scheme. The fire water supply is taken from the Foynes Harbour Fire Supply. The potable water supply is taken from the Limerick County Council Foynes water supply scheme, which is supplied from the Shannon Estuary Water Supply scheme whose source is the River Deel at Askeaton. Significant quantities of additional water will not be required during the operational phase of the proposed development, as a roof water storage tank will be installed, which will provide supplementary process water, when required.

A drainage model was prepared to establish the surface water drainage volumes generated from the proposed development. In addition, an assessment of the existing run-off from the facility was calculated. It is proposed to limit the surface water run-off from the facility to the current discharge rate of 209 litres per second. Surface water run-off from external surfaced areas within the site will discharge via a Class 1 hydrocarbon interceptor to the watercourse on the eastern boundary of the site.

All process operations associated with the proposed composting and biogas facility will take place indoors on an impermeable surface. All process wastewater generated will be contained in bunded storage tanks and re-used within the process. There will therefore be no process discharges off-site to ground or surface water.

Toilets are available onsite within the existing warehouse building, from which wastewater currently discharges to an onsite septic tank. A 'Puraflow' mechanical treatment unit or equivalent will be installed onsite to replace this septic tank. This upgrade will be completed at the beginning of the construction works to ensure there is no impact on emissions to the sewer during the construction phase. Following discussions between Greenport Environmental Ltd. and the Shannon Foynes Port Authority, the connection from the onsite treatment unit will be made to a sewer that is currently under construction on the Port Road.

The proposed development site is supplied by the ESB network. The design, construction and installation of the electrical system equipment within the proposed facility will be in accordance with International Electro-technical Commission (IEC) regulations and shall comply with all applicable Community and national regulations.

A lighting plan for the proposed development site has been prepared. 19 No. AKTRA 600w High Pressure Sodium (HPS) floodlights will light the interior of the site. The lux levels shown on the lighting plan show that there will be no light spill outside the proposed development site.

12. Interaction of the Foregoing

All of the reasonably predictable significant impacts of the proposed development and the measures proposed to mitigate them have been outlined in this report. However, for any development with the potential for significant environmental impact there is also the potential for interaction amongst these impacts. The result of these interactions may either exacerbate the magnitude of the impact or ameliorate it. The interaction of impacts on the surrounding environment needs to be addressed as part of the Environmental Impact Assessment process.

While the work for all parts of the EIA were not carried out by McCarthy Keville O'Sullivan Associates Ltd., this Environmental Impact Statement was edited and collated by McCarthy Keville O'Sullivan Ltd. as an integrated document, rather than a collection of separate reports. The impacts that arise as a result of the interaction between several aspects of the development have therefore been addressed in Sections 4 to 11 of this report.

1 INTRODUCTION

1.1 Introduction

This Environmental Impact Statement (EIS) has been prepared by McCarthy Keville O'Sullivan Ltd. on behalf of Greenport Environmental Ltd. Greenport Environmental Ltd. propose to construct a fully enclosed anaerobic digestion and in-vessel composting facility, capable of receiving up to 50,000 tonnes of organic waste per annum, at Durnish, Foynes, Co. Limerick. McCarthy Keville O'Sullivan Ltd. were appointed as Environmental Consultants on this project and commissioned to complete an Environmental Impact Assessment (EIA), which fulfils the requirements set out by the Environmental Protection Agency (EPA) in the *'Guidelines on the Information to be contained in Environmental Impact Statements'* and Schedule 6 of the Planning and Development Regulations 2001, relating to the information to be contained in an EIS.

1.2 The Applicant

Greenport Environmental Ltd. is a Limerick-based company, which was established in 2008 with the primary aim of developing a large-scale composting and biogas facility in the Mid-West Region. The parent company of Greenport Environmental Ltd. is Mr. Binman Ltd.

A Dutch company, Waste Treatment Technologies, which has extensive experience in the design and commissioning of composting facilities worldwide, has been engaged by the applicant to design the proposed project.

1.3 Brief Description of the Proposed Development

Greenport Environmental Ltd. proposes to construct a fully enclosed anaerobic digestion and in-vessel composting facility at Durnish, Foynes, Co. Limerick. The site of the proposed development occupies 17.24 acres within the Shannon Foynes Port Area, on the southern side of the Shannon Estuary, Co. Limerick. Foynes town centre is located approximately one kilometre southwest of the site, while Limerick City lies approximately 30 kilometres to the east. The site of the proposed development currently comprises a vacant warehouse and external concrete surfaced yard. The proposed facility, which will be fully enclosed, will be constructed within the existing warehouse and in an extension to this building, to be constructed in the yard.

Given the anticipated efficiency of the proposed facility, which will incorporate the use of the Best Available Technology (BAT), it is envisaged that the plant may be capable of processing up to 50,000 tonnes of material per annum. Initially however, the facility will treat 40,000 tonnes of organic waste per annum. This material will comprise source-separated organic waste (household brown bin waste) and mechanically separated organic fines from mixed municipal solid waste (MSW). Each of the waste streams will be separately processed at all stages.

It is estimated that by the end of 2010, the likely annual quantities of feedstock processed at the facility will be approximately 19,000 tonnes of source-separated brown bin waste (domestic and commercial) and 21,000 tonnes of mechanically separated organic waste from MSW. These quantities are estimates based on the successful roll-out of brown bin collections to domestic and commercial customers in urban areas within the Region, in line with the *'National Strategy on Biodegradable Waste'*. In line with the Strategy, the facility is designed to handle both mechanically separated and source-separated organic

waste. As source-separated collection of organic waste increases, the facility will dedicate more capacity to the separate treatment of this material.

1.4 Need for the Proposed Development

In 1998, the then Department of the Environment and Local Government (DoELG) issued the policy statement, *'Waste Management: Changing our Ways'*, which highlighted the need for a new national approach to the delivery of waste infrastructure and services. The overall outlook envisaged by this policy statement included a significantly reduced reliance on landfill in the medium to long term. The document stated that an adequate, national infrastructure to meet waste management needs would be needed to facilitate the achievement of the following targets by 2013:

- A diversion of 50% of overall household waste away from landfill.
- A minimum 65% reduction in biodegradable wastes consigned to landfill.
- The development of waste recovery facilities employing environmentally beneficial technologies, as an alternative to landfill, including the development of composting and other feasible biological treatment facilities capable of treating up to 300,000 tonnes of biodegradable waste per annum.

Though primarily directed at Local Authorities, *'Changing our Ways'* envisaged greater participation by the private sector in the provision of waste management services and infrastructure. Since 1998, the DoELG has also issued *'Preventing and Recycling Waste: Delivering Change'* (2002) and *'Taking Stock and Moving Forward'* (2004). The 2002 policy statement estimated that at the time of compiling that report, organic wastes amounted to some 60% of total municipal waste arisings, virtually all of which was then being landfilled. *'Taking Stock and Moving Forward'* stated that the recovery of biodegradable waste is a key element of the waste recovery dimension to national waste management policy and that the diversion of this waste stream from landfill will reduce methane emissions from landfill facilities, with consequential benefits from a climate change perspective. One of the key points outlined in the 2004 policy document is that Local Authorities must pay particular attention to ensuring effective engagement with the private waste industry.

The EU Landfill Directive (1999/31/EC), which was introduced in 1999, imposes restrictions on the consignment of certain waste materials to landfill, including a gradual reduction in the quantity of biodegradable municipal waste that may be deposited in landfill sites. Ireland is currently behind schedule on meeting these targets despite receiving a derogation from the EU for the initial targets. Failure to meet the target for 2010 and the subsequent targets will result in significant fines being imposed on the Irish Government. The *'National Strategy on Biodegradable Waste'*, published by the Department of the Environment, Heritage and Local Government (DoEHLG) in 2006 sets out measures to progressively divert biodegradable municipal waste (BMW) from landfill in accordance with the targets of the Landfill Directive.

The most recently published Environmental Protection Agency (EPA) National Waste Report states that during 2007, the quantity of biodegradable municipal waste disposed of to landfill increased to approximately 1.48 million tonnes, thereby moving Ireland further from the first Landfill Directive target of less than one million tonnes of biodegradable municipal waste to be landfilled in 2010. The National Waste Report identifies as a priority action for 2009 the provision of adequate infrastructure to treat the very large amounts of organic (particularly food) waste that must be collected separately and diverted from landfill. The *'National Strategy on Biodegradable Waste'* sets the following targets for organic BMW biological treatment capacity:

- 250,000 tonnes (minimum) by 2010
- 320,000 tonnes (minimum) by 2013
- 330,000 tonnes (minimum) by 2016

It is a specific objective of the *'Replacement Waste Management Plan for the Limerick/Clare/Kerry Region 2006 – 2011'* to implement and meet the targets set out in the *'National Strategy on Biodegradable Waste'*. A specific target of the Plan is to provide two additional biological treatment facilities by the end of 2007. The first annual report on the Regional Waste Management Plan, published in 2007, states no progress was made regarding this target. The report identifies that a lack of facilities for the treatment of biological waste exists in the Region, and states that such facilities need to be established.

A recent EPA publication entitled *'Hitting the Targets for Biodegradable Municipal Waste: Ten Options for Change' (2008)* confirms the lack of infrastructural capacity available in the country to meet the EU, national and regional targets. The report states that in order to comply with the Landfill Directive target for 2016, the country must develop new systems and infrastructure to manage in excess of one million tonnes of BMW, or roughly additional capacity of 110,000 tonnes every year for the next decade.

1.5 Purpose and Scope of the EIS

The purpose of this EIS is to document the current state of the environment in the vicinity of the proposed development site in an effort to quantify the possible effects, if any, of the proposed development on the environment. The assessment process that led to the compilation of this document served to highlight any areas where mitigation measures may be necessary in order to protect the surrounding environment from any negative impacts of the proposed development.

The objective of this process is to facilitate the most efficient and positive design of the proposed development in order to enable the development to be incorporated into the surrounding landscape insofar as possible and to plan for the identified effects so that measures are in place to ensure the environment is protected before any negative impacts are allowed to occur.

1.6 Structure and Content of the EIS

This EIS uses the grouped structure method to describe the existing environment, the potential impacts of the proposed development thereon and the proposed mitigation measures. Background information relating to the proposed development, scoping and consultation undertaken and a description of the proposed development are presented in separate sections. The grouped format sections describe the impacts of the proposed development in terms of human beings, flora and fauna, soils and geology, water, air, noise and climate, landscape, cultural heritage and material assets such as drainage, site services, traffic and transportation, along with the interaction of the foregoing.

The EIS also includes a non-technical summary, which is a condensed and easily comprehensible version of the EIS document. The non-technical summary is laid out in a similar format to the main EIS document and comprises a description of the proposed development followed by the existing environment, impacts and mitigation measures presented in the grouped format.

1.7 Project Team

The companies and staff listed in Table 1.1 were responsible for completion of the EIA.

Table 1.1 Project Team

Consultants	Principal Consultees	EIS Input
McCarthy Keville O' Sullivan Ltd. Block 1, GFSC, Moneenageisha Road, Galway	Lorraine Meehan Jen Fisher Dervla O' Dowd Brian Keville Pat Roberts	EIS Project Managers, Co-ordination and editing of EIS, Scoping exercise, EIS Sections 1, 2, 3, 4, 5, 9, 11.2 & 12, Appropriate Assessment
Michael Punch & Partners 97 Henry Street, Limerick	Sinead Kennedy Frances Judge	Site services, Planning drawings, Drainage and structural engineering, EIS Sections 6 & 7
Byrne Environmental Consulting Ltd. 35 Jamestown Park, Ratoath, Co. Meath	Ian Byrne	EIS Section 8: Air Quality, Climate & Noise
Byrne Mullins & Associates 7 Cnoc na Greine Square, Kilcullen, Co. Kildare	Martin Byrne	EIS Section 10: Cultural Heritage
CST Group NIB Building, Stephen Street, Sligo	Francis Fidgeon	EIS Section 11.1: Traffic & Transportation Assessment

2 BACKGROUND TO THE PROPOSED DEVELOPMENT

2.1 Site Location

The site of the proposed development is located within the Shannon Foynes Port Area, in the townland of Durnish, on the southern side of the Shannon Estuary, Co. Limerick. The site location is shown on Figure 2.1. The Shannon Foynes Port Area is located approximately 30 kilometres downstream of Limerick City. The boundary of the proposed development site, which lies in the northeastern section of the Port Area, is shown on Figure 2.2. The site is wholly owned by Greenport Environmental Ltd. and is not under the administrative control of the Shannon Foynes Port Company.

The town centre of Foynes is located approximately one kilometre southwest of the proposed development site. The village of Loghill is located approximately 6.9 kilometres to the southwest of the site, while the town of Askeaton lies approximately 8.2 kilometres to the southeast.

2.2 Site Access

The site of the proposed development is accessed via the internal roadways of the Shannon Foynes Port Area, which is in turn accessed from two separate entrances on the N69 Limerick to Tralee National Secondary Route. The N69 travels from east to west approximately 630 metres south of the proposed development site, at its nearest point. Strict security measures are in operation at both entrances to the Port Area. Access to the Port Area is restricted by automatic access barriers, which require security passes to open. Security passes are issued only to authorised persons by the Shannon Foynes Port Company.

There are two Regional Roads within a five-kilometre radius of the proposed development site. The R521 lies 1.9 kilometres south of the site at its nearest point, and travels southwards from the N69 towards Newcastle West. The second Regional Road, the R473, is located in Co. Clare and travels in an east-west direction between Clarecastle and Kilrush. This road is located on the opposite, northern side of the Shannon estuary and therefore would not be used in accessing the proposed development site. The Limerick to Foynes railway line, which is not currently operational, passes within 400 metres of the proposed development site.

2.3 Physical Characteristics of Site and Surrounding Lands

The site of the proposed development measures 17.24 acres and currently comprises a vacant, L-shaped, warehouse and external concrete surfaced yard. The warehouse is located in the northwestern corner of the site and occupies a floor space of 4,612 square metres. A view of the existing warehouse, as viewed from the east, is shown in Plate 2.1. The proposed composting and biogas facility will be constructed within the existing warehouse and in an extension to this building to be constructed in the external yard.

The topography of the site is flat. Figure 2.3 shows the site contours. In general, the lands to the east of the site are also relatively flat, while more hilly topography is found to the west and the south. Knockpatrick hill, the peak of which lies at an elevation of 172 metres O.D., is located approximately 2.4 kilometres southwest of the proposed development site.

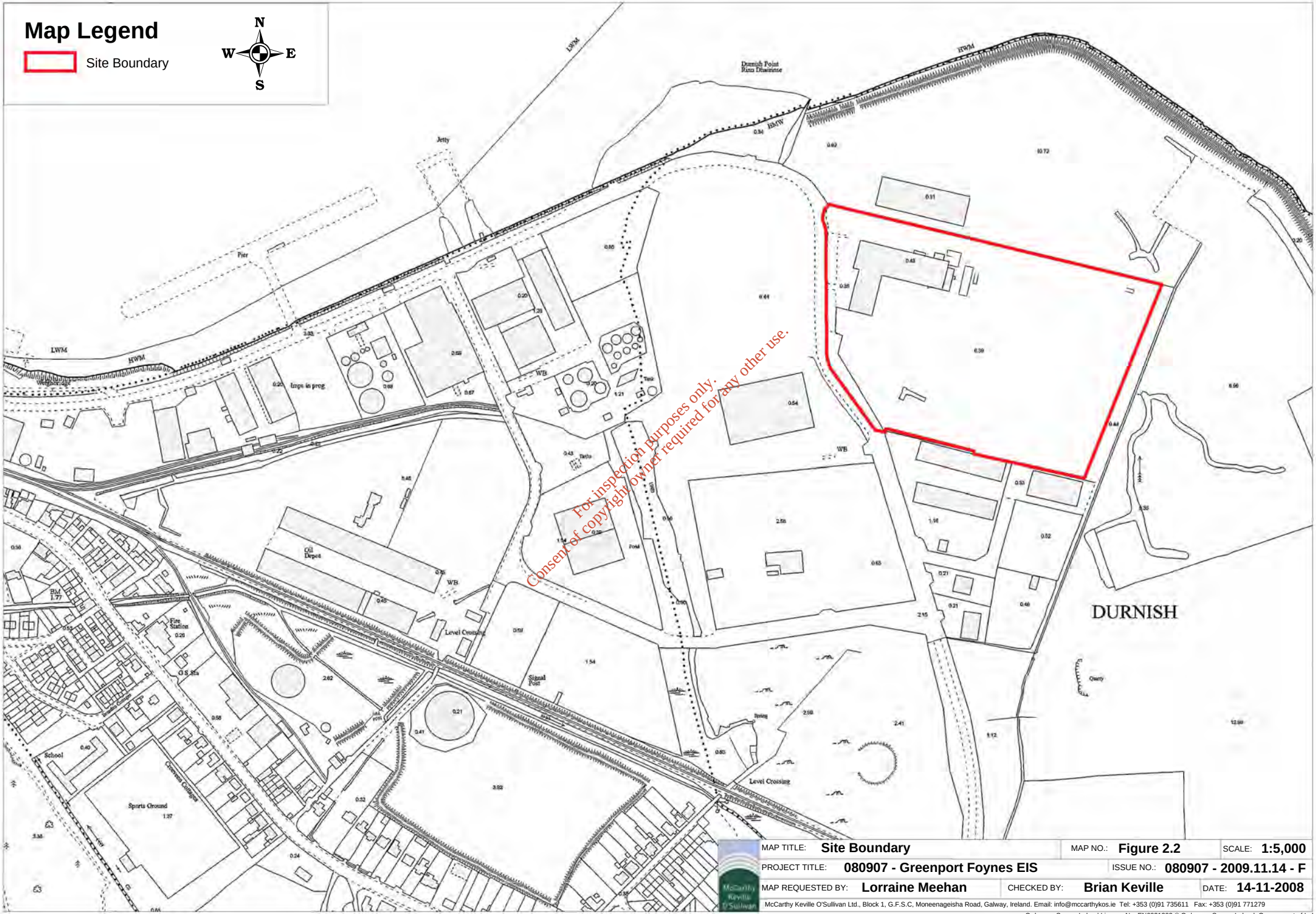
Map Legend

Site of Proposed Development

N
W E
S

MAP TITLE: **Site Location Map**			MAP NO.: **Figure 2.1**	SCALE: **1:50,000**
PROJECT TITLE: **080907 - Greenport Foynes EIS**			ISSUE NO.: **080907 - 2008.11.14 - F**	
MAP DRAWN/MODIFIED BY: **Lorraine Meehan**	CHECKED BY: **Brian Keville**		DATE: **14-11-2008**	

McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C, Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611 Fax: +353 (0)91 771279



MAP TITLE: **Site Boundary**	MAP NO.: **Figure 2.2**	SCALE: **1:5,000**	
PROJECT TITLE: **080907 - Greenport Foynes EIS**	ISSUE NO.: **080907 - 2009.11.14 - F**		
MAP REQUESTED BY: **Lorraine Meehan**	CHECKED BY: **Brian Keville**	DATE: **14-11-2008**	

McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C, Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611 Fax: +353 (0)91 771279

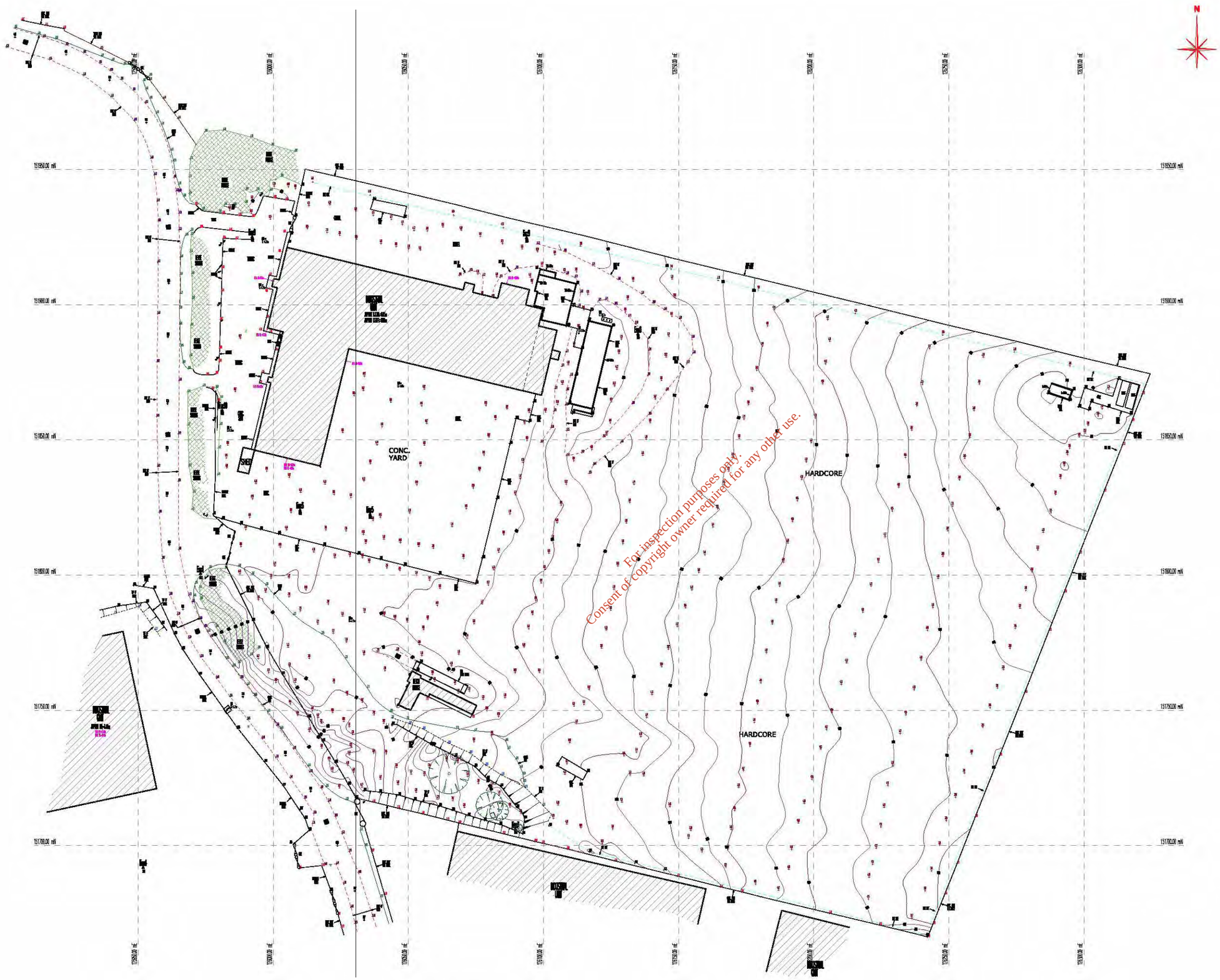


Figure 2.3

LEGEND

Key:

AIR VALVE
ARMSTRONG JUNCTION
ESB METER BOX
ESB POLE
ELECTRICITY LINE, OHED
FIRE HYDRANT
WATER METER
GAS VALVE
KERB
ROAD GULLY
INSPECTION CHAMBER
LAMP POST
MANHOLE
SIGN POST
STOCK WALK
STOPCOCK
SURVEY STATION
TELECOM INSPECTION CHAMBER
TELECOM POLE
TRAFFIC LIGHT
LIGHT BOLLARD
TREES
COMBINED SEWER
FOUL SEWER
STORM SEWER

NOTE :
1. All levels shown in metres relative to Site Ens3 Value 0.53 Metres (Ordnance Datum)
2. Contour Interval 0.25 metres. 90 sq m Holland Grid.
3. Grid measurements to be checked for paper distortion.
4. Hedge details are sketched, Apart From Where Noted.
5. Not All Individual Trees Have Been Surveyed.
6. North Refers To Magnetic North Only.
7. Only Visable Services Surveyed.

REVISIONS

No.	Date	Description

EMC SURVEYS
13 Arra View,
Newcastlewest,
Co. Limerick.
Tel. (069) 77600
Fax. (069) 77677
Mob. (087) 6702140
Email. EMCAssoc@Eircom.net

Client : James Mc Mahon Ltd.
Dock Road,
Limerick City.

Scale: 1:500 Date : 13-07-04

Project :
Survey Of Development Site
At Raheen, Co. Limerick.

Drawn By : Niall Joyce.

Description : Site Survey With Contours

Drawing Number : 04-062-01

Rev: —

The Shannon Foynes Port Area, in which the site is located, is a heavily developed industrial location. Industrial land-uses within the Port Area include dusty coal/clinker storage (outdoors), engineering, manufacturing and other warehousing. A site within the Shannon Foynes Port Area, to the west of the proposed development site, is currently being developed as a commercial fuel storage facility. Section 2.4 of this EIS presents in more detail the planning history and previous and current uses of the proposed development site and adjacent sites.

Plate 2.1 View of existing warehouse from the centre of the propose development site

The River Shannon flows from east to west, north of the Shannon Foynes Port Area. The site lies in proximity to the Lower River Shannon Special Area of Conservation (SAC) and Natural Heritage Area (NHA) and the River Shannon and River Fergus Estuaries Special Protection Area (SPA). These areas are described more fully in Chapter 5 of this EIS, Flora and Fauna. The land to the east and southeast of the site, adjacent to the Robertstown River, is owned by Irish Cement but to date has not been developed for industrial purposes.

With regards to the wider landscape, agriculture is the dominant land-use within the Shannon estuary lowlands of Limerick and Clare. Shannon Airport is located 15 kilometres northeast of the proposed development site, on the northern side of the estuary.

Aughinish Alumina Refinery is located approximately 2.4 kilometres northeast of the proposed development site, on Aughinish Island. Aughinish Alumina produces 1.8 million tonnes of alumina per annum from the treatment of approximately four million tonnes of imported bauxite, using the Bayer process. The alumina is exported to aluminium smelters throughout Europe. The waste ore from Aughinish Alumina is

spread on the western part of Aughinish Island, on an area measuring approximately 200 acres, which lies adjacent to the refinery.

2.4 Planning History

2.4.1 Proposed Development Site

2.4.1.1 Change of Use

The proposed composting and biogas facility will be located within the existing warehouse on the site of the proposed development and in an extension to this building to be constructed in the external concrete surfaced yard. A planning application was submitted to Limerick County Council by Greenport Environmental Ltd. in August 2008 for permission for the change of use of this warehouse from a timber frame construction facility to a 10,000 tonne per annum in-vessel composting facility and the removal of an existing open-ended lean-to (Planning Reference No. 08/1633). The lean-to occupies a floor space of 223.57 square metres.

Further information regarding the change of use application was submitted to Limerick County Council by Greenport Environmental Ltd. during December 2008 and February 2009. Planning permission for the change of use was granted to Greenport Environmental Ltd. in March 2009.

The change of use application was submitted to Limerick County Council shortly after Greenport Environmental Ltd acquired the site. Upon reviewing the potential sources of compostible waste in the region, the likely quantities arising requiring management, and the diversion from landfill targets for organic waste, it was subsequently decided to apply for planning permission for a facility capable of treating up to 50,000 tonnes per annum.

2.4.1.2 Previous Planning Applications and Uses

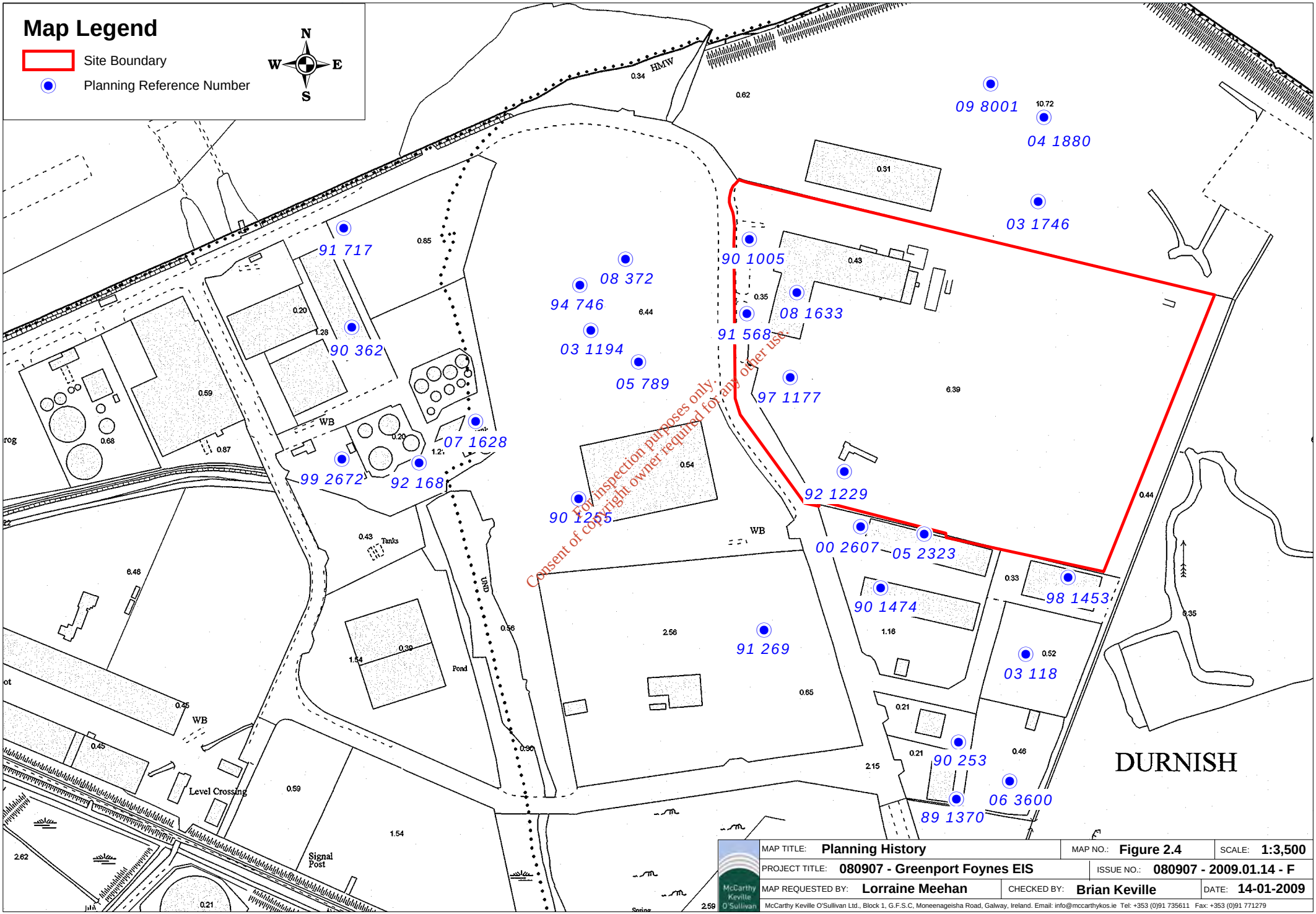
The company who last used the warehouse on the site of the propose development was ITEC Homes, which manufactured fabricated timber trusses and frames for domestic house building. Prior to this, the site was used by Koala Smokeless Fuels Ltd. for the storage of clinker, a gravel type product used in road construction. Before this, the site was used for storage purposes by Albatross Fertilisers Ltd and prior to that it was occupied by Allied Smokeless Fuels Ltd. and used for the importing, storing, screening, bagging, processing/binding and exporting of coal. Allied Smokeless Fuels Ltd. ceased trading at the site during the mid-late 1990's.

The previous planning applications for the subject site are shown in Table 2.1. This information was obtained from the Planning section of the Limerick County Council website and consultation with Michael Punch and Partners Ltd. The reference location for each application is shown in Figure 2.4.

2.4.2 Adjacent Sites

2.4.2.1 Previous Planning Applications

A search of the Planning section of the Limerick County Council website was also carried out in order to examine the planning history of the sites in the vicinity of the proposed development site. The results of this search are shown in Table 2.2. The reference locations for each application are also shown in Figure 2.4.



MAP TITLE: **Planning History**	MAP NO.: **Figure 2.4**	SCALE: **1:3,500**	
PROJECT TITLE: **080907 - Greenport Foynes EIS**	ISSUE NO.: **080907 - 2009.01.14 - F**		
MAP REQUESTED BY: **Lorraine Meehan**	CHECKED BY: **Brian Keville**	DATE: **14-01-2009**	

McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C, Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611 Fax: +353 (0)91 771279

Table 2.1 Planning History of Proposed Development Site

Planning Reference	Description	Applicant	Planning Decision
91/568	Importing, exporting, storing, screening, bagging, processing/finding, of coal and construction of plants and site works	Allied Smokeless Fuels Ltd.	Granted July 1991
92/1005	Construction of internal two-storey extension to offices for administration use	Allied Smokeless Fuels Ltd.	Granted Nov 1992
92/1229	Construction of factory for dismantling of petrol storage tanks and their reduction to scrap and storage of scrap in bins and installation of septic tank	CCBI Ltd.	Granted Jan 1993
97/1177	Change of use of part of existing smokeless fuel manufacturing plant to a fertiliser blending plant and bulk storage facility	Albatros Fertilisers Ltd.	Granted Oct 1997
08/1633	Change of use application – see Section 2.4.1 above	Greenport Environmental Ltd.	Granted Mar 2009

Table 2.2 Planning History of Adjacent Sites

Planning Reference	Description	Applicant	Planning Decision
89/1370	Erection of workshop for steel fabrication and light engineering works and associated site works	J. Moran	Granted Jan 1990
90/253	Erection of garage workshop and site works	Keane & Scanlon	Granted Apr 1990
90/362	Erection of warehouse and ancillary site works	Foynes Seabase Ltd.	Granted May 1990
90/1474	Erection of container factory, offices and associated site works	Ijver B.V.	Granted Jan 1991
90/1255	Erection of store, offices, weighbridge and ancillary facilities	Strokestown Port Services Ltd.	Granted Apr 1991
91/717	Retention of coal storage yard with site office and bagging plant	Suttons Ltd.	Granted Sept 1991
91/269	Retention of completion of coal storage, screening and grading facility, bagging plant and septic tank with associated plant and ancillary buildings	T.J. Molloy & Sons Ltd.	Granted Oct 1991
92/168	Construction of steel storage tank, ancillary pipework and bund for storage of diesel oil	Irish Bulk Liquid Storage	Granted Apr 1992
94/746	Construction of flat bulk stores, weigh bridge, offices, intake hopper, conveyor system and site works	R & H Hall	Granted Sept 1994
98/1453	Construction of a warehouse with all services	Crowley Bros.	Granted Mar 1999
99/2672	Extension to existing storage facility consisting of additional two tanks for storage of low flash product and one tank for storage of high flash product together with loading gantry and extension to existing containment bunds	Irish Bulk Liquid Storage	Granted June 2000
03/118	Construction of a warehouse for the storage of dry goods with all associated services	Crowley Bros.	Granted Mar 2003
04/1880	Construction of bulk storage building, access road with street lighting and all ancillary works	Shannon Foynes Port Company	Granted Aug 2004

Planning Reference	Description	Applicant	Planning Decision
03/1194	Facility for the storage and distribution by road of petroleum Class III (1) and Class II (1) to consist of 14 No. oil storage tanks with a total capacity of 44,300 cubic metres within concrete bund area of 0.9 Ha, loading yard area 0.1 Ha, truck wash facility, all with interceptors and outfall to estuary, truck loading bay, car parking truck parking, water storage tank, single storey operations building with gating, soft landscaping, fire service access road, oil pipelines with associated fittings within the harbour from West Jetty, East Jetty and Oil Dolphins to the facility.	Inver Resources Ltd.	Granted Sept 2004
05/2323	Construction of alterations to site layout granted under 00/2607 and construction of a new warehouse and associated site works	B. O'Connor & J. O'Donnell	Granted Dec 2005
00/2607	Construction of warehouse	Foynes Engineering Ltd.	Granted Jan 2001
03/1746	Construction of a shed for storage of anti-pollution equipment for the Shannon Estuary Anti-Pollution Team	Shannon Foynes Port Company	Granted Nov 2003
05/789	Construction of a bulk liquid warehouse and oil terminal consisting of 14 No. oil storage tanks, loading yard area, truck wash facility, truck loading bay, car & truck parking, water storage tank, two storey operations building with proprietary foul water treatment system & outfall to estuary, single storey electrical service building with electrical sub-station and boiler house, perimeter security fence and gating, landscaping, oil pipelines and associated fittings	Inver Energy Ltd.	Granted July 2005
06/3600	Erection of 2 no. warehouses for the storage of dry goods and associated site works	Aherlow Transport	Granted Aug 2007
07/1628	92 square metres, 5.5 metre high pre-fabricated drumming shed on the existing site. Retain and complete works partially completed under planning permission ref no. 99/2672 extension to existing storage facility consisting of additional 2 No. storage tanks for storage of low flash product and 1 No. tank for storage of high flash product together with loading gantry and extension to existing containment bund. Extension to the existing storage facility which will comprise 4 No. 21 metre high 17.5 metre diameter bulk storage tanks, an associated bund and gantry, an access road and parking areas in a vacant lot north of the existing facility	Irish Bulk Liquid Storage	Granted Oct 2007. (Subject to revised layout – see Planning Reference No. 08/372)

Planning Reference	Description	Applicant	Planning Decision
08/372	Bulk Liquid Warehouse and Oil Terminal. This application is an amendment to a previous successful application granted under ref. 05/789. The facility will be used for the warehousing and distribution by road and ship of petroleum Class I, Class II(1) and Class III(1) and will consist of 16 No. oil storage tanks with a capacity of 79,000 cubic metres within two impervious bund areas totalling 1.65 Ha, loading yard area 0.87 Ha, fire lane 0.24 Ha, all with interceptor and outfall to estuary, truck loading bay, car parking, truck parking, foam storage tank, two storey operations building with proprietary foul water treatment unit and outfall to estuary, single storey electrical service building with electrical sub-station and boiler house with flue, perimeter security fence and gating, soft landscaping, oil pipelines and associated fittings within the harbour.	Atlantic Fuel Supply Company Ltd.	Granted July 2008
09/8001	Oil storage facility for National Oil Reserves Agency	Atlantic Fuel Supply Company Ltd.	Application at preliminary stage

2.4.2.2 Seveso Sites

The EC (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2006 (SI No. 74 of 2006) give effect to Council Directives 96/82/EC and 2003/105/EC, hence implementing the 'Seveso II' Directive. A Seveso site is an industrial premises that has notified the Health and Safety Authority (HSA) as meeting a specific threshold for quantities of hazardous substances as outlined in the Regulations. The Seveso Directive incorporates land-use planning principles in its goals in order to limit the consequences of major accidents involving dangerous substances for human beings and the environment. This includes controls on the siting of new Seveso sites, modifications to existing Seveso sites and controls on new developments in the vicinity of existing Seveso sites.

The Limerick County Development Plan 2005 – 2011 states that there is currently one industry affected by the Seveso Directive within the county, namely Irish Bulk Liquid Storage Ltd., which is located within the Shannon Foynes Port Area. This site is listed on Table 2.2 above, under Planning Reference Nos. 92/168, 99/2672 and 07/1628.

The HSA has established consultation distances surrounding premises designated as containing hazardous substances. A consultation distance of 500 metres surrounding the Irish Bulk Liquid Storage site has been established by the HSA, as stated in the Limerick County Council Development Plan. The policy of Limerick County Council with regards to proposed developments adjacent to existing Seveso establishments and consultation with the HSA is presented in Chapter 5 of the Plan on Economic Development:

"Policy ED 30 – Proposed Development Adjacent to Existing Establishments: The Health and Safety Authority has established consultation distances surrounding establishments designated as containing hazardous substances. It is the policy of the Council, in addition to normal planning criteria to ensure that new developments such

as transport links, locations frequented by the public and residential areas in the vicinity of existing establishments, where the siting or developments are such as to increase the risk or consequences of a major accident, within these distances, complies with the requirements of the Major Accidents Directive. The Council will consult with the Health and Safety Authority regarding any such proposals."

A list of all sites covered by the Seveso Regulations is available on the HSA website. In addition to the existing sites, it also lists establishments that have been granted planning permission but have not yet been constructed or are currently undergoing construction, including the Inver Resources Ltd. site, which is located within the Shannon Foynes Port Area. This site is also referred to on Table 2.2 above, under Planning Reference Nos. 03/1194 and 05/789. The application has been superceded by the Atlantic Fuel Supply Company Ltd. planning application 08/372.

The site to the north of the proposed development site is proposed to be developed by Atlantic Fuel Supply Company Ltd. for National Oil Storage Agency reserves, and will also be classified as a Seveso site. The planning application for this site is still at the preliminary stage.

The locations of the Irish Bulk Liquid Storage and the Atlantic Fuel Supply Company sites in relation to the site of the proposed development are shown on Figure 2.4.

2.5 Strategic Planning Context

This section of the Environmental Impact Statement (EIS) sets out the strategic and statutory planning context for the proposed development at Foynes, Co. Limerick. It examines the national, regional and local planning policy context established by Government and Environmental Protection Agency (EPA) guidelines, the Mid Western Regional Planning Guidelines 2004, the Limerick/Clare/Kerry Regional Waste Management Plan, and the Limerick County Development Plan 2005 – 2011.

2.5.1 National Waste Management Policy

2.5.1.1 'Waste Management: Changing Our Ways' 1998

In 1998, the then Department of the Environment and Local Government (DoELG) issued the policy statement, *'Waste Management: Changing our Ways'*, which highlighted the need for a new national approach to the delivery of waste infrastructure and services. The goals presented in this document were firmly grounded in the internationally recognised waste management hierarchy of options: prevention, minimisation, reuse, recycling, recovery and disposal, where prevention is the most preferred option and disposal the least preferred.

Though primarily directed at Local Authorities, *'Changing our Ways'* envisaged greater participation by the private sector in the provision of waste management services and infrastructure. It stated that an adequate, national infrastructure to meet waste management needs would be needed to facilitate the achievement of the following targets over a fifteen-year timescale, by 2013:

- A diversion of 50% of overall household waste away from landfill. The percentage of household waste sent to landfill during 1998 was calculated at approximately 92%, as stated in the National Waste Report for that year published by the Environmental Protection Agency (EPA).

- A minimum 65% reduction in biodegradable wastes consigned to landfill. The EPA National Waste Report for 1998 states that during that year approximately 1,003,053 tonnes of biodegradable waste were consigned to landfill. 65% of this figure amounts to approximately 652,000 tonnes.

- The development of waste recovery facilities employing environmentally beneficial technologies, as an alternative to landfill, including the development of composting and other feasible biological treatment facilities capable of treating up to 300,000 tonnes of biodegradable waste per annum. The National Strategy on Biodegradable Waste 2006, as described in Section 2.5.1.4 of this EIS, states that in 2004 the figure for total biological treatment capacity in Ireland then stood at approximately 100,000 tonnes per annum.

- Recycling of 35% of municipal waste.

- Recycling at least 50% of C&D waste within a five-year period, with a progressive increase to at least 85% over fifteen years.

- Rationalisation of municipal waste landfills, with progressive and sustained reductions in numbers, leading to an integrated network of some 20 state-of-the-art facilities incorporating energy recovery and high standards of environmental protection.

- An 80% reduction in methane emissions from landfill, which will make a useful contribution to meeting Ireland's international obligations.

The overall outlook envisaged by the 1998 DoELG policy statement included a significantly reduced reliance on landfill in the medium to long term. It referred to the then Draft Landfill Directive, which would require each Member State to draw up a national strategy for the reduction of the proportion of biodegradable municipal waste going to landfill and would impose a series of mandatory reduction targets, culminating in a 65% reduction within 15 years. The document stated that each Member State would have to develop the infrastructure to segregate and treat very substantial volumes of organic wastes. For Ireland, this implied a minimum diversion from landfill of over 0.6 million tones of biodegradable waste annually, at 1998 waste generation levels. The meeting of Landfill Directive targets is further discussed in Section 2.5.1.4 of this EIS.

'Changing Our Ways' stated that insufficient consideration had been given to reducing reliance on landfill by means of diverting waste to alternative recycling, recovery or treatment options and that this situation would have to change radically. The document also stated that no one solution can address all waste management requirements, and consequently the emphasis must be placed on integrated waste management. Composting and anaerobic digestion are discussed in the 1998 policy statement under the heading of Alternative Thermal and Bio Technologies. With regards to composting, the policy document stated that this is a potentially significant technology, which merits detailed consideration in any waste management planning process. Composting is described as an aerobic treatment process that is well suited to dealing with the biodegradable organic fraction of household waste. The potential environmental impacts of composting can be readily addressed by careful site selection and the application of appropriate technologies to control emissions. In referring to anaerobic digestion, *'Changing Our Ways'* stated that the scope for the application of this process in the treatment of organic municipal wastes in Ireland

should be examined. Anaerobic digestion has the advantages of recovering energy and reducing emissions of methane to the atmosphere.

2.5.1.2 'Preventing and Recycling Waste: Delivering Change' 2002

The Department of the Environment and Local Government policy statement *'Preventing and Recycling Waste: Delivering Change'* was published in 2002. This document evolved from and was grounded in the 1998 *'Changing Our Ways'* policy statement and stated that while that document generated much good will, this now had to be translated into action. It addressed the factors and practical considerations that are relevant to the achievement of Government policy objectives and to the prevention and recovery of waste.

Chapter 7 of the DoELG 2002 policy statement discusses the promotion of biological treatment of organic waste, which encompasses both composting (aerobic) and anaerobic digestion. The document estimates that at the time of preparing that report, organic wastes amounted to some 60% of total municipal waste arisings, virtually all of which was then being landfilled. It also refers however to regional and local waste management plans that provide generally for the development of a network of centralised biological treatment facilities for organic municipal waste. The document states that both the energy and nutrient contents of biodegradable waste are recovered through anaerobic digestion. The generation of electricity from the biogas that is produced in the process has the potential to replace non-renewable power sources such as fossil fuels.

2.5.1.3 'Taking Stock and Moving Forward' 2004

During 2004 the Department of the Environment, Heritage and Local Government published *'Taking Stock and Moving Forward'* in order to provide a review of progress made on waste management modernisation since the publication of *'Changing Our Ways'* in 1998 and to set out a programme of key points that would underpin future progress. The document states that the recovery of biodegradable waste is a key element of the waste recovery dimension to national waste management policy:

"Given that it accounts for some 65% of the municipal waste stream and can be readily recovered, it is an area for priority attention. The diversion of this waste stream from landfill is the subject of ambitious EU and national targets and will also reduce methane emissions from landfill facilities, with consequential benefits from a climate change perspective."

2.5.1.4 Landfill Directive and the 'National Strategy on Biodegradable Waste' 2006

The EU Landfill Directive (1999/31/EC) was introduced in 1999. In addition to setting demanding new standards for all landfills in order ot improve environmental protection, the Directive requires Member States to reduce their dependence on the landfilling of municipal waste in favour of more environmentally sound alternatives. It imposes restrictions on the consignment of certain waste materials to landfill, including a gradual reduction in the quantity of biodegradable municipal waste that may be deposited in landfill sites. Biodegradable waste comprises organic or natural materials that break down over time (biodegrade) by natural processes. Biodegradable municipal waste (BMW) is largely produced by households and commerce, and comprises mainly paper, cardboard, food waste and garden waste. Article 5 of the EU Landfill Directive 1999/31/EC sets the following targets for diversion of biodegradable municipal waste (BMW) from landfill by Member States:

- No later than 16th July 2006, biodegradable municipal waste going to landfills must be reduced to 75% of the total amount (by weight) of biodegradable municipal waste produced in 1995.

- No later than 16th July 2009, biodegradable municipal waste going to landfills must be reduced to 50% of the total amount (by weight) of biodegradable municipal waste produced in 1995.

- No later than 16th July 2016, biodegradable municipal waste going to landfills must be reduced to 35% of the total amount (by weight) of biodegradable municipal waste produced in 1995.

Each Member State was obliged under the Directive to complete and submit to the European Commission a National Strategy on the proposed actions that will implement the BMW landfill diversion targets. The *'National Strategy on Biodegradable Waste'* was published by the Department of the Environment, Heritage and Local Government in 2006 and is grounded in the integrated waste management approach established as Government policy in *'Changing Our Ways'* in 1998. The Strategy sets out measures to progressively divert biodegradable municipal waste (BMW) from landfill in accordance with the targets set out in the Landfill Directive.

Member States that consigned more than 80% of collected municipal waste to landfill in 1995 were allowed to postpone the attainment of the landfill diversion targets by a period not exceeding four years. The EPA National Waste Database Report 1995 records that during that year Ireland consigned some 92% of collected municipal waste to landfill. Accordingly, Ireland is entitled to claim derogation to the targets set out in the Landfill Directive for a maximum period of four years. The *'National Strategy on Biodegradable Waste'* states that Ireland proposes to avail of the four-year derogation for the first two phases of the biodegradable municipal waste diversion targets from landfill as allowed by the Directive. Accordingly, the Strategy is based on a first phase target date of 2010 (deferred from 2006) and a second phase target date of 2013 (deferred from 2009).

Based on data produced in the 1995 National Waste Report, which was subsequently refined through additional information acquired by the EPA since the publication of that report, the baseline figure for generation of biodegradable municipal waste (BMW) in Ireland during 1995 was calculated at 1,289,911 tonnes. This baseline figure allowed specific figures for the amount of biodegradable municipal waste that will be allowed to go to landfill by each of the target years to be calculated. These amounts as set out in the *'National Strategy on Biodegradable Waste'* are shown in Table 2.3.

Table 2.3 National Targets for Landfilling of BMW

Year	Target	Tonnes of BMW allowed to landfill
2010	75% of quantity generated in 1995	967,433
2013	50% of quantity generated in 1995	644,956
2016	35% of quantity generated in 1995	451,469

The *'National Strategy on Biodegradable Waste'* sets specific objectives for the contributions of recylcing, biological treatment and residual treatment (generally thermal treatment with energy recovery) to the achievement of the targets for diversion of BMW from landfill. The targets for each process for 2010, 2013 and 2016 are shown in Table 2.4. The Strategy proposes that by 2016 the biological treamtent

of BMW (mainly food and garden waste) will divert over 440,00 tonnes of this waste stream from landfill.

Table 2.4 BMW Diversion Tarets for 2010, 2013 and 2016

Treatment	2010		2013		2016	
	Percent of BMW	Tonnes Diverted	Percent of BMW	Tonnes Diverted	Percent of BMW	Tonnes Diverted
Recycled	32.2%	765,050	36.9%	876,849	38.6%	875,371
Biological Treatment*	14.2%	338,129	17.5%	414,546	19.5%	442,129
Residual Treatment	13.0%	308,904	18.5%	438,190	22.0%	499,762
Total Diversion	**59.4%**	**1,142,083**	**72.9%**	**1,729,585**	**80.1%**	**1,817,262**
Landfilled	40.6%	967,433	27.1%	644,956	19.9%	451,469

** Biological treatment is defined in the Strategy as composting, anaerobic digestion, mechanical-biological treatment or any other process for stabilising and sanitising biodegradable waste.*

2.5.1.5 EPA National Waste Reports

The EPA National Waste Report 2007, published in 2009, is the most recent in the series of National Waste Reports that are published annually by the Environmental Protection Agency. The scope of the 2007 report is waste generation and management in the Republic of Ireland. The key waste streams covered are municipal waste (with a focus on household waste), packaging waste, biodegradable municipal waste, industrial waste, hazardous waste and construction and demolition waste.

The EPA National Waste Report for 2007 found that during that year:

- The generation of municipal waste increased by 0.4% to 3,397,683 tonnes.
- While the recycling of municipal waste increased by 3.6% to an overall rate of 36.5%, the disposal of municipal waste to landfill also increased by 1.7%.
- The quantity of biodegradable municipal waste disposed of to landfill increased by 4% to 1,475,077 tonnes, moving Ireland further from the first Landfill Directive target of less than one million tonnes of biodegradable municipal waste to be landfilled in 2010.
- Less than 9% of organic wastes were recovered in 2007.

Following the review of waste generation and management for the year, the report states:

"Although significant progress has been made in managing waste in Ireland, there are still some major challenges to be addressed in managing our waste and meeting Ireland's commitments regarding biodegradable waste."

It also states:

"The recovery and recycling of organic (food and garden) waste is disappointing. Despite the looming landfill diversion targets for biodegradable municipal waste, and the fact that the organics fraction is where attention must be focused, recovery increased only to 78,617 tonnes. Ireland continues to move further away from the target for 2010."

Table 2.5, reproduced from the EPA Report, shows Ireland's current position with regards to meeting the diversion targets of Landfill Directive 1999/31/EC.

Table 2.5 Targets and Current Position for Diversion of Biodegradable Waste from Landfill

Target Year	Landfill Directive Target	Maximum Quantity Allowed to Be Landfilled
2010	75% of quantity generated in 1995	967,433
2013	50% of quantity generated in 1995	644,956
2016	35% of quantity generated in 1995	451,469
Current Position		**Quantity Landfilled**
2004		1,304,426
2005		1,307,570
2006		1,412,581
2007		1,475,077

The National Waste Report 2007 recognises that *"the diversion of very large quantities of food waste from landfill is a priority that must be addressed"*, and identifies the following priority actions:

- Putting in place the services for the separate collection of organic (particularly food) waste at households and commercial premises.
- Ensuring there is adequate infrastructure to treat the very large amounts of organic (particularly food) waste that must be collected separately and diverted from landfill.
- Developing outlets for the products of such treatment.

Chapter 10 of the EPA's National Waste Report 2006 refers to waste infrastructure. With regards to mechanical biological treatment (MBT), the report states this is a process which encompasses a combination of technologies brought together in an integrated system, and can enhance recycling performance where kerbside recycling is already employed, by extracting a further fraction of residual recyclable material:

"An MBT plant combines mechanical processes to separate out dry recyclables such as glass and metals, and biological processes to drive out moisture and to handle the organic-rich fraction of the incoming waste. The organic-rich fraction is suitable for biostabilisation (producing a low grade compost) or anaerobic digestion."

The EPA report found that the majority of facilities were applying some form of mechanical sorting to residual household and commercial waste but that the organic fines produced were being disposed of at landfill. In one case the fines were being sent for stabilisation at a composting facility in Northern Ireland.

"In 2006, there were few facilities treating the organic fines fraction on site so the biological treatment was happening at another facility if at all. In most cases, the organic fines were disposed of directly to landfill. A total of 469,963 tonnes of organic fines were disposed of at EPA-licensed landfills in 2006 although some of this is probably from the mechanical treatment of construction and demolition waste. In the case of the facilities that do produce a biologically stable product for use as landfill cover, there is still uncertainty as to whether the product will meet the requirements of the Landfill Directive for the diversion of biodegradable waste."

The majority of feedstocks to be treated at the proposed composting and biogas facility is likely to be sourced from the Mr. Binman Ltd. waste transfer station and recycling centre in Luddenmore, Grange, Co. Limerick and from source separated organic waste collections. Mr. Binman Ltd. is one of the largest independent waste

recovery operators in the country, collecting non-hazardous household, commercial and construction and demolition waste from approximately 60,000 customers in the Mid-West and South-East Regions. The majority of mixed municipal waste entering the Mr. Binman Ltd. facility at Luddenmore is processed through the mechanical biological treatment (MBT) plant, which separates the residual waste into recyclable/residual components. At present, due to a lack of suitable composting facilities in the region and nationally, the majority of organic fines extracted from mixed municipal waste at this stage of the process are sent to landfill.

2.5.2 Mid Western Regional Planning Guidelines 2004

Under the provisions of the Planning and Development Act 2000, the Minister for the Environment and Local Government directed each of the State's eight Regional Authorities to prepare and adopt Regional Planning Guidelines for their respective administrative areas. The Mid West Regional Planning Guidelines were published in 2004 and set out guidelines for the development of the Co. Clare, Co. Limerick, Limerick City and North Tipperary within the framework of the Government's National Spatial Strategy and other national, regional and local strategies.

The aim of the Mid West Regional Planning Guidelines is to provide a broad context within which the physical planning of the region can be co-ordinated and to provide a planning framework for the county, city and town authorities that are charged with the implementation of the Planning and Development Act at local level. The principles of sustainable development inform all of the regional policies, in particular securing a proper balance between social, economic, environmental and equity aspects of development.

The Mid West Region is divided into nine zones. The proposed development site is located in Zone 5, the Shannon Estuary Zone or the West Limerick Zone. Zone 5 is described in the Guidelines as demonstrating population decline, a poor settlement structure, limited accessibility and a modest level of social and community services. It is also in a mixed situation with regard to resources. From an agricultural point of view the land is of medium quality. It has however the potential of the Shannon Estuary available to it, for example as the possible location of a strategic development zone.

The key targets for the Mid West Region with regards to waste management are set out in Section 2.9 of the Planning Guidelines. They include the reduction of waste going to landfill and the promotion of prevention, minimisation, re-use and recycling of waste. Disposal is the least preferred option with regards to waste management. The Strategic Framework for the Region is set out in Section 5 of the Guidelines. The general strategy for waste disposal is presented in Section 5.6 and states:

"Waste disposal within the area is addressed through the regional waste management plans. There are two plans that apply to the region, one covering Clare, Limerick and Kerry and the other covering Tipperary and the Midland Counties. These strategies envisage the provision of a range of waste minimisation and waste disposal facilities. It is important that these strategies are regularly reviewed and that they are both implemented and updated in line with changing technology and best practice."

2.5.3 Regional Waste Management Plan

2.5.3.1 Limerick/Clare/Kerry Waste Management Plan 2001

The Limerick/Clare/Kerry Waste Management Plan, which was adopted in 2001, is modelled on the 1998 Government policy statement *'Changing Our Ways'*. This policy document stated the need for a new approach by Local Authorities to environmental management that involved constructive co-operation with both local communities and neighbouring Local Authorities. The Regional Waste Management Plan was prepared jointly by the Local Authorities of Limerick County, Limerick City, Clare and Kerry in accordance with the legislative requirements and policy statements to organise waste management in an integrated fashion on a regional basis. The Plan encompasses the planning, regulation, collection, recycling, recovery and disposal of non-hazardous wastes generated within the Mid West Region and sets out the policy for an integrated approach to waste management over a 25-year period.

The Limerick/Clare/Kerry Regional Waste Management Office was established in order to facilitate and coordinate the efforts of the partner Local Authorities in implementing the objectives and meeting the targets of the Regional Waste Management Plan, and to facilitate where possible the efforts of industry in preventing and minimising the production of waste in the Mid West Region.

2.5.3.2 Replacement Limerick/Clare/Kerry Waste Management Plan 2006 – 2011

The Local Authorities of Limerick City, Limerick County, Clare and Kerry agreed in June 2004 to review the 2001 Regional Waste Management Plan, and a Replacement Plan was subsequently published in June 2006. The Replacement Waste Management Plan for the Limerick/Clare/Kerry Region 2006 – 2011 details the progress made since the adoption of the 2001 Plan and sets out proposals for the minimisation and treatment of waste produced in the Region going forward.

It is an essential element of the 2006 Plan to ensure the provision of adequate infrastructure for the Region. The Plan states that the Limerick/Clare/Kerry Local Authorities recognise the value of private investment in realising this aim. It also states that the private waste sector has become increasingly involved in waste management in the Region. In line with this increased participation, the roles and responsibilities of the private sector with regards to waste management, as set out in Section 18.5 of the Regional Waste Management Plan 2006 – 2011, include:

- Implementation of the requirements of the Waste Management Plan in line with the principles of the Waste Hierarchy.
- Ensure that waste does not cause environmental pollution.
- Ensure that all waste activities are adequately licensed or permitted.
- Compliance with the requirements of all waste permits/licences.
- Use of Best Available Technology.
- Explore and introduce innovative waste management technologies.
- Co-operate with Local Authorities in relation to the provision of waste collection services in peripheral areas.
- Assist local authorities to reduce the amount of uncollected waste in the Region.
- To promote education and awareness regarding waste management.

With respect to biological treatment capacity, the policy stated in the Regional Plan is:

"To reduce the quantity of biodegradable waste landfilled in accordance with the EU landfill Directive. An integrated approach to waste management will require treatment technologies such as mechanical biological treatment in order to reach the 2010 and 2013 landfill diversion targets and to meet the 2010 target set out in the National Biowaste Startegy."

Two key objectives of the Plan are:

- To achieve the 2010 target as set out in the *National Strategy on Biodegradable Waste* through a combination of source separated collection and appropriate treatment, combined with collections with other waste streams, with appropriate mechanical biological treatment, home composting and green waste recycling.
- To facilitate the development of Biological Treatment in the Region.

A specific target is set out in the Plan to provide two additional biological treatment facilities for the Region by the end of 2007. Table 20.4 of the Replacement Waste Management Plan presents the future infrastructure targets and associated capital costs for the region. The targets regarding Biological Treatment are shown in Table 2.6 below:

Table 2.6 Future Infrastructure and Estimated Capital Costs

Infrastructure	Provider	Estimated Cost (€)	Timetable
Biological Treatment	Local Authorities (x 1) Private Sector (x 1)	€8 million (x2)	Capacity in the Region for biological treatment of 30,000 tonnes per annum in Region by 2007. A private sector facility of similar size may also be developed.

2.5.3.3 Replacement Limerick/Clare/Kerry Waste Management Plan: Annual Report 2007

The first annual report on the Replacement Limerick/Clare/Kerry Waste Management Plan 2006 – 2011 was published in 2007 and details the progress made on the targets that were set for waste generation rates, recycling rates, prevention awareness and prevention initiatives, infrastructural developments and enforcement. The report states that while considerable progress was made in meeting the targets of the Replacement Waste Management Plan, significant challenges remain particularly in siting new waste infrastructure. It states that no progress was made regarding the targets for the provision of two additional biological treatment facilities, as set out in Table 2.5 above. The Annual Report identifies that there exists in the region a lack of facilities for the treatment of biological waste and that such facilities need to be established.

2.5.4 Limerick County Development Plan 2005 – 2011

This section of the EIS sets out the policies of Limerick County Council with regards to waste management, economic development and employment growth, and development within the Shannon Estuary.

2.5.4.1 Waste Management

The policies and objectives of Limerick County Council with regards to waste management are listed in Chapter 8 of the County Development Plan 2005 – 2011. In

relation to the overall strategy for infrastructure within the county, it is a principle of the Planning Authority to promote the development and raise awareness of waste management issues by encouraging the minimisation, re-use, recycling and recovery of waste. The relevant waste management policies of Limerick County Council include:

- *Policy INF 30 – Regional Waste Management Plan: It is the policy of the Council to implement the provisions of the Waste Management Hierarchy and the Regional Waste Management Plan. All prospective developments in the county will be expected to take account of the provisions of the Regional Waste Management Plan and adhere to those elements of it that relate to waste prevention and minimisation, waste recycling facilities, and the capacity for source-segregation.*

- *Policy INF 21 – Education and Awareness: It is the policy of the Council to promote education and awareness on all issues associated with waste management, both at industry and community level. This will include the promotion of waste reduction by encouraging the minimisation, re-use, recycling and recovery of waste within the county.*

- *Policy INF 32 – 'Polluter Pays Principle': It is the policy of the Council to ensure the provision of quality cost effective waste infrastructure and services, which reflect and meet the needs of the community and to ensure that the 'polluter pays' principle is adhered to in all waste management activities.*

- *Policy INF 36 – Provision of Transfer Facilities: It is the policy of the Council to support the development of recycling sites/waste disposal sites or transfer stations and associated developments in appropriate locations, subject to normal planning and environmental sustainability considerations. In assessing applications for these types of development, the Planning Authority will have regard to the Groundwater Protection Plan and appropriate response matrix.*

The County Development Plan refers to the Protection of the Environment Act 2003, which states under Section 26(2)(c) that Development Plans are deemed to include the objectives contained in the Regional Waste Management Plan:

"The Development Plan for the time being in force in relation to the functional area of a Local Authority shall be deemed to include the objectives for the time being contained in the waste management plan in force in relation to that area".

Under the same section of the Act, it is stated that the objectives of the Waste Management Plan will override the objectives of the Development Plan, where there is a conflict between the two.

2.5.4.2 Economic Development

The policies and objectives of Limerick County Council with regards to economic development are presented in Chapter 5 of the County Development Plan. The main principles of the Planning Authority with respect to the provision of adequate employment land, balanced development and employment growth include:

- *Facilitate the provision of adequate land for employment uses, including sites at suitable locations for industrial, enterprise, retail and other small*

business uses having regard to spatial planning, infrastructural, environmental and transportation requirements and compatibility with adjoining land uses.

- *Support and protect the existing economic base and seek to diversify the economy through both inward investments at key growth areas and promotion of agriculture and forestry, aqua-culture, maritime and tourism-related industries in the rural areas.*

- *Secure the county's role as a location for economic growth in the Mid-West Region and ensure the employment benefits are balanced across the whole county.*

2.5.4.3 The Shannon Estuary

Chapter 9 of the Limerick County Development Plan 2009 – 2015 presents the policies of the Planning Authority for development within the Shannon Estuary region based on the following main principles:

- *Support and expand the existing economic base, including port and harbour facilities and related activities, and seek to diversify the economy through the promotion of industrial/business and employment opportunities, environmentally friendly aqua-culture, maritime, water related recreation and tourism industries in a sustainable manner.*

- *To properly protect, manage and enhance the natural coastal environment, cultural and built heritage of the Estuary Area.*

Section 9.6 of the County Development Plan relates to Alternative Energy in the estuary. The Plan states that while the potential for wind energy development is somewhat limited due to the low-lying topography of the area and the scenic amenity of the estuary zone as a whole, there are other aspects of renewable energy which could, subject to environmental and ecological criteria be located within the estuary area. These include the possibility for the use of biomass, i.e. anaerobic digestion, wood fuels, and wave and tidal power. The policy of Limerick County Council with regards to Alternative Energy in the estuary area is:

Policy SE 8 – Alternative Energy: The council will be supportive of wind energy developments within the townlands indicated in the wind energy strategy, subject to good planning criteria while it will support the development of other alternative energy sources throughout the estuary zone subject to proper planning and sustainable development, while respecting the constraints of the SAC (Special Area of Conservation) designation.

With regards to the potential impacts of development in the Shannon Estuary zone, the Plan also states the policies of the Planning Authority to safeguard this environment:

- *Policy SE 12 – Protected Areas: Development proposals within areas designated as nature conservation areas (Special Areas of Conservation, Special Protection Areas for wild birds or Natural Heritage Areas) will not normally be permitted. Consideration will be given to proposals that demonstrate that they have no significant direct or indirect adverse impacts on the area, or protected species and habitats and that they are appropriate in terms of scale and design to the surrounding area.*

- *Policy SE 13 – Water Quality: Development proposals in the Shannon estuary Area will be required to have regard to the quality of the water resources in the area. They will be required to demonstrate that they will have no significant adverse consequences for water quality.*

2.6 Scoping & Consultation

2.6.1 Scoping Document

Scoping is the process of determining the content, depth and extent of topics to be covered in the environmental information to be submitted to a competent authority for projects that are subject to an Environmental Impact Assessment (EIA). This process is conducted by contacting the relevant authorities and Non-Governmental Organisations (NGOs) with interest in the specific aspects of the environment likely to be affected by the proposal. These organisations are invited to submit comments on the scope of the EIA and Environmental Impact Statement (EIS) and the specific standards of information they require. Comprehensive and timely scoping helps ensure that the EIA refers to all relevant aspects of the proposed development and its potential effects on the environment and provides initial feedback in the early stages of the project, when alterations are still easily incorporated into the design. In this way scoping not only informs the content and scope of the EIA, it also provides a feedback mechanism for the proposal design itself.

A scoping report, providing details of the application site and the proposed development, was prepared by McCarthy Keville O'Sullivan Ltd. and circulated on 14th November 2008 to the consultees listed in Table 2.7. McCarthy Keville O'Sullivan Ltd. requested the comments of the relevant personnel/bodies in their respective capacities as consultees with regards to the EIA process.

2.6.2 Scoping Responses

This section of the EIS presents a summary of the main recommendations that were made in the replies to the scoping document. These recommendations have informed the EIA process and the contents of the EIS. Copies of the scoping responses received by 30th April 2009 are included in Appendix 1 of this EIS. If further responses are received, the comments of the consultees will be considered in the construction and operation of the proposed development, subject to the grant of planning permission.

Table 2.7 EIA Consultees

No.	Name & Address of Consultee	Response
1	Development Applications Unit (DAU), Department of the Environment, Heritage and Local Government, Dún Scéine, Harcourt Lane, Dublin 2	Letters received 9th and 10th Dec 2008, and 23rd Mar 2009
2	An Taisce, Tailor's Hall, Back Lane, Dublin 8	Letter received 20th Nov 2008
3	Ms. Yvonne Furlong, Office of Climate, Licencing & Resource Use, Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford	No response received as of 30th Apr 2009
4	Mr. Michael Fitzsimons, Senior Fisheries Environmental Officer, Shannon Regional Fisheries Board, Ashbourne Business Park, Dock Road, Limerick	No response received as of 30th Apr 2009
5	Headquarters, Mid-West Regional Authority, Friar Court, Abbey Street, Nenagh, Co. Tipperary	Letter received 27th Nov 2008
6	Ms. Eileen Clifford, Engineering Services, Office of Public Works, Engineering Services Division, 51 St. Stephen's Green, Dublin 2	Letter received 12th Feb 2009
7	Planning Section, Limerick Co. Council, County Hall, Dooradoyle, Co. Limerick	No response received as of 30th Apr 2009
8	Water Services Section, Limerick Co. Council, County Hall, Dooradoyle, Co. Limerick	No response received as of 30th Apr 2009
9	Roads Section, Limerick Co. Council, County Hall, Dooradoyle, Co. Limerick	No response received as of 30th Apr 2009
10	Mr. Tom O'Neill, Heritage Officer, Forward Planning Section, Limerick Co. Council, County Hall, Dooradoyle, Co. Limerick	Email received 25th Nov 2008
11	National Roads Authority, St. Martin's House, Waterloo Road, Dublin 4	Letter received 12th Dec 2008
12	Regional Waste Management Office, Limerick Co. Council, County Hall, Dooradoyle, Co. Limerick	Letter received 14th Jan 2009
13	Mr. Oran O'Sullivan, BirdWatch Ireland, Rockingham House, Newcastle, Co. Wicklow	No response received as of 30th Apr 2009
14	Department of Agriculture, Fisheries & Food, Agriculture House, Kildare Street, Dublin 2	No response received as of 30th Apr 2009

2.6.2.1 Department of the Environment, Heritage and Local Government

Two letters were received from the Development Applications Unit (DAU) of the Department of the Environment, Heritage and Local Government (DoEHLG) on 9th and 10th December 2008, which set out the archaeological and architectural heritage recommendations of the respectively. The letters stated that the Department would require a full archaeological impact assessment of the proposed project and that the EIA should take into account the effect of the proposal on the architectural heritage of the area. The recommendations of the DAU with regards to archaeological and architectural heritage have been addressed in Chapter 10 of this EIS on Cultural Heritage.

A third letter was received from the DAU on 23rd March 2009, which set out the nature conservation recommendations of the National Parks & Wildlife Service (NPWS) of the DoEHLG. The letter stated that an appropriate assessment of the potential impact of the proposed development on the water quality of the River Shannon

Special Area of Conservation and disturbance to birds in the River Shannon and River Fergus Estuaries Special Protection Area would be required. It also recommended that the applicant ensures no light should shine on the shore line. The results of the appropriate assessment of the proposal are set out in Appendix 8 of the EIS.

2.6.2.2 An Taisce

The letter received from An Taisce stated that information on the type of material proposed for composting and the catchment area of material in order to assess traffic generation would be required. These points have been addressed in Chapter 3 of the EIS, Description of the Proposed Development.

2.6.2.3 Office of Public Works

The response from the Office of Public Works (OPW) recommended that the flood risk management aspect to the development be considered. The comments of the OPW are addressed in Chapter 7 of this EIS on hydrology and hydrogeology.

2.6.2.4 Heritage Officer, Limerick County Council

The email received from Mr. Tom O'Neill, Heritage Officer with Limerick County Council requested that the following points be addressed as part of the EIA:

- Potential compost materials to be imported to the site, including source.
- Storage of material prior to composting.
- Detailed description of the in-vessel composting facility.
- Details regarding leachate recycling.
- Presence of the nearby Special Area of Consercation (SAC) site and pollution mitigation measures during the construction and operational phases.
- Lighting to be designed and oriented so as to prevent excessive light spill onto the estuary.
- Nutrient content and final use of composted material.

These points have been addressed in Chapters 3 and 5 of the EIS.

2.6.2.5 National Roads Authority

The National Roads Authority (NRA) advised that no new access should be provided to the national road network outside where a 50 kilometres per hour speed limit applies, in line with official policy. It also stated that where appropriate a Traffic and Transport Assessment (TTA) should be carried out in accordance with relevant guidelines and best practice, noting traffic volumes attending the site and traffic routes to and from the site with reference to impacts on the national road network and junctions of lower category roads with national roads. A TTA of the proposed development has been carried out by Michael Punch & Partners in conjunction with CST Group. The results are presented in Chapter 11 of this EIS.

2.6.2.6 Limerick/Clare/Kerry Regional Waste Management Office

The Limerick/Clare/Kerry Regional Waste Management Office (RWMO) suggested that a detailed breakdown of organic waste feedstocks be provided with the planning application, in order to ensure that the proposal complies with the targets set out in the National Strategy on Biodegradable Waste and therefore is in agreement with the policies and objectives of the current Replacement Waste Management Plan for the Limerick/Clare/Kerry Region 2006 – 2011.

3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Existing Site Features

The site of the proposed development is located within the Shannon Foynes Port Area, in the townland of Durnish, on the southern side of the Shannon Estuary, County Limerick. The port lies approximately 30 kilometres downstream of Limerick City. The proposed development site lies in the northeastern section of the Port Area and occupies 17.24 acres or 69,767.8 square metres. The topography of the site is flat.

The existing warehouse occupies 4,554.5 square metres (including two floors of office space). The proposed extension will measure 6,079.65 square metres. The proposed storage areas will measure 2,640.60 square metres. The overall site area occupies 3.424 hectares or 34,240 square metres.

The site of the proposed development currently comprises a vacant, L-shaped warehouse and external concrete surfaced yard. The proposed facility will be constructed within this warehouse and in an extension to the building, to be constructed within the external surfaced yard, as shown in Figure 3.1. The layout and elevations of the existing building are shown in Figure 3.2. The elevations of the proposed extension are shown in Figure 3.3. Office space and a reception area occupy the front of the warehouse. Ornamental shrubbery is planted around the warehouse entrance. The site is accessed via the internal roadway of the Shannon Foynes Port Area, which is in turn accessed from two separate security-controlled junctions with the N69 Limerick to Tralee National Secondary Route.

Greenport Environmental Ltd. submitted a planning application to Limerick County Council in August 2008 for a change of use of the existing onsite warehouse from a timber frame construction facility to an in-vessel composting facility and the removal of an open ended lean-to (Planning Reference No. 08/1633). The floor space occupied by the existing building measures 4,612 square metres, while that of the lean-to shed to be demolished measures 223.57 square metres. Planning permission for the change of use was granted to Greenport Environmental Ltd. in March 2009.

Land-uses on the sites adjacent to the proposed development site are primarily industrial and commercial, and include dusty coal/clinker storage (outdoors), engineering companies and other warehousing. The site to the west of the proposed development site is currently being developed for commercial fuel storage. The site to the north of the proposed development site is proposed to be developed by Atlantic Fuel Supply Company Ltd. for National Oil Storage Agency reserves. This development is still in the preliminary planning stages. The site to the east and southeast of the proposed development site, and adjacent to the Robertstown River, is owned by Irish Cement. This site has not been developed for industrial purposes to date. With regards to the wider landscape, agriculture is the dominant land-use within the Shannon estuary lowlands of Limerick and Clare.

3.2 Characteristics of the Proposed Development

3.2.1 Definitions

Greenport Environmental Ltd. proposes to construct a fully enclosed in-vessel composting and biogas facility, capable of treating up to 50,000 tonnes of organic waste per annum. The biological treatment of organic waste encompasses two types of microbiological processes: composting (aerobic) and biogasing (anaerobic).

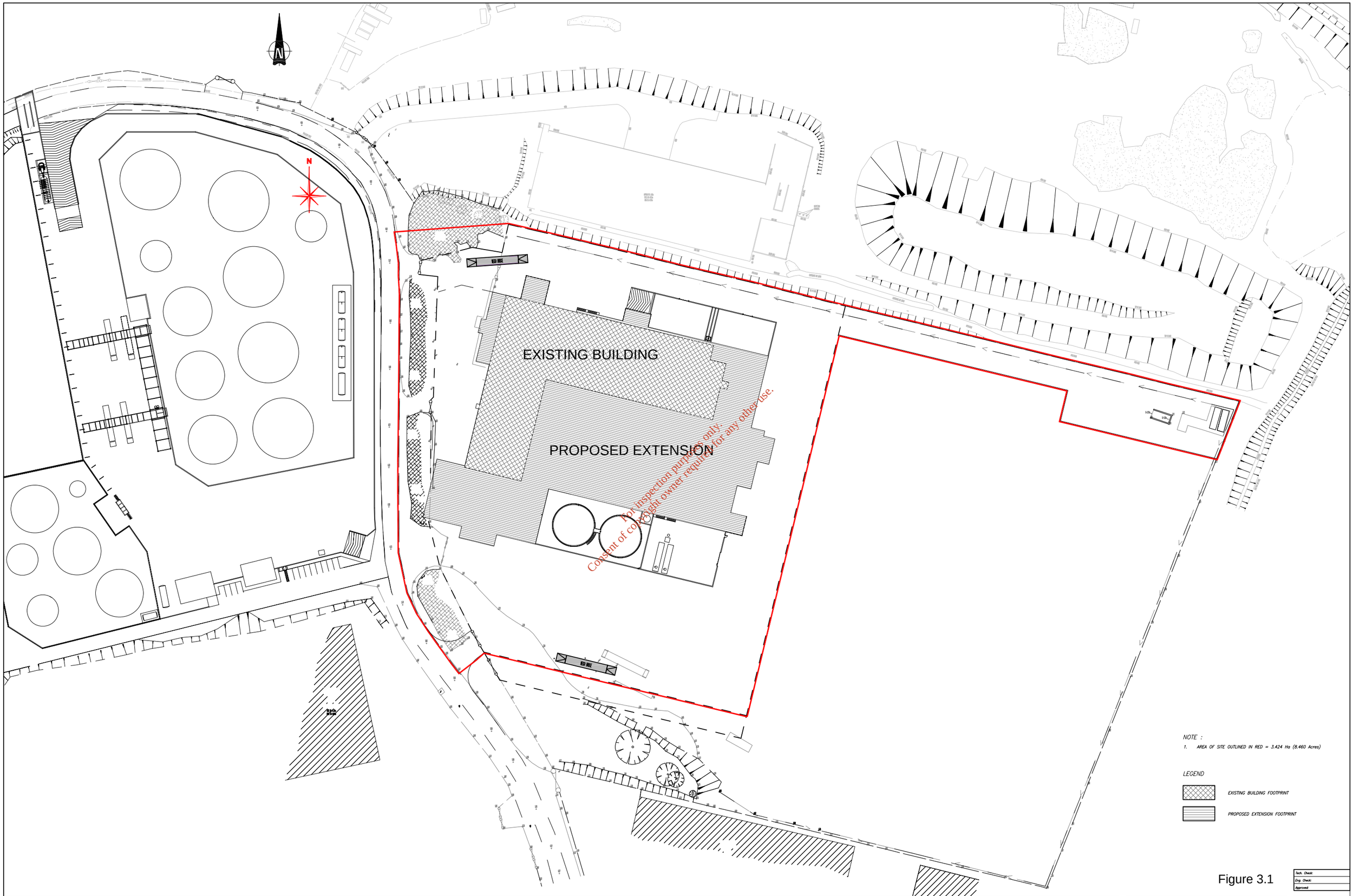


Figure 3.1

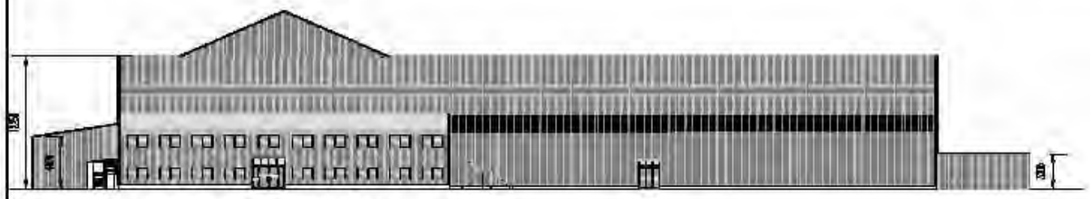
REV.	AMENDMENT	BY	DATE

Job: GREENPORT ENVIRONMENTAL COMPOSTING FACILITY FOYNES
Title: SITE LAYOUT

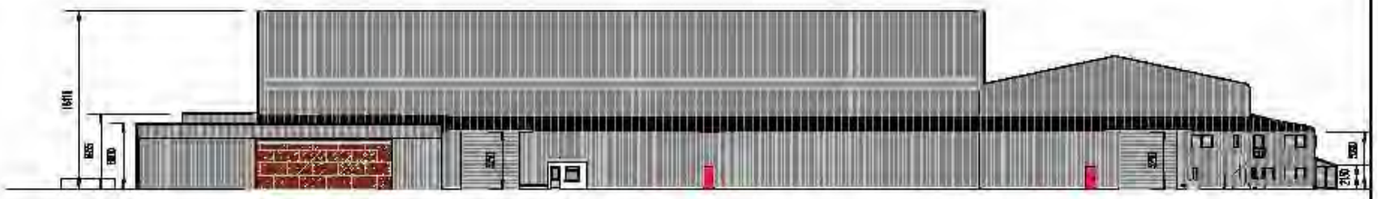
Michael Punch & Partners
CONSULTING ENGINEERS
• 97 Henry Street, Limerick, web: www.mpp.ie
T: 061 313 877, F: 061 319 071, E: limerick@mpp.ie
• 2nd Floor, Carnegie House, Library Road, Dun Laoghaire, Co. Dublin
T: +353 (0)1 230 3105, F: 01 230 3985, E: dublin@mpp.ie
• 1 University Technology Centre, Curraheen Road, Bishopstown, Cork.
T: 021 438 8100, F: 021 438 8101, E: cork@mpp.ie

Stage:	Planning
Scale @A0:	1:500
Drawn:	T.G.
Date:	2009-04-19
Drawing No:	061-306-101
Rev:	P0

Tech. Check:
Eng. Check:
Approved:

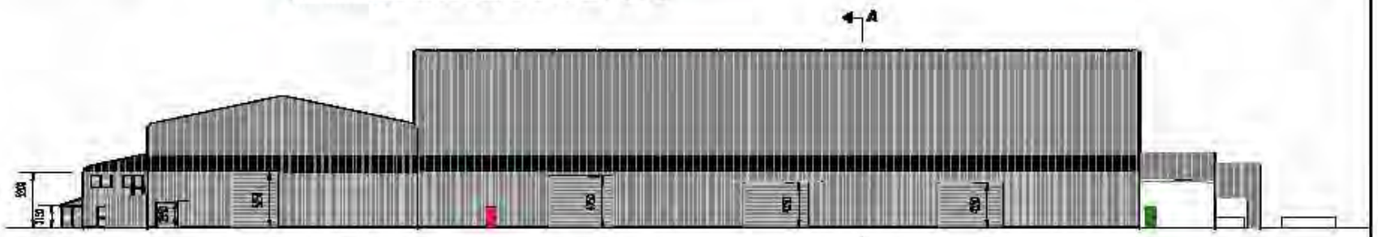


WEST/FRONT ELEVATION OF WAREHOUSE SCALE 1:100

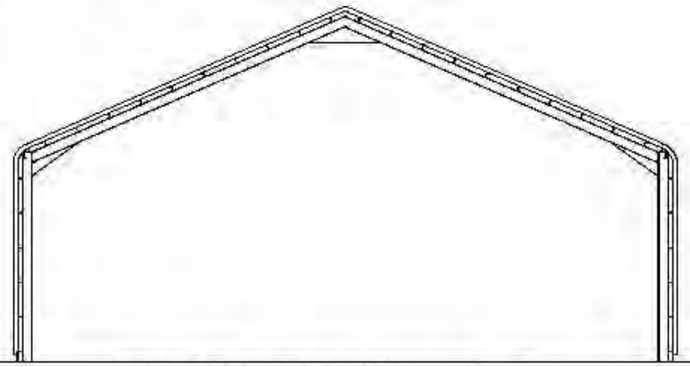


NORTHSIDE ELEVATION OF WAREHOUSE SCALE 1:100

EAST/REAR ELEVATION OF WAREHOUSE SCALE 1:100

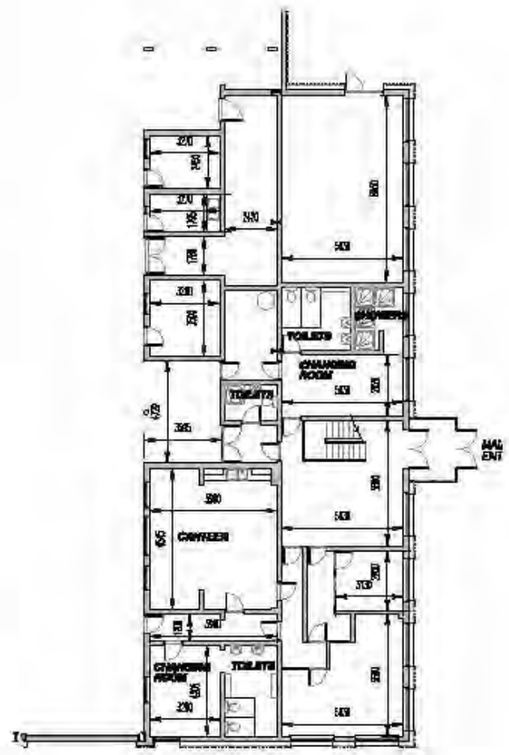


SOUTHSIDE ELEVATION OF WAREHOUSE SCALE 1:100

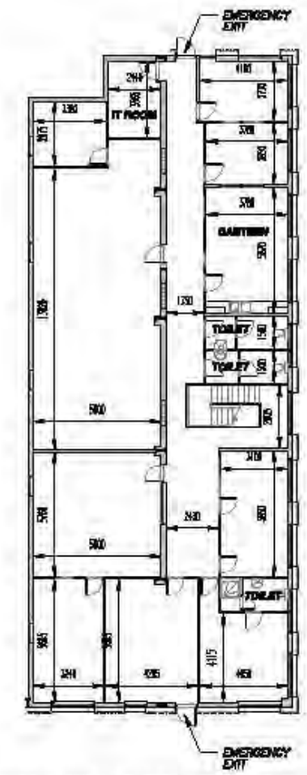


SECTION A-A TYPICAL SECTION OF WAREHOUSE SCALE 1:100

PLANS OF WAREHOUSE SCALE 1:200



DETAIL 1: GROUND FLOOR PLAN OFFICE BLOCK
SCALE 1:100



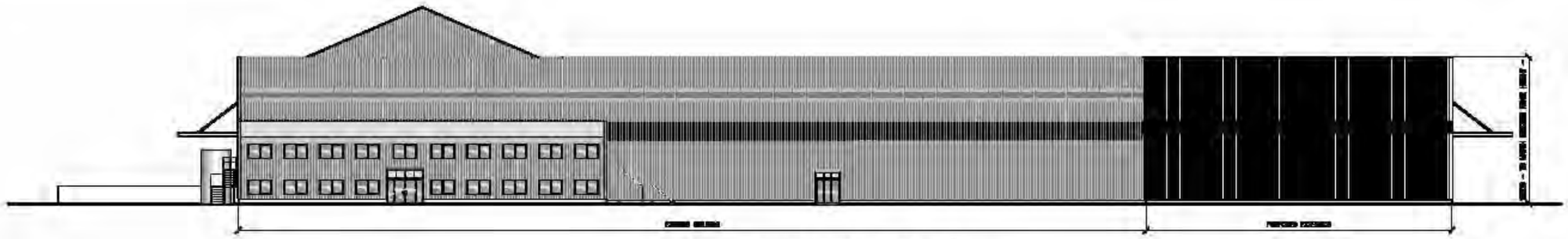
DETAIL 2: FIRST FLOOR PLAN OFFICE BLOCK
SCALE 1:100

Figure 3.2

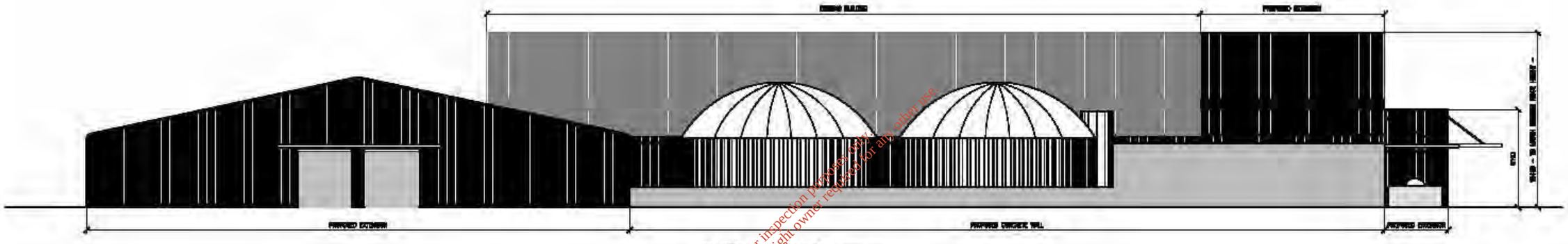
Michael Punch & Partners

CREDENHILL ENVIRONMENTAL COMPOSTING FACILITY FERMOY
PLAN & ELEVATIONS OF EXISTING BUILDING

081-306-122 P0



WEST/FRONT ELEVATION SCALE 1:200



SOUTHSIDE ELEVATION SCALE 1:200

Figure 3.3

BY	AMENDMENT	BY	DATE

Job: GREENFORT ENVIRONMENTAL COMPOSTING FACILITY FOYNES
Title: PROPOSED ELEVATIONS

Michael Punch & Partners
CONSULTING ENGINEERS

Stage: PRELIMINARY
Scale: AS SHOWN
Drawn: T.G.
Date: 03/04/13
Drawing No: 061-306-111
Rev: P01

The decomposition of organic material involves the mineralisation of organic compounds to carbon dioxide (CO_2) and water (H_2O) in the case of aerobic processes, and to methane (CH_4), carbon dioxide (CO_2) and water (H_2O) in the case of anaerobic processes. Composting is aerobic and therefore requires oxygen to proceed, while anaerobic digestion requires the absence of oxygen.

Aerobic and anaerobic processes produce different end-products and differ in energy yield. The main end-products of composting consist of a stabilised, odourless organic material (compost), carbon dioxide and water. The grade of the final product is dependent on the input material. During the composting process, oxygen supply can be achieved through passive diffusion but is more often actively supplied by forced or induced aeration. During the process, the energy stored in biomass is converted to heat. This heat production causes the evaporation of the water that is present in the biomass and produced during the composting process.

In-vessel composting, which will be utilised within the proposed facility, is defined as the composting of biomass in a closed reactor where the composting process is accelerated by controlled and optimised air exchange, water content and temperature control. A well-operated composting process can generate a dry compost process (60 to 70% dry solids).

Anaerobic digestion is defined as the biological decomposition of biowaste in the absence of oxygen and under controlled conditions in order to produce biogas and digestate. Biogas is typically composed of approximately 60% methane and 40% carbon dioxide. During anaerobic digestion the energy that is stored in the biomass is converted to methane. Methane can be harnessed for generation of energy that can be used elsewhere for electricity/heat generation. Anaerobic digestion is a net energy producing process. Very little heat is produced during this process, and therefore no evaporation of water takes place.

3.2.2 General Description of Proposed Development

The information presented in this chapter of the EIS is based primarily on that provided in the technical specification report produced for Greenport Environmental Ltd. by Waste Treatment Technologies (WTT). WTT is the Dutch company that has designed the proposed composting and biogas facility.

The design specifications set out in the WTT report and presented in this section of the EIS are based on an annual intake at the facility of 40,000 tonnes of biodegradable material. However, given the anticipated efficiency of the proposed facility, which will incorporate the use of the Best Available Technology (BAT), it is envisaged that the plant may be capable of processing up to 50,000 tonnes per annum of material. The incoming waste streams to be treated at the facility will comprise:

- Approximately 20,000 tonnes per annum of mechanically separated organic feedstock.
- Approximately 20,000 tonnes per annum of source-separated organic feedstock.

These quantities are estimates based on the successful rollout of source-separated brown bin collections to domestic and commercial customers in urban areas, in line with the *'National Strategy on Biodegradable Waste'*. In line with the strategy, the proposed facility is designed to handle both mechanically separated and source-separated organic waste. Each of the waste streams will be separately processed at all stages. As source-separated collection of organic feedstock increases, the quantity of mechanically separated feedstock is expected to decline. The facility will then dedicate more capacity to the separate treatment of the source-separated material.

WTT will be present for commissioning and during the first full process cycle (eight weeks) of the proposed composting and biogas facility, during which training will be given to all facility personnel. After this initial period, four more visits by WTT supervisors are foreseen for the following month in order to provide further instructions. Training on process techniques shall take place at the same time.

3.2.2.1 Overview of Proposed Process

The site layout map of the proposed facility is shown in Figure 3.4. This drawing also shows the ancillary infrastructure, including bunded water and gas storage, air abatement systems, and bunded fuel storage. The office, canteen, health and welfare facilities and laboratory will be located in the northwestern corner of the existing building.

A topview of the ground floor layout of the proposed facility is shown in Figure 3.5.

Incoming material will be delivered to the reception area within the facility. It will be thoroughly homogenised, and then transferred immediately into one of the processing tunnels. There will be no storage of incoming material onsite prior to its processing.

The feedstock will first be treated in a Dry Anaerobic Digestion tunnel system in order to produce electric energy. The material will be removed from the first stage vessel, mixed with a fraction of incoming fresh material and processed through the aerobic vessel composting and drying system. Retention time will be in the range of two to three weeks. The composted product will be treated into a refining system where three fractions shall be separated:

- Refined compost fraction (<12 millimetres in size). This fraction shall undergo hygienisation at 70°C for one hour in order to comply with the requirements of the Animal By-Products Regulations.
- Two-dimensional rejects, comprising mainly light plastics.
- Three-dimensional rejects.

As it is proposed that the facility will be handling two different grades of material (organic fines and source-segregated household and commercial organic material), two grades of end-product material will be produced: Class 1 compost produced from the source-separated material to be marketed as garden compost, and Class 3 compost (stabilised biowaste) to be used as landfill cover or as land remediation material. The two and three-dimensional rejects will be processed offsite.

3.2.3 Sources of Incoming Material

Incoming waste will be sourced from the Mr. Binman Ltd. waste transfer station and recycling centre in Luddenmore, Grange, County Limerick. This facility is located approximately 38 kilometres southwest of the proposed development site. Mr. Binman Ltd. is one of the largest independent waste recovery operators in the country, and collects non-hazardous household, commercial and construction and demolition waste from approximately 60,000 customers in the Mid-West and South-East Regions. The majority of the waste collected by Mr. Binman Ltd. is brought to the transfer station at Luddenmore for sorting and the recovery of recyclable materials.

The majority of the mixed municipal waste entering the Mr. Binman Ltd. facility at Luddenmore is processed through the Mechanical Biological Treatment (MBT) plant, which uses a combination of mechanical and manual processing to separate the waste into organic fines, refuse-derived fuel, ferrous metals, non-ferrous metals and residual waste for further recycling, recovery or disposal. Picking Station 1 of the MBT plant is used to segregate dry recyclable materials into specific fractions including glass, plastic,

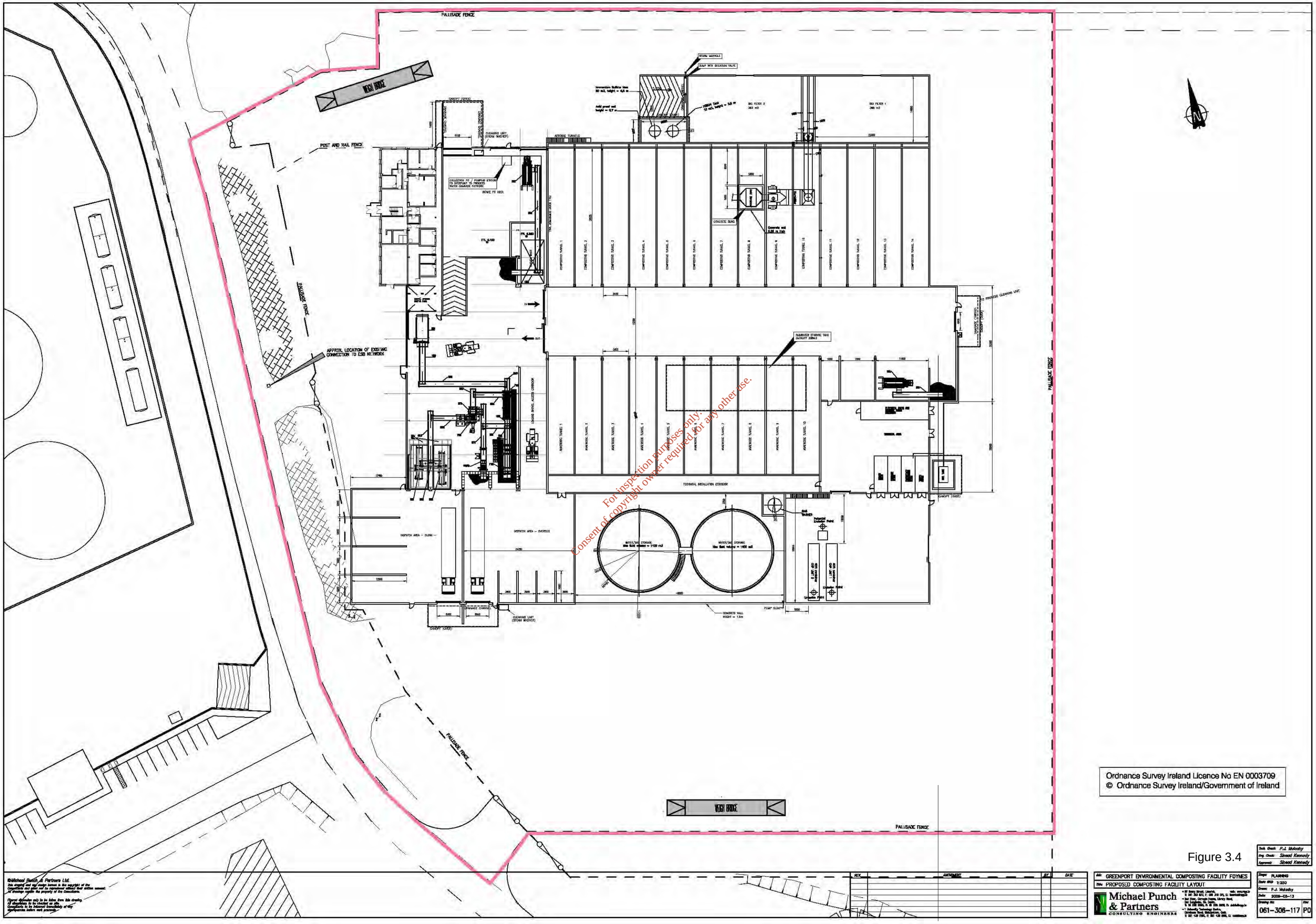


Figure 3.4

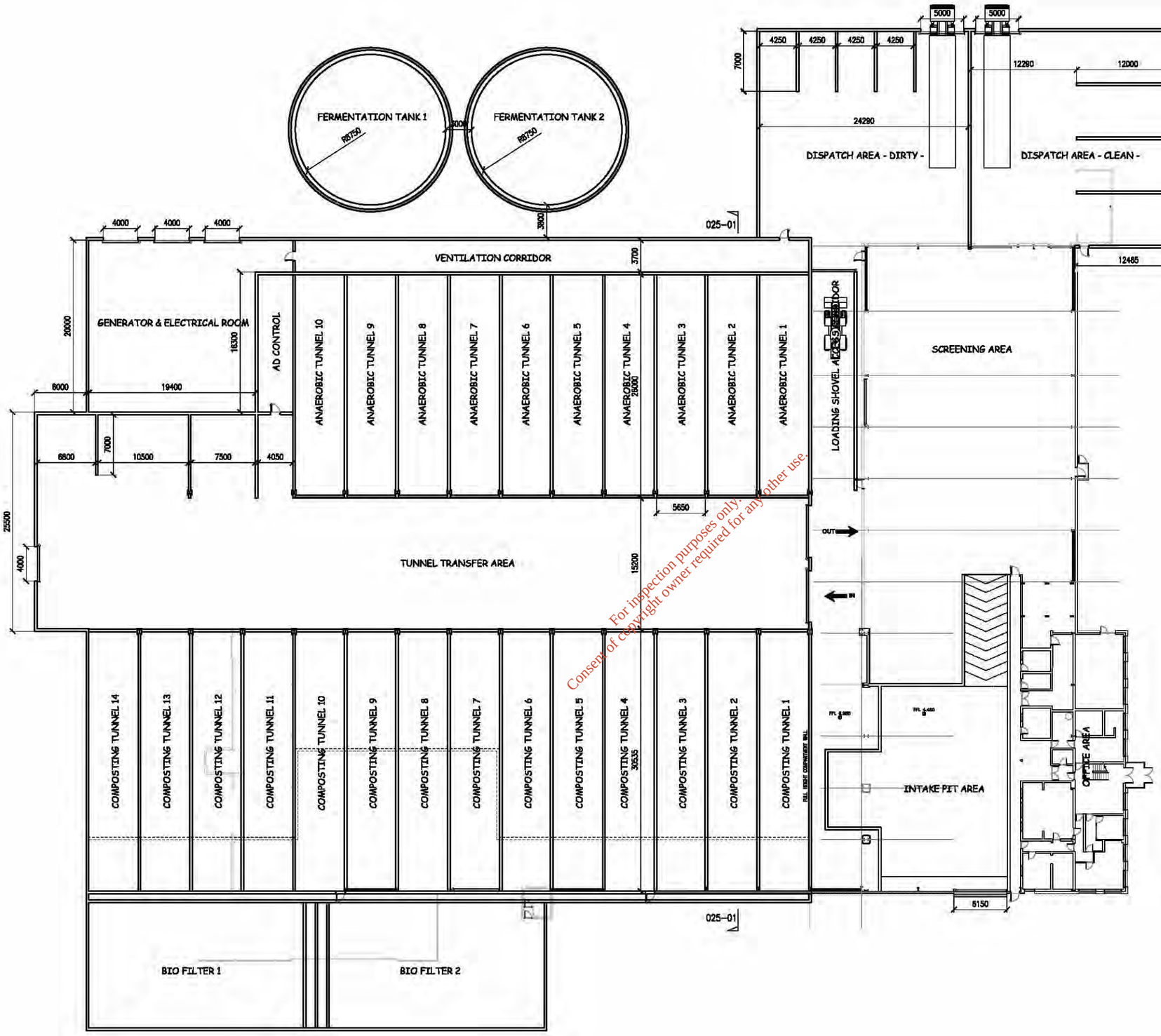


Figure 3.5

REV.	AMENDMENT	BY	DATE

Tech. Check:
Eng. Check:
Approved:

Job: COMPOSTING FACILITY FOYNES
Title: OVERALL GROUND FLOOR LAYOUT

Michael Punch & Partners
CONSULTING ENGINEERS
• 87 Henry Street, Limerick, Ireland. web: www.mpp.ie
T: +353 (0)61 313 877, F: +353 (0)61 316 071, E: limerick@mpp.ie
• 2nd Floor, Carnegie House, Library Road,
T: +353 (01) 230 2880, F: +353 (01) 230 2899, E: dublin@mpp.ie
• 1 University Technology Centre,

Stage: PRELIMINARY
Scale @A1: 1:250
Drawn: T.C.
Date: 07/01/09
Drawing No: Rev:

cardboard, newspaper, ferrous metal and aluminium cans. The remaining residual waste material is then conveyed onwards to Process 2 of the MBT plant for further recovery. Following pre-sorting, the residual municipal solid waste (MSW) passes through a 20-metre long trommel (cylindrical rotating screen). The trommel is divided into two sections. The first section has 60-millimetre (mm) screens, which remove most of the organic rich fraction. This section of the trommel is fitted with knives, which ensures all waste is removed from bin bags to enable treatment. Waste measuring less than 60 mm in size is primarily the organic rich fraction of the residual MSW and is suitable for composting or energy recovery in a plant off-site. At present, due to the lack of composting facilities in the region, the majority of organic fines extracted at this stage of the process are stored temporarily onsite at the Luddenmore facility prior to being sent to landfill.

Under Waste Licence No. W0061-02 issued by the Environmental Protection Agency (EPA), Mr. Binman Ltd. is currently permitted to accept 87,500 tonnes up to 105,000 tonnes of waste per annum at the Luddenmore facility. Mr. Binman Ltd. proposes to gradually increase this capacity to 200,000 tonnes per annum by 2012, subject to approval from the EPA. In September 2007, the EPA confirmed that the most appropriate way of increasing the annual waste acceptance limit beyond 105,000 tonnes was through a review of the facility's existing waste licence. Mr. Binman Ltd. submitted the application for a review of the waste licence to the EPA in July 2008. An Environmental Impact Assessment (EIA) of the proposed increase in tonnages to be accepted at the facility was carried out by McCarthy Keville O'Sullivan Ltd. on behalf of Mr. Binman Ltd., and the Environmental Impact Statement (EIS) was submitted to the EPA in January 2009.

3.2.4 Design Parameters

The WTT technical specification report for the proposed composting and biogas facility sets out the design parameters for the development, based on an annual intake of 40,000 tonnes of biodegradable waste. The information in Table 3.1 presents the yearly quantities of each waste fraction to be accepted at the facility, and the dry matter and organic dry matter content of each. Given the expected efficiency of the proposed facility however, it is anticipated that the plant will be capable of treating up to 50,000 tonnes per annum of organic waste.

Table 3.1 Waste Input and Characteristics

Fraction	Quantity	Dry Matter Content	Organic Dry Matter Content
Mechanically separated organic feedstock	Approx. 20,000 tonnes per annum	44%	55%
Source-separated organic feedstock	Approx. 20,000 tonnes per annum	35%	75%

The actual quantities presented in Table 3.1 may vary due to phased implementation and collection rates of source separated organic waste.

The composting process will continue 24 hours per day, 365 days per year, but material will only be accepted at the facility during the hours of 7:30am – 6:00pm, six days a week.

The materials flow diagrams presented in Figures 3.6 and 3.7 have been prepared by WTT and illustrate the stages of the proposed anaerobic digestion and composting process. Materials flow diagrams for two scenarios are presented for demonstrative purposes. The first scenario (A), presented in Figure 3.6, shows the treatment of 26,700 tonnes per annum of source separated brown bin waste and 13,300 tonnes per annum of organic fines from MSW. The second scenario (B), as presented in Figure 3.7, shows the treatment of

Figure 3.6 **FLOW DIAGRAM AND MASS BALANCE - GREENPORT ENVIRONMENTAL AD+IVC - 2/3 BBW + 1/3 MSW**

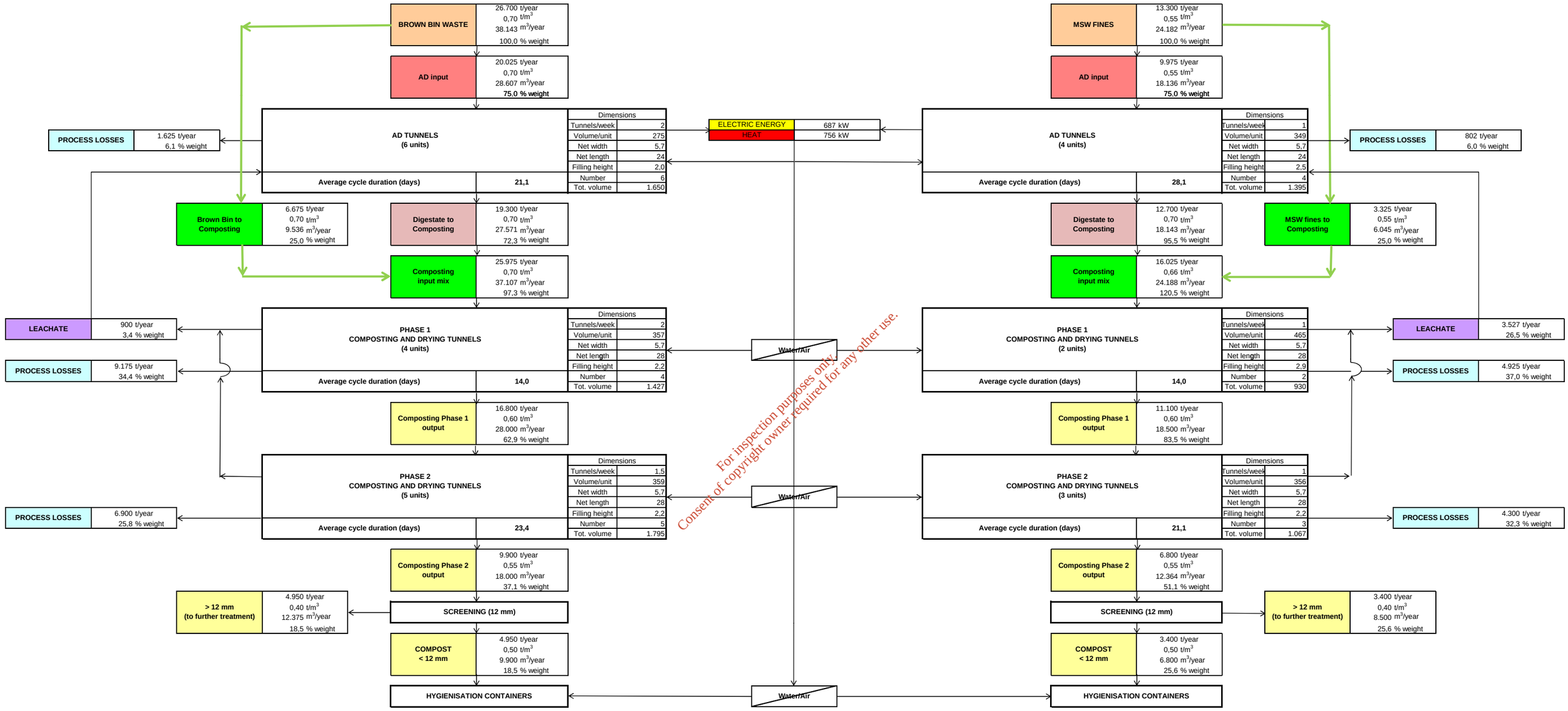
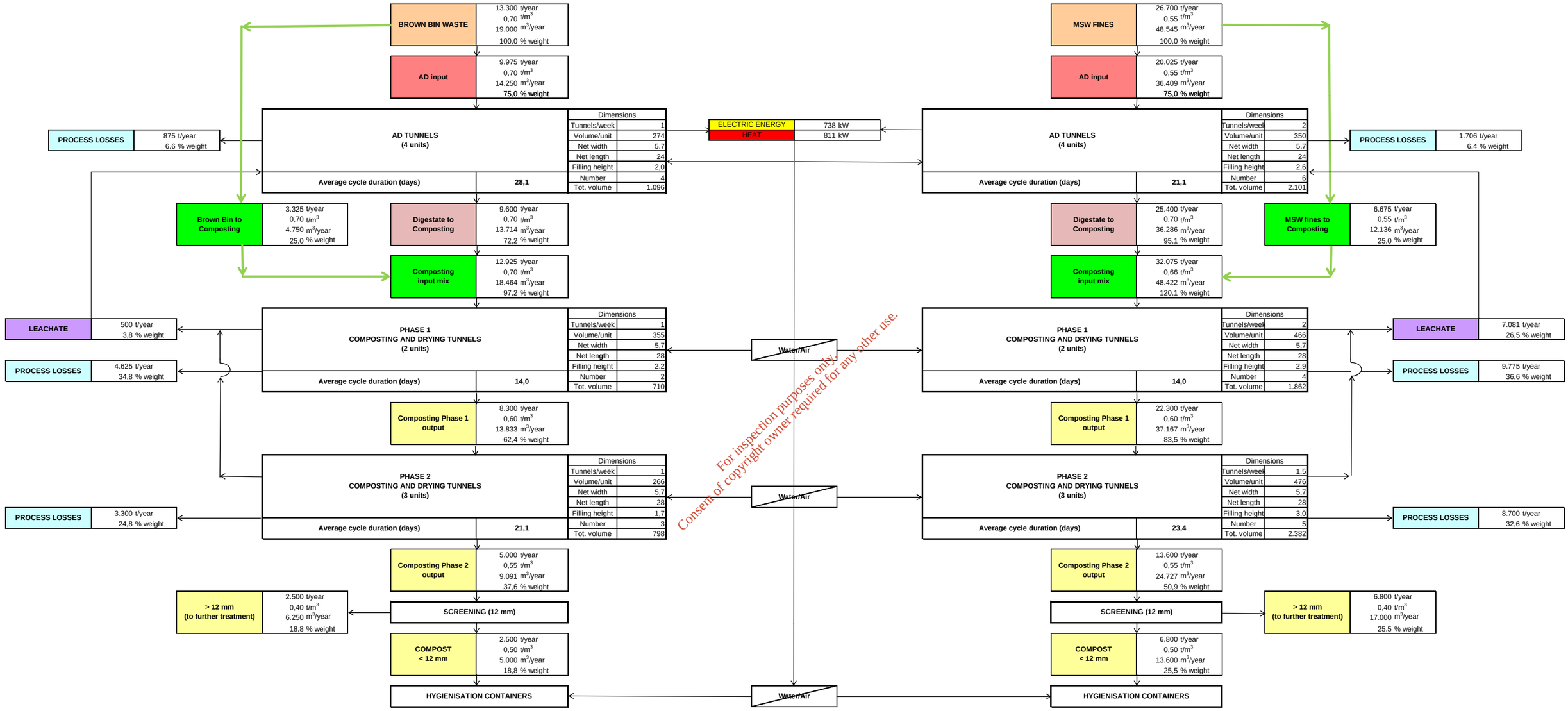


Figure 3.7 **FLOW DIAGRAM AND MASS BALANCE - GREENPORT ENVIRONMENTAL AD+IVC - 2/3 MSW + 1/3 BBW**



Flow diagram_MR BINMAN - 33% food - 67% fines.xls

13,300 tonnes per annum of source separated feedstock and 26,700 tonnes of mechanically-separated organic feedstock. These scenarios illustrate different possible feedstock rations but the actual quantities will vary due to phased implementation and collection rates of source separated organic waste.

The reported mass balances as calculated in the materials flow diagrams may vary depending on characteristics of the incoming waste, such as composition, moisture content, structure and bulk density.

Tables 3.2 and 3.3 present the tunnel quantity and dimensions for each waste type for Scenario A. Tables 3.4 and 3.5 present the tunnel quantity and dimensions for each waste type for Scenario B.

Table 3.2 Tunnels Quantity and Dimensions for Source-Separated Organic Feedstock (Scenario A – see Figure 3.6)

Parameter	Anaerobic Digestion	Phase I Composting and Drying	Phase II Composting and Drying
Total yearly input (tonnes per annum)	20,025 t	25,975 t	16,800 t
Total yearly input (cubic metres per annum)	28,607 m^3	37,107 m^3	18,000 m^3
Average cycle duration	21.1 days	14 days	23.4 days
No. of tunnels	6	4	5
No. of tunnels filled per week	2	2	1.5
Volume per unit	275 m^3	357 m^3	3539 m^3
Net width (metres)	5.7 m	5.7 m	5.7 m
Net length (metres)	24.0 m	28.0 m	28.0 m
Filling height (metres)	2.0 m	2.2 m	2.2 m
Total volume	1,650 m^3	1,427 m^3	1,795 m^3

Table 3.3 Tunnels Quantity and Dimensions for Mechanically Separated Organic Feedstock (Scenario A – see Figure 3.6)

Parameter	Anaerobic Digestion	Phase I Composting and Drying	Phase II Composting and Drying
Total yearly input (tonnes per annum)	9,975 t	16,025 t	11,100 t
Total yearly input (cubic metres per annum)	18,136 m^3	24,188 m^3	18,500 m^3
Average cycle duration	28.1 days	14 days	21.1 days
No. of tunnels	4	2	3
No. of tunnels filled per week	1	1	1
Volume per unit	349 m^3	465 m^3	356 m^3
Net width (metres)	5.7 m	5.7 m	5.7 m
Net length (metres)	24.0 m	28.0 m	28.0 m
Filling height (metres)	2.5 m	2.9 m	2.2 m
Total volume	1,395 m^3	930 m^3	1,067 m^3

Table 3.4 Tunnels Quantity and Dimensions Source-Separated Organic Feedstock (Scenario B – see Figure 3.7)

Parameter	Anaerobic Digestion	Phase I Composting and Drying	Phase II Composting and Drying
Total yearly input (tonnes per annum)	9,975 t	12,925 t	8,300 t
Total yearly input (cubic metres per annum)	14,250 m^3	18,464 m^3	13,833 m^3
Average cycle duration	28.1 days	14 days	21.1 days
No. of tunnels	4	2	3
No. of tunnels filled per week	1	1	1
Volume per unit	274 m^3	355 m^3	266 m^3
Net width (metres)	5.7 m	5.7 m	5.7 m
Net length (metres)	24.0 m	28.0 m	28.0 m
Filling height (metres)	2.0 m	2.2 m	1.7 m
Total volume	1,096 m^3	710 m^3	798 m^3

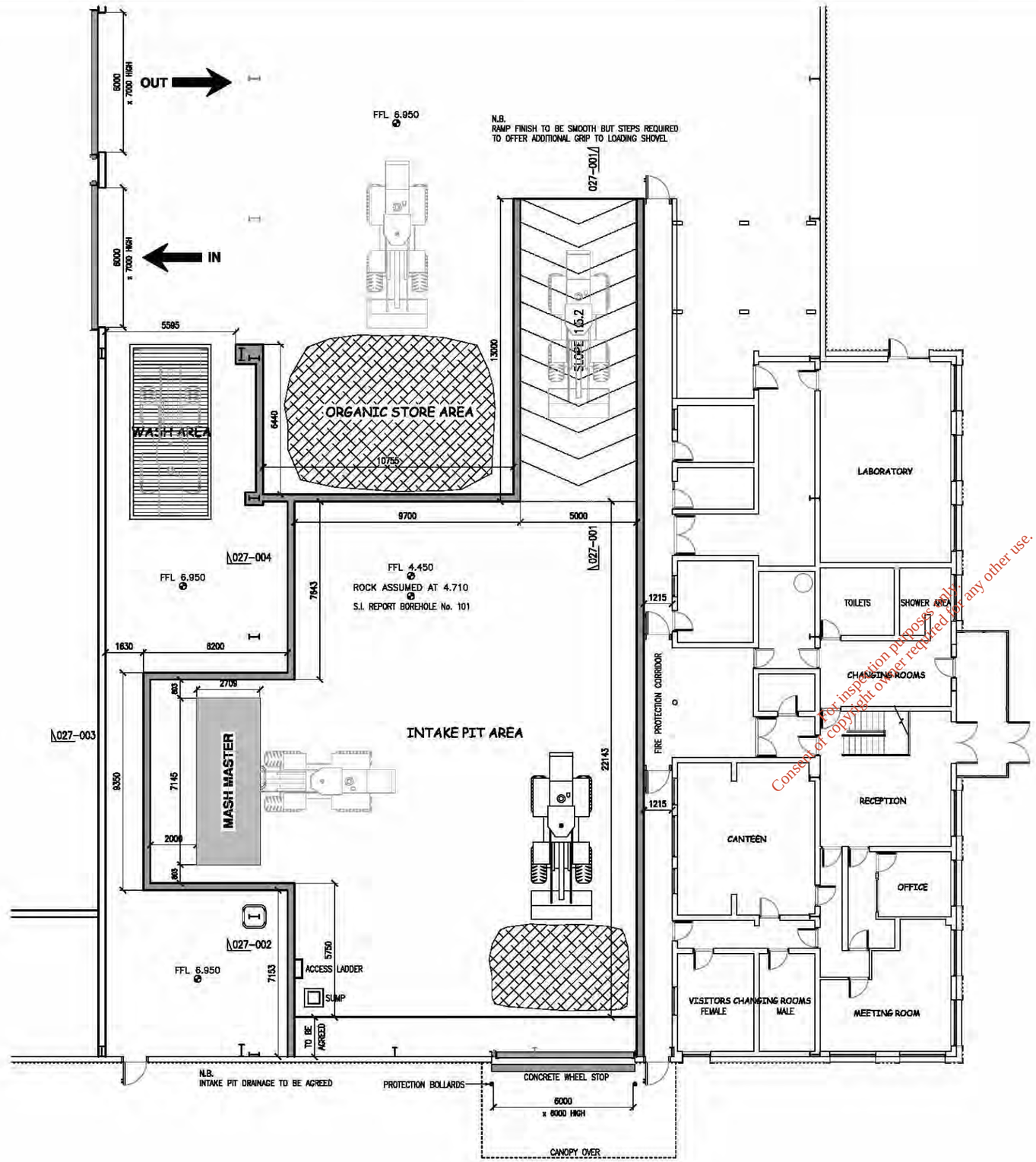
Table 3.5 Tunnels Quantity and Dimensions for Mechanically Separated Organic Feedstock – (Scenario B – see Figure 3.7)

Parameter	Anaerobic Digestion	Phase I Composting and Drying	Phase II Composting and Drying
Total yearly input (tonnes per annum)	20,025 t	32,075 t	22,300 t
Total yearly input (cubic metres per annum)	36,409 m^3	48,422 m^3	37,167 m^3
Average cycle duration	21.1 days	14 days	23.4 days
No. of tunnels	6	4	5
No. of tunnels filled per week	2	2	1.5
Volume per unit	350 m^3	466 m^3	476 m^3
Net width (metres)	5.7 m	5.7 m	5.7 m
Net length (metres)	24.0 m	28.0 m	28.0 m
Filling height (metres)	2.6 m	2.9 m	3.0 m
Total volume	2,101 m^3	1,862 m^3	2,382 m^3

3.2.5 Waste Reception and Preparation

After entering the facility gate, the feedstock delivery vehicles will be weighed, details recorded and then directed to the delivery area of the fully enclosed receiving building to unload the material. The delivery area is designed with a physical barrier between the tipping area and the truck unloading bay to prevent soiling of the truck wheels. The truck design ensures that the material is ejected into the reception area away from the unloading bay. A steam washing facility will be in place to clean the vehicle prior to leaving the building.

The layout of the intake area is shown in Figure 3.8.



INTAKE PIT AREA - PLAN -
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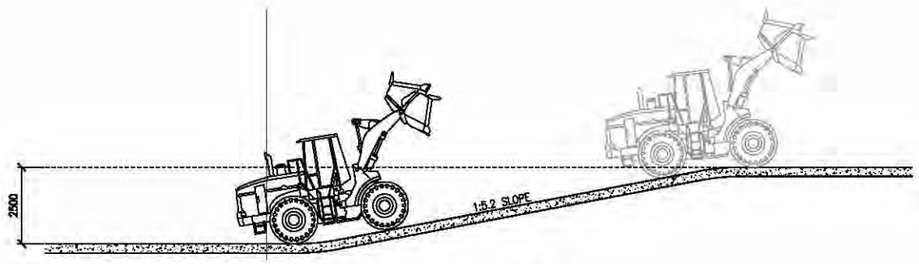
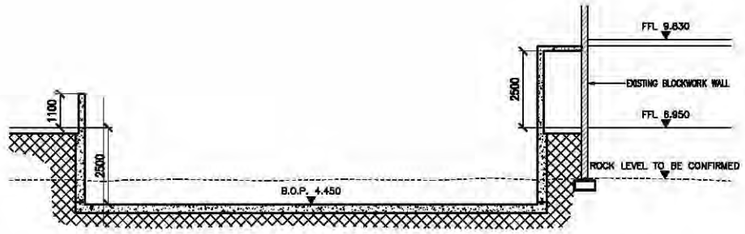


INTAKE PIT RAMP - SECTION 027-001 -
SCALE – 1:100



SECTION 027-002
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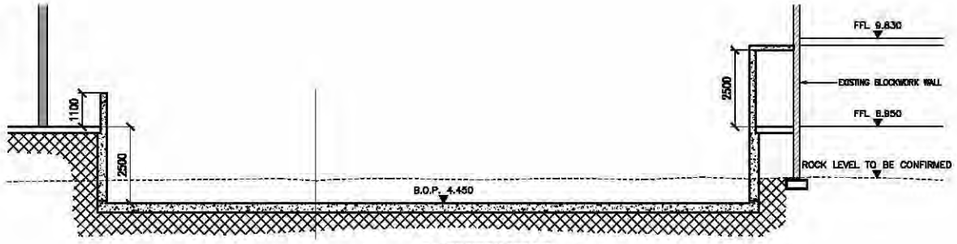

SECTION 027-003
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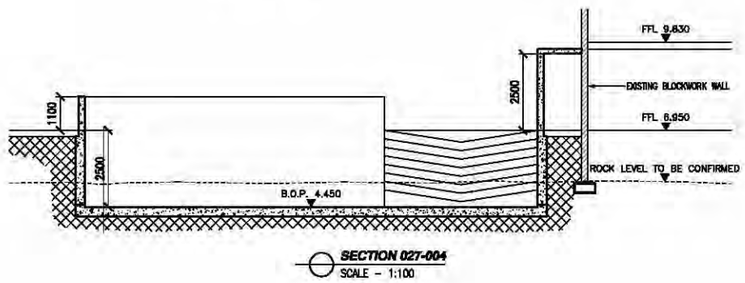


SECTION 027-004
SCALE – 1:100

Figure 3.8

REV.	AMENDMENT	BY	DATE

Job: GREENPORT ENVIRONMENTAL COMPOSTING FACILITY FOYNES
Title: INTAKE PIT AREA LAYOUT

Michael Punch & Partners
CONSULTING ENGINEERS
• 87 Henry Street, Limerick, Ireland. web: www.mpp.ie
T: +353 (0)61 313 577, F: +353 (0)61 318 071, E: limerick@mpp.ie
• 2nd Floor, Carnegie House, Library Road, Dun Laoghaire, Co. Dublin, Ireland.
T: +353 (0)1 230 2980, F: +353 (0)1 230 2999, E: dublin@mpp.ie
• 1 University Technology Centre, Curraheen Road, Bishopstown, Cork, Ireland.
T: +353 (0)21 438 6100, F: +353 (0)21 438 6101, E: cork@mpp.ie

Tech. Check:
Eng. Check:
Approved:

Stage: PRELIMINARY
Scale @A1: AS SHOWN
Drawn: T.C.
Date: 17/12/08
Drawing No: 061-306-114
Rev: P0

A wheel loader will retrieve the material from the reception area and feed it into the mixing unit in order to de-compact and homogenise the material prior to processing. From this unit, the material will be dropped into a concrete bunker, from which a wheel loader will collect it and transfer it to a designated Anaerobic Digestion (AD) tunnel.

A fraction of the material may be diverted to the composting process for mixing with similar material emerging from the AD tunnels, in order to provide supplementary biological energy and a less humid feedstock for the composting stage.

3.2.6 Anaerobic Digestion Tunnels

Each Anaerobic Digestion (AD) tunnel will consist of a sealed concrete structure equipped with a specifically designed door that is provided with a pressurised rubber seal. The concrete floor will house a series of parallel PVC pipes that are incorporated lengthwise into the floor. These pipes are provided with tapered plastic nozzles (spigots) and are connected via pneumatic valves to a high-pressure blower serving a series of tunnels. This will be used to blow air or re-circulate gas through the material during the different phases of the process.

The tunnels will also be equipped with a sprinkling system, which will re-circulate the water contained in the storage tanks. The sprinkling system will be used in the beginning of the process in order to activate the anaerobic process by inoculating the fresh material with the bacterial activity present in the water.

As soon as the material is fed to the AD tunnels and the door is closed, the high-pressure fan will start to re-circulate the tunnel air through the spigot floor. This will induce a preliminary aerobic process, which raises the temperature quickly to the mesophilic level required in the AD process. (Mesophilic temperatures typically range between 25 and 40º Celsius.) Furthermore the oxygen level in the air will be dropping, leading the process rapidly to anaerobic conditions.

The gas will be collected from each AD tunnel in the gas storage tank located on top of the wastewater tank, providing the suitable mixture for the generators.

When the anaerobic digestion process is complete, the tunnel will be purged with fresh air to the air abatement system, prior to opening the tunnel. The material will be retrieved from the AD tunnels with the wheel loader and transferred to the mixing section.

3.2.6.1 Electricity Generation

Methane gas generated in the AD tunnels will be stored in the headspace of the wastewater storage tanks. The gas will be pre-treated via a scrubber system/cooling loop prior to feeding into the CHP (combined heat and power) unit where the methane will be consumed to generate electricity. The gas will be converted to carbon dioxide and water prior to discharge. Fresh air will also be fed into the generator, producing an emission flow rate of 4,000 cubic metres per hour.

The composition of the gas from the AD tunnels entering CHP unit will be:

- Methane(CH_4): ~52%
- Carbon Dioxide(CO_2): ~47%
- Residual gases ~0.02%

The temperature range of the exhaust emission is anticipated to be between 170° - 400° Celcius, depending on the use of the heat back in the process. As the process will be using the heat continuously, the temperature will be continuously at the lower end of the

temperature range (i.e. 170 ° Celcius). In the event of failure of both the standby and duty generators, an automated system will ensure the emissions are oxidised prior to discharge, thereby ensuring there will be no emissions of environmental significance. This will be via a separate potential emission point. Further details regarding the design measures that will ensure there are no emissions of environmental significance from the proposed facility are presented in Chapter 8 of this EIS, Air and Climate.

3.2.7 Mixing

The material exiting the AD section will be de-compacted and mixed with the remaining fresh feedstock that has been diverted from the AD process to provide suitable material for the composting stage. This will be performed in a dedicated area equipped with another mixing unit. The digestate and the fresh feedstock will be fed to the machine in suitable proportions and then collected into a concrete bunker. From this bunker, the wheel loader will retrieve the material mixture and feed the composting/drying tunnels.

3.2.8 Composting and Drying

The composting process will take place in the aerobic tunnels, which will be virtually divided into two sets (Tunnel 1-7 and Tunnel 8-14). Each tunnel will be dedicated either to source separated waste to produce Grade 1 compost or to mechanically separated organic fines to produce a lower grade stabilised biowaste. The material will initially be fed to the first set of tunnels for Phase I intensive composting. This phase, also called high-rate phase or Active Composting Phase or Intensive Phase, is characterised by a rapid decomposition of the organic matter under optimum conditions of temperature, oxygen and moisture. The intense metabolic activity provides a high rate temperature increase in the material. The duration of this process will in the range of two to three weeks and the resulting product can be defined as freshly composted material.

After Phase I, the material will be unloaded from the tunnels and fed to the second series of tunnels for Phase II where the process is repeated. Depending on the material characteristics, during the transition between Phase I and Phase II, the material may need to be de-compacted in the mixing unit. Another intermediate de-compaction might be required within Phase II, depending on the process.

The composting tunnel will consist of a sealed concrete structure provided with a specially designed door, equipped with a seal. Each tunnel will have its own centrifugal fan that blows air via the air plenum through the composting material in a controlled manner, thereby providing optimum aerobic conditions within the vessel. Each tunnel will also be equipped with a sprinkling system that is used to balance the material moisture.

An advanced automated monitoring and control system under the control of the plant supervisor will continuously monitor and maintain temperature, oxygen and moisture at optimum conditions. The process will be maintained under negative air pressure within the tunnels. Negative pressure refers to a situation in which an enclosed area has a lower pressure than the area around it. The air from the tunnels will flow through a scrubber, humidifier and a biofilter system prior to leaving the system. The building will also be maintained under negative air pressure, and all air within the building will also flow through the humidifier and biofilter abatement system prior to discharge. The air extraction system is designed with sufficient air changes to protect employees.

Negative pressure will also be created in the buildings themselves to ensure odorous and polluted air is treated in this system without escaping uncontrolled from the plant. All air within the building will also flow through the humidifier and biofilter abatement system prior to discharge. The air extraction system is designed with sufficient air changes to protect employees.

3.2.9 Central Air System

The combination of abatement systems used in the design of the proposed facility is the best available technology for biogas/composting facilities.

3.2.9.1 Building Ventilation

Air will be continuously drawn from the facility buildings in order to keep them under negative pressure at all times. The air from these areas will generally be discharged using axial flow fans. The main entrance doors for the trucks will be equipped with an air curtain, to prevent odours leaving the building when the doors are opened. This system will only be activated when the doors are open.

3.2.9.2 Biofilter Fans

All air will flow through the input ductwork of the biofilter fans. The fans' capacity will be controlled by a frequency transformer based on the defined negative pressure level at the suction side of the biofilter fans. The negative pressure will be measured in the tunnels process air discharge ductwork. The two biofilter fans will be parallel and will blow the air through the air humidifier. A non-return valve will be installed behind the biofilter fans in order to allow the system to continue when one of the fans is out of operation.

3.2.9.3 Air Scrubber

The exhaust air exiting the tunnels will be conveyed initially to a scrubber to neutralise any basic gases prior to discharge to the humidifier. The scrubber will also reduce any dust and bioaerosols that may be present in the air. The scrubber will use sulphuric acid (H_2SO_4) as a reagent. This reagent will be dosed by a dosing pump, which is monitored continuously and controlled automatically. The water discharge will be automatically controlled by conductivity measurement whereas level sensors will control the water make-up in the scrubber. The scrubber and associated storage tanks will be bunded to 110% capacity and under cover to protect from rain ingress.

3.2.9.4 Air Humidifier

Before the collected exhaust air flows through the biofilter, it will be moistened with water using the air humidifier. A high air humidity level is essential for the correct operation of the biofilter. The air humidifier will consist of a chamber with spray nozzles. The air will flow through this chamber horizontally while the spray nozzles sprinkle the process water.

In the air humidifier, dust, bioaerosols and any water-soluble gases will be reduced from the air. After the air humidifying process, the air will flow to the biofilter. Electronic pressure recording instruments will be mounted before and after the air humidifier and send their measurement signals to the computer.

3.2.9.5 Biofilter

The biofilter consists of a concrete basin divided into different fields, according to size. The biofilter floor will consist of perforated concrete slabs supported by walls that allow the air to flow evenly under the complete field. The air will be blown into an air plenum, flow under the biofilter floor and from here through the biofilter media. The biofilter media will be selected in order to optimise purification capacities, life, limited pressure losses and a good moisture holding capacity. The selected biofilter material (e.g. woodchip/peat/artificial) will support environmentally friendly microorganisms that naturally purify the air passing through the biofilter, producing carbon dioxide, water and heat.

3.2.10 Wastewater and Condensate Collection and Treatment

3.2.10.1 Collection From AD Tunnels

Condensate and wastewater collected from the tunnels floor and from other drainage points will be collected and conveyed to the wastewater collecting sumps. Three sumps in total will be provided for liquid collection. The liquid will be held in the tanks for re-use within the process. Following treatment in the fermentation tanks to remove solids, the water will be re-circulated to the tunnels via a sprinkling system.

The drawings presented in Figures 3.9 and 3.10 show the water discharge system from the facility and the air/gas system, respectively.

3.2.10.2 Collection From Composting/Drying Tunnels

Condensate and wastewater collected from the tunnel floors and from other drainage points will be collected and conveyed to collection sumps. From here, a submersible pump will transfer the liquid to a rotating sieve where coarse particles can be separated from the stream and be re-circulated to the composting material or sent to the water holding tanks. All sumps will be equipped with level sensors and level switches. Fresh water collected from the roof will be used as make-up in the system, when needed.

3.2.10.3 Condensation in Central Air Treatment System

The biofilter fans, the humidifier, the scrubbers/coolers and the complete air suction ductwork will be provided with condensation/discharge connections. The water will be discharged to the collecting sumps.

3.2.11 Compost Refining and Hygienisation

Following maturation, the material will be fed by the wheel loader to the buffering and dosing hopper feeding the refining line. The hopper will dose the material on a conveyor belt, which will transfer it to a star screen. The screen will produce two size fractions:

- <12 millimetres (mm) (adjustable to 25 mm)
- >12 mm

The underscreened fraction will be transferred by belt conveyors to a de-stoner to separate the organic fraction from heavy materials like stones and glass. The heavy rejects will be conveyed to a concrete storage bunker whereas the composted material will be fed to the hygienisation cell. The latter will consist of two specifically designed contained cells, equipped with an air heating system that is capable of increasing the material temperature above the required 70°C for at least one hour in line with the Animals By-Products Regulations (see Section 3.2.14 of this chapter of the EIS).

The oversized material coming from the star screen will be conveyed to a ballistic separator, which further splits the material into different fractions to be held in a separate area for further treatment offsite.

The refining system will also be provided with a dedicated dust collection and filtering unit, which collects dust from the main sources (star screen, ballistic separator and destoner). The dust will be filtered by means of a pulse-jet fabric filter before conveying the flow to the main suction system heading to the biofilter. Any remaining dust will be removed by the humidifier before the air is treated by the biofilter.

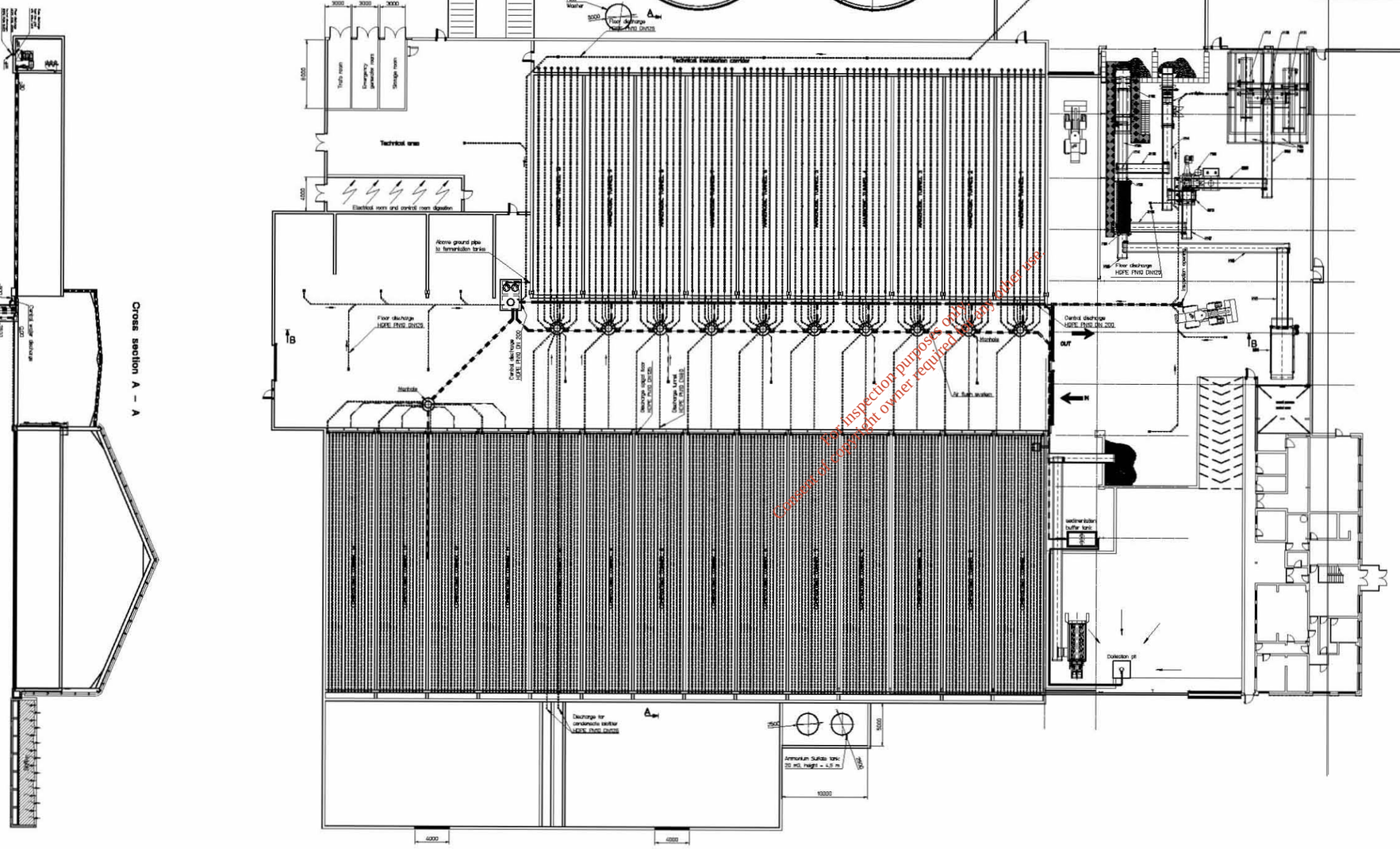


Figure 3.9

01	position generators	050209	TJN	02	Modification	040309	TE
Index	Modification	Date	Name	Index	Modification	Date	Name

WASTE TREATMENT TECHNOLOGIES
Bedrijvenpark Twente A12
7602 KM Almelo - Holland
Tel.: +3101546 581200
Fax.: +3101546 579000

Drawn by: 270109 H.V.
Checked by:

Name: Top view.
Underground water discharge system.
Tunnel installation.
Project Mr. Binnen

Scale: 1:1
Drawing No.: 35-5-2808230 0-02
Size: A0
Components No.:
Checked from:
35-5-
Sheet from: Sheet:

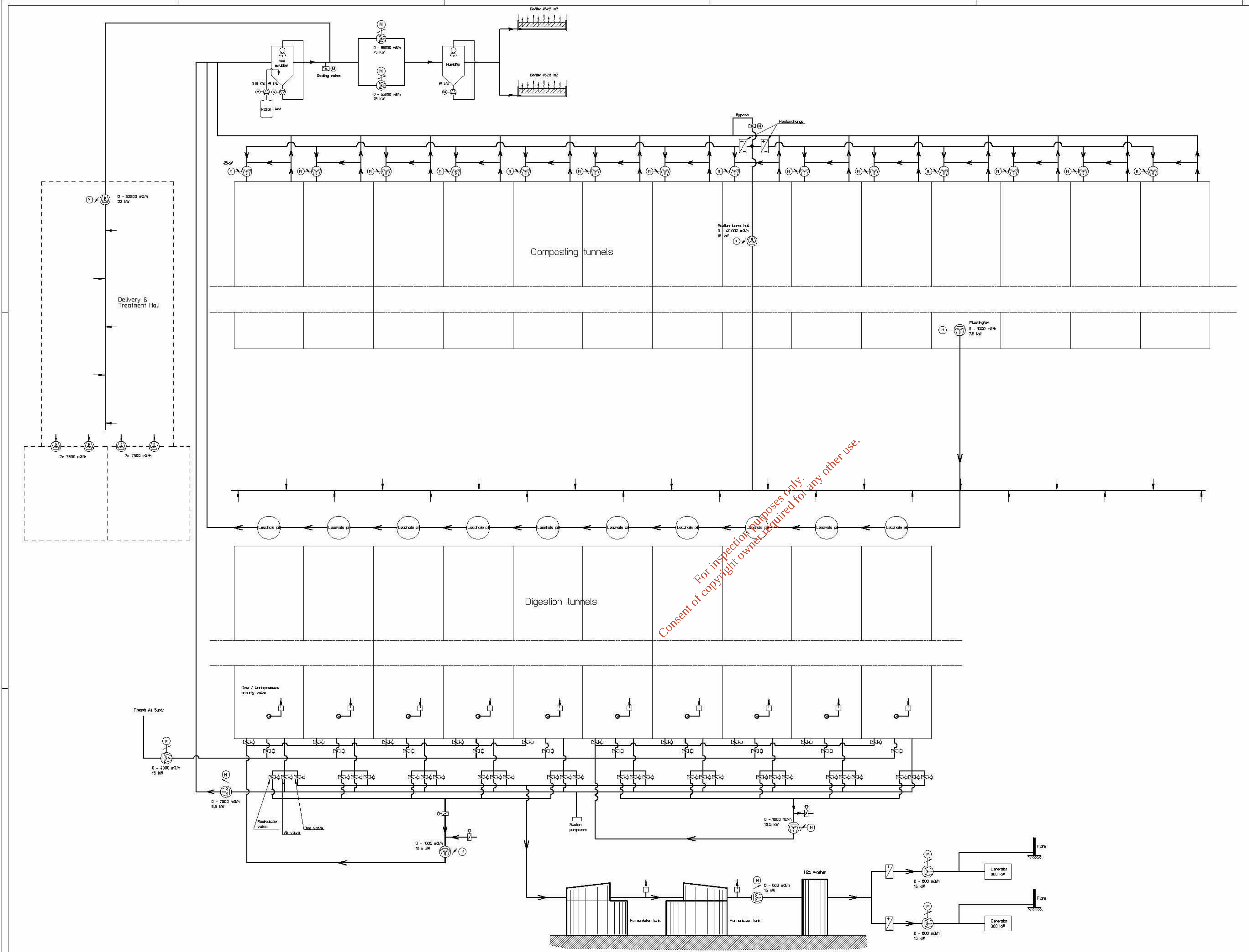


Figure 3.10

WASTE TREATMENT TECHNOLOGIES

Air/ Gas system

Mr. Binmon AD + IVC

The capacities of the refining and the hygienisation units have also been calculated based on the mass balance values in the materials flow diagrams. The capacities are shown in Tables 3.6 and 3.7.

Table 3.6 Refining Unit Capacity

Parameter	Measurement
Yearly input (from mass balance)	19,000 tonnes per annum (approx.)
Input required capacity	9 tonnes per hour
>12 mm line required capacity (from mass balance)	9,500 tonnes per year (approx.) (= 4.5 tonnes per hour)
<12 mm line required capacity (from mass balance)	9,500 tonnes per year (approx.) (= 4.5 tonnes per hour)

Table 3.7 Hygienisation Unit Capacity

Parameter	Measurement
Yearly input	9,500 tonnes per annum (= 9,500 m^3 per annum)
Input required capacity	9 m^3 per hour
No. of batches	2
Batch required volume	(9 x 7 / 2) = 31.5 m^3

Greenport Environmental Ltd. is conscious of the health and welfare of its employees and of the working and local community in the area where the proposed development will be sited. The proposed engineering controls and measures described in the EIS will ensure there is no impact of environmental significance from the facility. In addition, this development is designed to ensure a comprehensive control plan for bioaerosols, as described in *'Bioaerosols and Composting, a Literature Review'* by Cré, the Composting Association of Ireland in association with the Environmental Protection Agency, will be implemented in full.

3.2.12 Machine Technique

3.2.12.1 Mixers

The Komptech Mashmaster or equivalent will be used to homogenise incoming material. This machine will keep the material in an intensive mixing motion, thereby providing unravelling, shredding and homogenisation of the material. The specifications for the Komptech Mashmaster are provided in the Komptech product brochures provided in Appendix 2 of the EIS.

3.2.12.2 Refining Unit

The refining unit will consist of the buffering and dosing feeding hopper, star screen, ballistic separator, de-stoner, belt conveyors and de-dusting unit, as described below. The specifications for the component parts of the refining unit are also provided in the Komptech and HAMATEC product brochures in Appendix 2 of the EIS.

3.2.12.2.1 Buffering and Dosing Feeding Hopper

To allow for an even feeding of material to the compost refining line and provide an efficient lump crumbling action, a hopper and a chain conveyor will be used. This equipment will be of steel construction, strongly webbed and welded, with a separate cartridge that can be removed independently. The hopper will also be equipped with transversal dosing rollers.

3.2.12.2.2 Star Screen

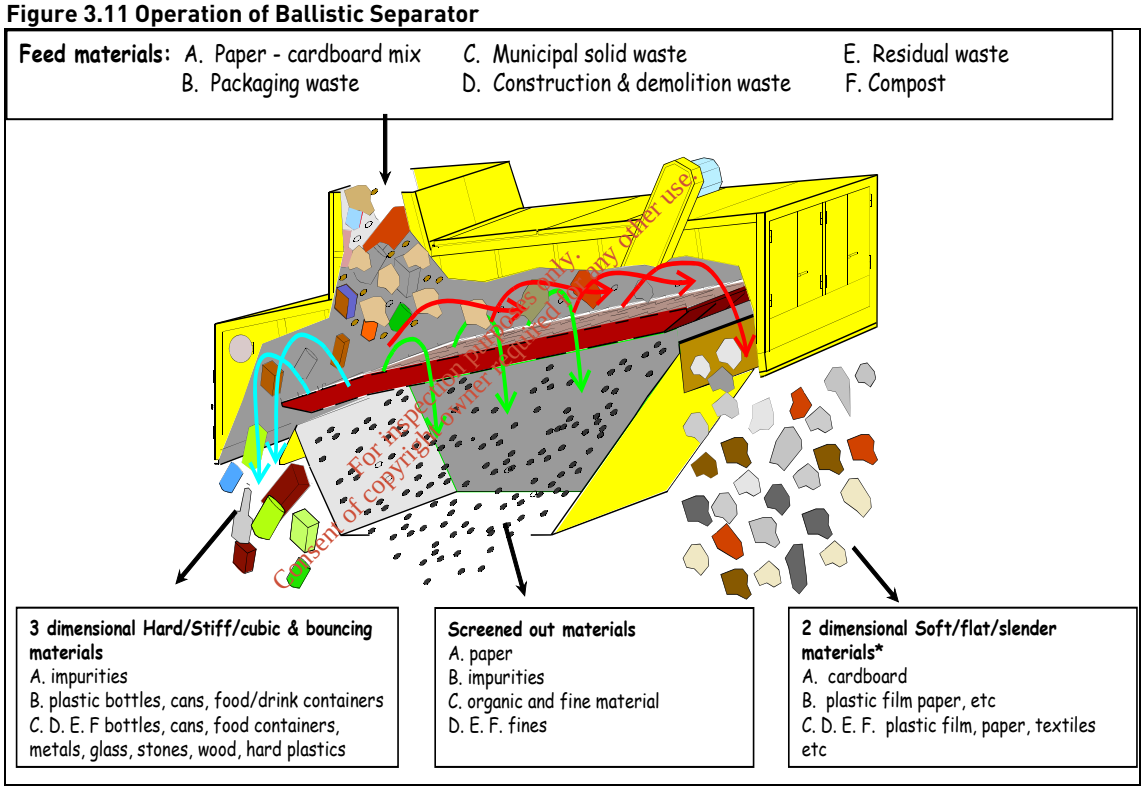
The Komptech Multistar 2-SE star screen technology, which will be utilised within the facility, is regarded as one of the most effective separation methods for organic waste. Features include precise separation selectivity irrespective of material moisture, and particle size change at the press of a button.

3.2.12.2.3 Ballistic Separator

The ballistic separator utilised at the facility will be a Komptech MK 41-3 or equivalent. Stones, glass and metal to a weight of up to ten kilograms each are accepted by this unit. The screening elements give the best turning motion of the material in order to free it from impurities and provide the best sorting of the mixed materials. The classifier is completely enclosed with connection for dust removal and is provided with large top and side doors for inspection and service.

An overview of the operation of the ballistic separator is shown in Figure 3.11.

Figure 3.11 Operation of Ballistic Separator



3.2.12.2.4 De-stoner and De-dusting Unit

The de-stoner type used at the proposed facility will be HAMATEC DK-S 30/12A or equivalent. The HAMATEC product brochure is included in Appendix 2 of the EIS.

3.2.13 Control System

3.2.13.1 PLC and Central Computers

The programmable logic control (PLC) system displayed on a computerised graphic interface system will provide the process controls for the entire process and ancillary equipment. On the screen, the supervisor will be able to see the status of the installation, and evaluate and adjust process parameters, if needed. The system will be equipped with modem and communication software for immediate support from the technology providers.

3.2.13.2 Control of Composting and Air Treatment Systems

The following parameters will be measured at each tunnel:

- Material temperature
- Inlet air temperature
- Outlet air temperature
- Inlet air volume
- Pressure underneath the compost

The following parameters will be controlled at each tunnel:

- Ventilator capacity
- Inlet air volume
- Inlet air in fresh or recirculation mode
- Valves for the tunnel water supply

The following biofilter parameters will be measured:

- Temperature before and after humidifier
- Pressure before and after humidifier

The following biofilter parameters will be controlled:

- Ventilator cap
- Inlet air temperature
- Control value of the hall and tunnel air

The following humidifier parameters will be measured:

- Water level
- Water electrical conductivity
- Pressure
- Temperature

The following humidifier parameters will be controlled:

- Water supply valve
- Water discharge valve

The following parameters will also be measured and displayed on the control system:

- Water level in the leachate water pits
- Water quantity used for the tunnel humidification system

3.2.13.3 Anaerobic Digestion System

The following parameters will be measured at each tunnel:

- Methane (CH_4) level
- Oxygen (O_2) level
- Hydrogen sulphide (H_2S) level
- Material temperature
- Air temperature

The following parameters are controlled at each tunnel:

- Valves for tunnel water supply

The following parameters will be measured in the central system:

- Methane (CH_4) level
- Oxygen (O_2) level
- Hydrogen sulphide (H_2S) level
- Gas volume
- Air volume
- Water temperature
- Pressures in air and gas ducts

The following parameters will be controlled in the central system:

- Gas fan capacity
- Air fan capacity
- Heating capacity
- Water level

3.2.14 End Product

The end product classification of the final composted material is provided in Appendix 3 of this EIS. Two grades of end product material will be produced. The higher grade compost (Class 1) produced from the source separated material will be marketed as compost, while the lower grade material will be suitable for use as landfill remediation or land remediation material.

Once approved, the final material will be removed from the site. No material will be stored long-term onsite.

3.2.15 Licencing and Regulation

3.2.15.1 EPA Waste Licence

The carrying out of waste disposal and recovery activities in Ireland requires authorisation in accordance with the Waste Management Acts, 1996 to 2008. Depending on the authorisation required, these activities are controlled either by the Environmental Protection Agency (EPA) or by Local Authorities within their own administrative areas. The principal legislative texts governing the form of authorisation required for waste facilities are:

- Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004)
- Waste Management (Facility Permit & Registration) Regulations 2007 (S.I. No. 821 of 2007, amended by S.I. No. 86 of 2008)

Where an applicant proposes the reception, storage and bio-treatment of more than 10,000 tonnes of biowaste per annum, or where more than 6,000 cubic metres of compost, digestate and biowaste are to be stored at any one time, a Waste Licence must be obtained from the Environmental Protection Agency (EPA). The EPA is the competent authority for granting and enforcing waste licences for specified waste activities listed in the third and fourth Schedule to the Waste Management Acts, 1996 to 2008. An application for a Waste Licence will be submitted to the EPA by Greenport Environmental Ltd. in 2009.

3.2.15.2 Animal By-Products Regulations

The *'National Strategy on Biodegradable Waste'* (2006) states that under the provisions of the European Communities (Animal By-Products) Regulations 2003 (S.I. No. 248 of 2003 as amended by S.I. 707 of 2005), compliance with national legislation requires composting and anaerobic digestion facilities which treat animal by-products to obtain veterinary approval from the Department of Agriculture, Fisheries and Food. This is in addition to the normal waste authorisation.

For proposed new composting or biogas facilities, the veterinary approval process is separated into two stages in order to provide applicants with a greater degree of certainty in the outcome. This first stage is a notification of intention to build a facility, which is designed to facilitate an *'approval in principle'* for the notifier that the proposed facility has the capacity to comply with veterinary legislation. The second stage is a formal application for approval when the facility is built and requires the applicant to demonstrate that the plant operates, upon commissioning, in accordance with:

- Specifications agreed during the first stage; and
- That correct procedures are in place at the plant to ensure that all material passing through the plant will be handled and treated in compliance with EU Regulation 1774/2002 laying down health rules concerning animal by-products not intended for human consumption.

Initial meetings have taken place between Greenport Environmental Ltd. and the Department of Agriculture, Fisheries and Food, and the design of the proposed facility has been approved in principle by the Department. The application for First Stage Approval is currently being prepared. However, evidence of First Stage Approval is not a pre-requisite for planning approval. First Stage Approval will be in place at the proposed facility prior to the commencement of any composting activity.

3.2.16 Site Access and Car Parking

The site of the proposed development is accessed via the internal roadways of the Shannon Foynes Port Area, which in turn accessed from two separate junctions with the N69 Limerick to Tralee National Secondary Route. The N69 runs from east to west approximately 630 metres south of the proposed development site, at its nearest point. Entry to the Port Area is restricted by automatic access barriers, which require security passes to open. Security passes are issued only to authorised persons by the Shannon Foynes Port Company.

Vehicles entering the site of the proposed development will use the easternmost junction of the Port Area with the N69. This junction is located approximately 830 metres south of the site, whereas the second junction is located approximately 1.16 kilometres west of the site.

A Traffic and Transport Assessment of the propose development has been carried out by CST Group in conjunction with Michael Punch & Partners. The results of this assessment are presented in Chapter 11 of the EIS. The general layout of the proposed facility takes into account the particularities of the site and optimises traffic management within the site. Access around the different buildings for operational and/or maintenance works shall be unrestricted. Staff car parking facilities are available in front of the existing warehouse.

The trailers to be used to deliver material to the site are specialised delivery units with rams that push out the waste well beyond the wheels, as opposed to tipping trailers. The delivery area within the building is designed to ensure contamination of wheels is avoided. A steam clean system for the cleaning of wheels will be available as back up. All loads

entering and leaving the facility will be covered, thereby preventing littering of the site. Regular inspections for litter on the approaching roads and within the facility will be carried out.

3.2.17 Hours of Operation

The hours of operation for the proposed facility will be 24 hours a day, 365 days a year. Material will only be accepted at the site during the hours of 7:30am to 6:00pm, six days a week.

3.2.18 Health and Safety

A site-specific Health and Safety Plan for the proposed composting facility is currently being prepared. All site staff will be made aware of and adhere to the company Health and Safety Plan. The policies of this Health & Safety Plan will have regard to those of the parent company of Greenport Environmental Ltd., Mr. Binman Ltd. The Health and Safety Statement of Mr. Binman Ltd. is included as Appendix 4 to this EIS. Only appropriately qualified and trained personnel will be permitted to operate machinery onsite.

3.2.19 Pest Control Plan

A Pest Control Plan for the site of the proposed development was prepared by Curtin Pest Control and submitted to Limerick County Council as part of the change of use Planning Application No. 08/1633. The Pest Control Plan has been included as Appendix 5 of this EIS.

The Pest Control Plan for the site will encompass monthly service visits, immediate response to emergency calls and the installation of approximately 24 large tamper-resistant rat bait boxes in the external areas of the site. Tamper-resistant mouse bait boxes will be installed in indoor areas. Curtin Pest Control operates to the Irish Pest Control Association's codes of practice.

3.3 Site Services

3.3.1 Water Supply

The existing water supply to the site is via the Foynes Harbour Water Supply Scheme. The fire water supply is taken from the Foynes Harbour Fire Supply.

The potable water supply is taken from the Limerick County Council Foynes water supply scheme, which is supplied from the Shannon Estuary Water Supply scheme whose source is the River Deel at Askeaton.

3.3.2 Surface Water Run-Off

The site drainage drawing in Figure 3.12, prepared by Michael Punch & Partners, shows surface water, storm water and foul sewer drainage from the site. Figure 3.13 shows the drainage construction details.

With regards to surface water run-off, external surface areas within the site will be limited to the perimeter of the building to allow access and egress for vehicles, thereby limiting the volume of run-off. Surface water run-off from external surfaced areas will discharge via a Class 1 hydrocarbon interceptor to the watercourse on the eastern boundary of the site. The Shannon Estuary will be the final receiving water for external surface water run-off from the site during the construction and operational phases of the development. Class-1 interceptors achieve a concentration of 5 mg/litre of oil under test conditions. The hydrocarbon interceptor will be installed at the start of the project to prevent any impacts

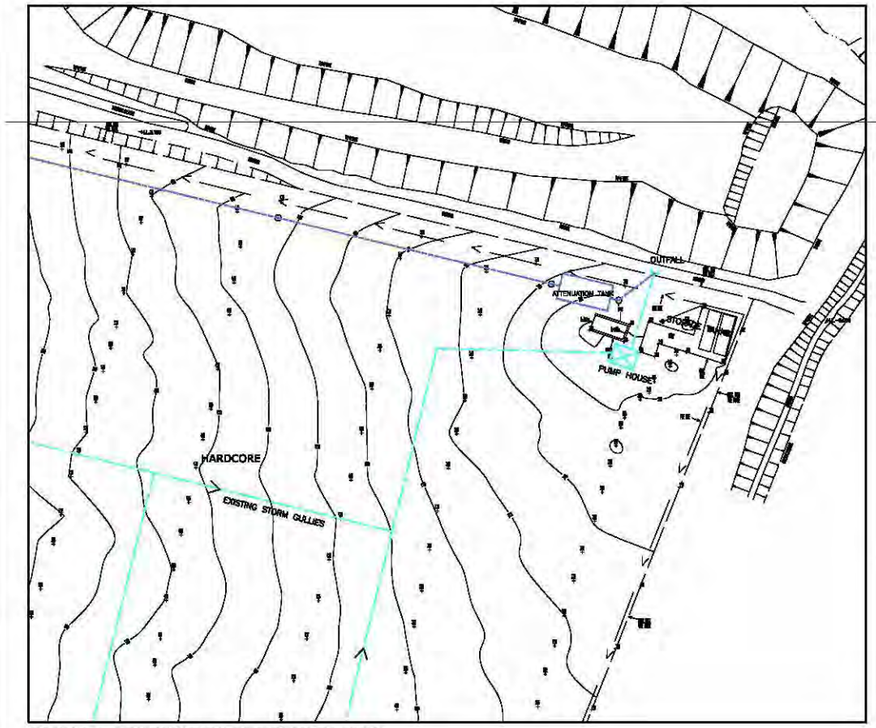
NOTE:
ALL SURVEY INFORMATION TAKEN FROM EMC SURVEYS, SURVEY OF SITE DEVELOPMENT FOYNES PORT. DWG NO. 04-062-001 DATED 12-07-04 ALL LEVELS SHOWN IN METRES RELATIVE TO STATION EMC3 - VALUE 6.83 METRES ORDNANCE DATUM MALIN HEAD.

LEGEND

- EXISTING STORM SEWER
- EXISTING FOUL SEWER
- PROPOSED STORM SEWER (S1-0)
- PROPOSED FOUL SEWER (F1-0)
- ROAD GULLEY
- MICRO DRAINAGE REFERENCE 54.000

PROPOSED FOUL

PN	LENGTH M	FALL M	SLOPE 1/X	DIA. MM	US IL M	DS IL M	US CL M	DS CL M
F1.000	41.00	1.800	24.0	225	5.425	3.625	6.530	5.030
F1.001	20.40	.450	45.30	225	3.625	3.175	5.030	4.580
F1.002	15.00	.090	166.70	225	3.175	3.085	4.580	4.490
F1.003	16.35	.059	237.30	225	3.085	3.016	4.490	4.460
F1.004	21.00	.090	232.20	225	3.016	2.926	4.460	4.460
F1.005	33.78	.151	224.10	225	2.926	2.775	4.450	4.180
F1.006	32.98	.400	82.40	225	2.775	2.375	4.180	3.780
F1.007	34.00	.142	239.30	225	2.375	2.233	3.780	3.680
F1.008	9.50	.047	244.90	225	2.233	2.186	3.680	3.680
F1.009	39.50	.188	235.20	225	2.186	2.018	3.680	3.430
F1.010	58.50	.250	234.20	225	2.018	1.768	3.430	3.180
F1.011	2.24	.028	80.0	225	1.768	1.740	3.180	3.180



DETAIL A - CONTINUATION OF DRAINAGE PLAN

PROPOSED OUTFALL
225mm ø FOUL SEWER
KLARGESTER NSB 8 BYPASS SEPERATOR
PROPOSED (EXTENDED) BUILDING
CONC YARD
HARDCORE
EXISTING STORM GULLIES
INDUSTRIAL UNIT

DETAIL A - CONTINUATION OF DRAINAGE PLAN

Figure 3.12

REV.	AMENDMENT	BY	DATE

Job: GREENPORT ENVIRONMENTAL COMPOSTING FACILITY FOYNES
Title: DRAINAGE LAYOUT

Michael Punch & Partners CONSULTING ENGINEERS

Stage: Planning
Scale @A0: 1:500
Drawn: P.J. Mulcahy
Date: 2006-04-28
Drawing No: 061-306-104 P0

Tech. Check: P.J. Mulcahy
Eng. Check: Sheed Kennedy
Approved: Sheed Kennedy

SEWER BEDDING DETAILS

TRENCH WIDTHS–RIGID PIPES

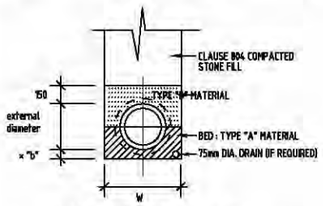
NOMINAL PIPE DIAMETER (mm)	100	150	225	300	375	450	525	600	750	900	1050	1200	1200
TRENCH WIDTH MIN (mm)	450	500	600	700	950	1050	1150	1250	1400	1950	2100	2300	2450
TRENCH WIDTH MAX (mm)	650	700	800	900	1150	1250	1350	1450	1600	2150	2300	2500	2650

TRENCH WIDTHS–FLEXIBLE PIPES

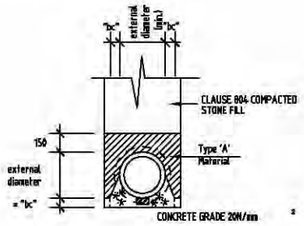
NOMINAL PIPE DIAMETER (mm)	100	150	200	250	300
TRENCH WIDTH MIN (mm)	450	450	600	600	700
TRENCH WIDTH MAX (mm)	600	600	700	700	850

DIMENSION–bc

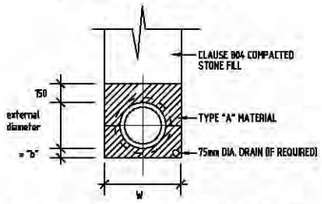
NOMINAL PIPE DIAMETER (mm)	100–450 incl.	525–600 incl.	750	900	1050	1200
bc (mm)	100	150	200	225	250	300



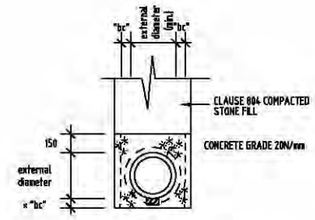
GRANULAR BEDDING kns
CLASS B : (fm = 1.9)



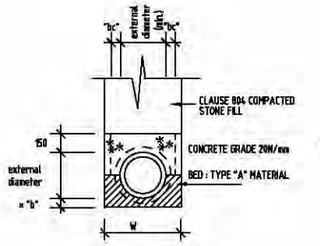
CONCRETE BED AND HAUNCH kns
CLASS A2 : (fm = 2.6)



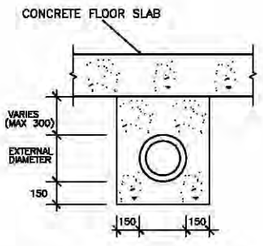
GRANULAR BEDDING AND SURROUND kns
CLASS S : (fm = 2.2)



CONCRETE BED AND SURROUND kns
CLASS Z



CONCRETE ARCH kns
CLASS A1 : (fm = 2.6)



CONCRETE BED UNDER FLOOR SLAB kns
CLASS E

= UNIFORM SOIL

"b" = 150mm FOR PIPES UP TO AND INCLUDING 600mm DIA.
"b" = 200mm FOR PIPES GREATER THAN 600mm DIA.

= ROCK

"b" = 200mm FOR PIPES UP TO AND INCLUDING 600mm DIA.
"b" = 300mm FOR PIPES GREATER THAN 600mm DIA

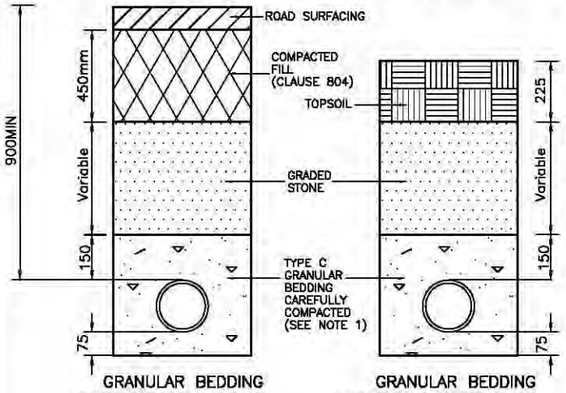
TYPE "A" MATERIAL :

BROKEN STONE OR GRAVEL, GRADING AS FOLLOWS:–
1) RIGID PIPES – PIPE DIAMETER UP TO AND INCLUDING 600mm
: SIEVE SIZE GREATER THAN 5mm AND LESS THAN 12mm
– PIPE DIAMETER GREATER THAN 600mm DIA
: SIEVE SIZE GREATER THAN 5mm AND LESS THAN 19mm
2) FLEXIBLE PIPES : SIEVE SIZE GREATER THAN 5mm AND LESS THAN 10mm

TYPE "B" MATERIAL :

SELECTED FILL UNIFORM READILY COMPACTABLE MATERIAL FREE FROM :
CLAY LUMPS RETAINED ON 75mm SIEVE, STONES RETAINED ON 25mm SIEVE,
TREE ROOTS, VEGETABLE MATTER,
BUILDING RUBBISH AND FROZEN SOIL.

WATERMAINS BEDDING AND VALVE/HYDRANT HOUSING

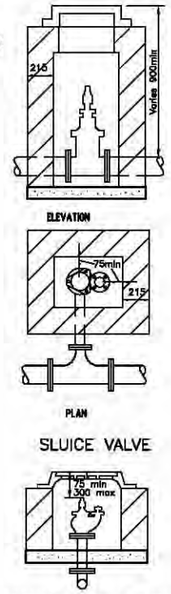


GRANULAR BEDDING
FOR FLEXIBLE PIPES LAID ALONG ROADS

GRANULAR BEDDING
FOR FLEXIBLE PIPES LAID THROUGH GRASSED AREAS

NOTES:

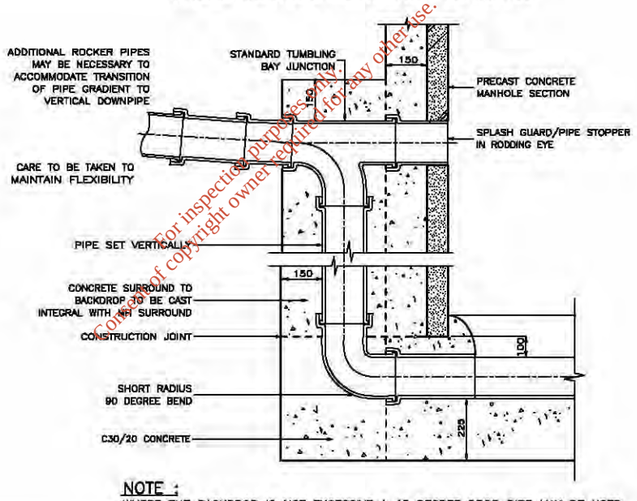
1. GRANULAR BEDDING TYPE C : shall consist of gravel graded from 9.5mm to 4.75mm, other granular materials may be used subject to approval
3. All pipes passing under foundations and floors shall be haunched.



SLUICE VALVE

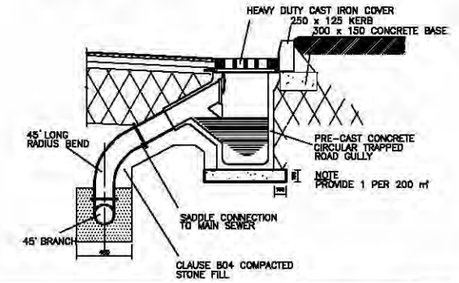
HYDRANT ON FOOTPATH

TYPICAL VERTICAL BACKDROP DETAIL n.t.s.

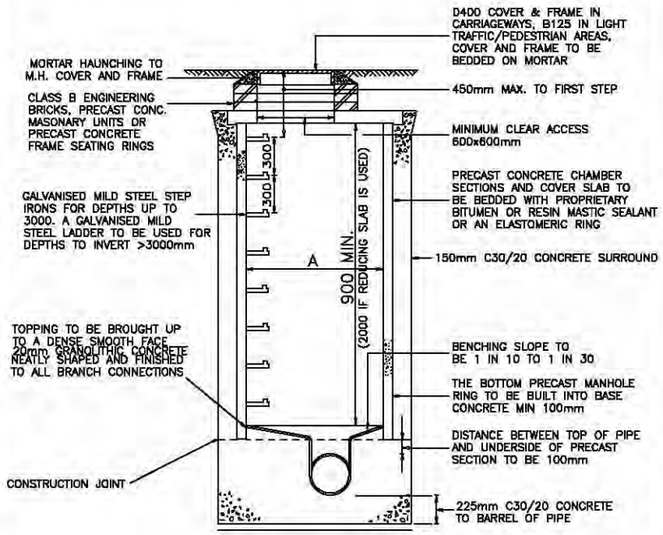


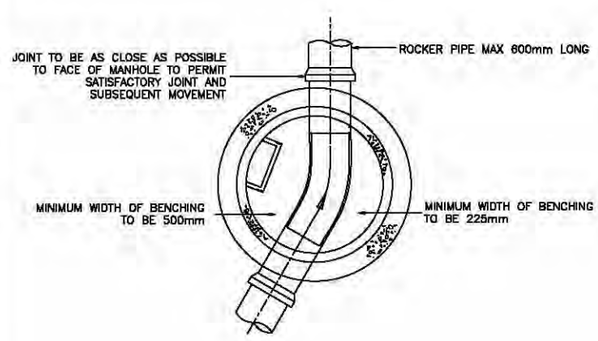
NOTE :
WHERE THE BACKDROP IS NOT EXCESSIVE A 45 DEGREE DROP PIPE MAY BE USED

TYPICAL SECTION THROUGH ROAD GULLY 1:10



TYPICAL MANHOLE DETAIL





NOTES :

1) MANHOLES WITH OUTGOING PIPES GREATER THAN 600mm DIA. SHOULD BE FITTED WITH GUARD BARS, SAFETY CHAINS OR OTHER SAFETY DEVICES.
2) ALL PRECAST CONCRETE RINGS TO BS5911 : PART 200.
3) FOR DEPTHS TO INVERT >2.700m AN ACCESS SHAFT OF MIN. 900mm DIAMETER AND REDUCING SLAB MAY BE USED.
4) WHERE THE DEPTH TO INVERT IS 1.00m OR LESS A 450mm x 450mm (OR 450mm DIA.) INSPECTION CHAMBER WITH MINIMUM COVER SIZES OF 450mm DIA. MAY BE USED SUBJECT TO ACCOMODATION OF CONNECTIONS AND APPROVAL OF THE LOCAL AUTHORITY.

DIAMETER OF PIPE IN MANHOLE (LARGEST, mm)	MINIMUM INTERNAL DIAMETER OF MANHOLE (mm) "A"
LESS THAN 375	1200 (1050 WHERE DEPTH TO SOFFIT IS 1.35–1.50m)
375 – 450	1350
450 – 750	1500
750 – 900	1800

Figure 3.13

Tech. Check:	P.J. Mulcahy
Eng. Check:	S. Kennedy
Approved:	S. Kennedy

REV.	AMENDMENT	BY	DATE

Job:	GREENPORT ENVIRONMENTAL COMPOSTING FACILITY FOYNES
Title:	DRAINAGE CONSTRUCTION DETAILS
Stage:	Planning
Scale @ A1:	As Shown
Drawn:	P.J. Mulcahy
Date:	2009-04-09
Drawing No:	061–306–110
Rev:	P0

Michael Punch & Partners
CONSULTING ENGINEERS
• 97 Henry Street, Limerick. T: 061 315 877, F: 061 318 071, E: limerick@mpp.ie, web: www.mpp.ie
• 2nd Floor, Carnegie House, Library Road, Dun Laoghaire, Co. Dublin. T: 01 235 2080, F: 01 235 2081, E: dublin@mpp.ie
• 1 University Technology Centre, Curraheen Road, Bishopstown, Cork. T: 021 438 8100, F: 021 438 8101, E: cork@mpp.ie

during the construction or the operational phase. During the construction phase all vehicles will be inspected for leaks prior to entering the site.

3.3.3 Foul Water Drainage

All process operations associated with the proposed composting and biogas facility will take place indoors on an impermeable surface. All process wastewater generated will be contained in bunded storage tanks and re-used within the process. There will therefore be no process discharges off-site to ground or surface water.

Toilets are available onsite within the existing warehouse building, from which wastewater currently discharges to an onsite septic tank. A suitably sized 'Puraflow' or equivalent mechanical treatment unit will be installed onsite to replace this septic tank. This upgrade will be completed at the beginning of the construction works to ensure there is no impact on emissions to the sewer during the construction phase. Emission limits for the discharge of treated effluent from the onsite wastewater treatment unit will be assigned by the EPA as part of the waste licensing process for the facility. The treated effluent will discharge to an existing sewer provided as part of the contract for an adjacent facility. Following discussions between Greenport Environmental Ltd. and the Shannon Foynes Port Authority, the connection from the onsite treatment unit will be made to this sewer, which is currently under construction on the Port Road. This sewer will be taking treated effluent from an adjacent site and the outfall to the estuary is currently under construction.

3.3.4 Electricity

The proposed development site is supplied by the ESB network. The site layout drawing shown previously in Figure 3.4 shows the point of connection to the electricity network.

The design, construction and installation of the electrical system equipment within the proposed facility will be in accordance with International Electro-technical Commission (IEC) regulations and shall comply to all applicable Community and national regulations, including:

- Low Voltage Directive (73/23/CEE and modifications).
- Electromagnetic Compatibility (89/336/CEE and modifications).
- Machine Directive (89/392/CEE and modifications).

The electrical distribution characteristics as set out in Table 3.8 are assumed.

Table 3.8 Electrical Distribution Characteristics

Parameter	Measurement
Distribution	400 Volts
Auxiliary distribution	230 Volts
Distribution system	TN-S
Frequency	50 Hz
Auxiliary voltages	Control circuits: 230 V ac (Volts alternating current)
Signals and PLCs	24 V dc (Volts direct current)

The electrical system will comprise the following switchboards:

- One main electric and automation switchboard for pre-treatment system.
- One main electric and automation switchboard for composting tunnels system.
- One main electrical and automation switchboard for anaerobic digestion system.
- One main electrical and automation switchboard for CHP units.

- One main electric and automation switchboard for refining system.
- One set of local control boxes.

3.3.5 Lighting

A lighting plan for the proposed development site has been prepared, and is shown in Figure 3.14. The lux levels on this drawing show that there will be no light spill outside the proposed development site.

3.4 Construction Works

3.4.1 Pre-Construction Works

Planning permission has been obtained by Greenport Environmental Ltd. from Limerick County Council for the change of use of the existing onsite warehouse from a timber frame construction facility to an in-vessel 10,000 tonne per annum composting facility and the removal of an open-ended lean-to (Planning Reference No. 08/1633). In the Further Information submitted to the Planning Authority in December 2008 by Michael Punch & Partners on behalf of the applicant, details were provided regarding the demolition of the lean-to structure, as shown in Table 3.9. The demolition of this structure will take place prior to the construction of the proposed composting facility. All materials will be retained on site for future internal building works and repairs.

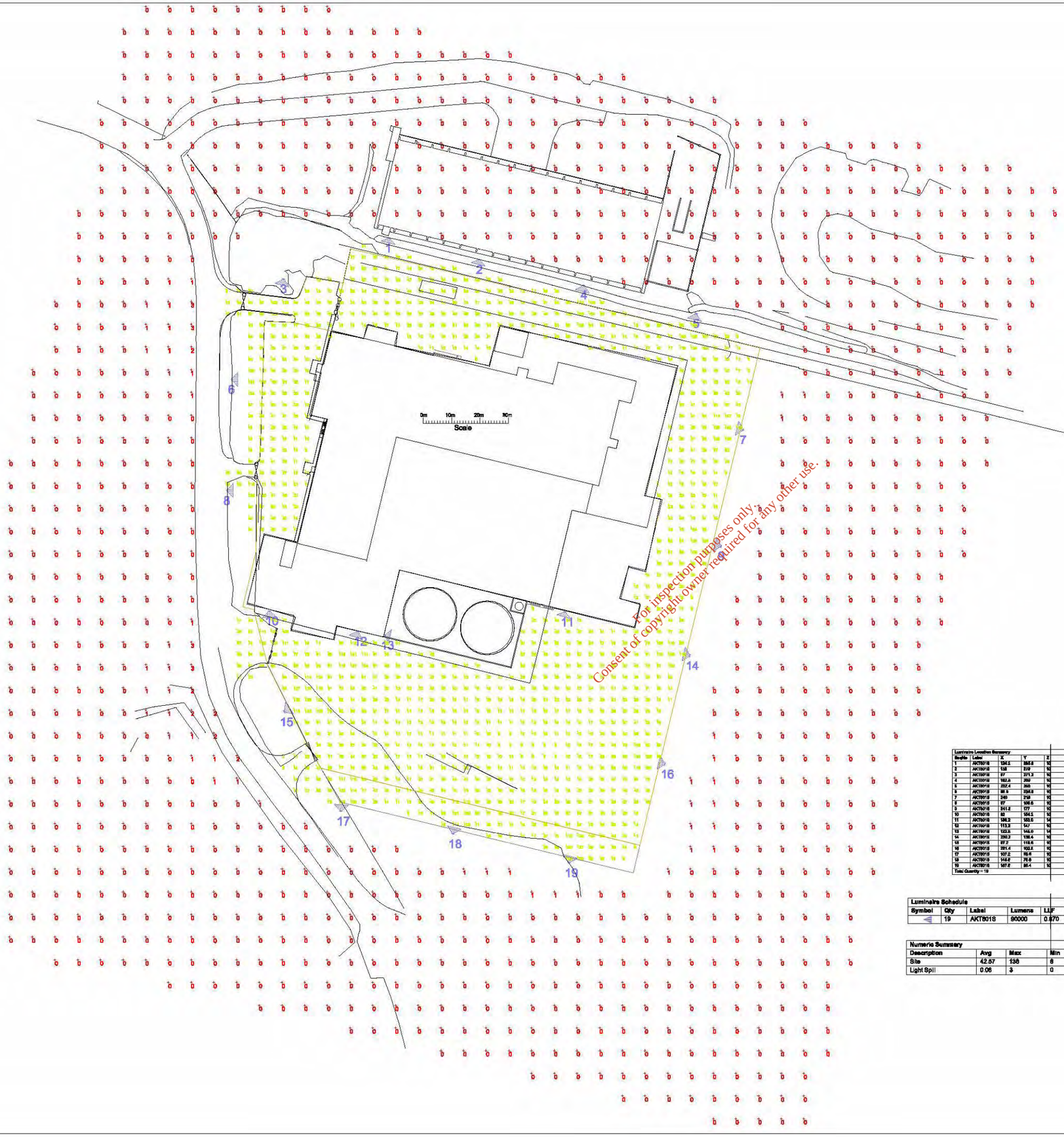
The Further Information submitted to Limerick County Council stated that a survey of the existing building had been undertaken, which confirmed that it was not constructed using asbestos containing materials. The results of the asbestos survey are included as Appendix 6 of this EIS.

Table 3.9 Demolition Quantities for Demolition of Lean-to Structure

Measurement	Value
Building Area	28.3 m x 7.9 m
Building Height to Eaves	4.8 m
General Materials	**Quantity**
Roof Cladding	231.39 m^2
Wall Cladding	101.13 m^2
Purlins	226.4 m
Sheeting Rails	146 m
Plywood	57.6 m
Roof Lights	6 no.
Structural Steel	**Quantity**
Columns	28.8 m
Rafters	49.059 m
Eaves Beams	31.2 m
Bracing	35.2 m
Door Beam	13 m

3.4.2 Phasing of Works

The proposed composting and biogas facility will be constructed in one phase. It is anticipated that the duration of the construction phase will be approximately six months. Roads in the vicinity of the site will be kept clean and free of mud and debris arising on the construction site. Fuel will be stored in a bunded area within the construction site. All vehicle refuelling will be completed within a bunded area/hardstanding area within the construction compound to prevent accidental spillage of hydrocarbon contaminants.



Luminaire Location Summary						
Graphic	Label	X	Y	Z	Orient	Tilt
1	AKT601S	134.1	385.8	10	350	70
2	AKT601S	158	349	10	350	70
3	AKT601S	97	371.3	10	356	65
4	AKT601S	182.8	290	10	356	65
5	AKT601S	232.4	265	10	356	65
6	AKT601S	80.5	324.8	10	3	65
7	AKT601S	249	218	10	189	65
8	AKT601S	67	186.5	10	3	65
9	AKT601S	241.2	177	10	189	65
10	AKT601S	83	164.5	10	271	65
11	AKT601S	184.3	103.6	14	354	70
12	AKT601S	113.3	147	10	251	65
13	AKT601S	133.3	143.9	14	346	70
14	AKT601S	230.3	138.4	10	168	65
15	AKT601S	87.2	118.6	10	36	65
16	AKT601S	201.4	103.6	10	168	65
17	AKT601S	107.2	85.6	10	85	65
18	AKT601S	148.6	76.6	10	76	65
19	AKT601S	187.6	85.4	10	76	65

Total Quantity = 19

Luminaire Schedule						
Symbol	Qty	Label	Lumens	LLF	Description	Filename
	19	AKT601S	90000	0.670	AKTRA 600w HPS	AKT601S.ies

Numeric Summary									
Description	Avg	Max	Min	Min/Avg	Min/Max	Units	PtSpcLr	PtSpcTb	# Pts
Site	42.57	136	6	0.19	0.06	Lux	4	4	1082
Light Spill	0.06	3	0	N.A.	N.A.	Lux	8	8	1221

Figure 3.14

Rev	Description	Date	Chkd
P1	ISSUED FOR PLANNING	24-04-08	JM

PLANNING ISSUE

Don O'Malley & Partners
Consulting Engineers - Building Services
62 O'Connell Street, Limerick, Ireland.
Tel: +353 (0)61 318877 Fax: +353 (0)61 310210
Email: services@domalley.com Web: www.domalley.com

APPROVED: JM CHECKED: BC DRAWN: RMC DATE: May 2008

ARCHITECT: Michael Punch & Partners, Henry St., Limerick

CLIENT: Mr. Binman, Ballysimmons, Co. Limerick.

PROJECT: Greenport Environmental Composting Facility, Foynes, Co. Limerick.

TITLE: Electrical Installation, Lighting Services - Site Lighting

SCALE: 1:500 at AO

JOB NO: 1662

DWG NO: E001

4 HUMAN BEINGS

4.1 Introduction

This section of the Environmental Impact Statement (EIS) discusses the key issues affecting human beings and the potential impacts of the proposed development on them. Human Beings comprise the most important element of the environment. One of the principal concerns in the development or application process is that people, as individuals or as communities, should experience no diminution in their quality of life from the direct or indirect impacts arising from the construction and operation of a development. Ultimately, all the impacts of a development impinge on human beings, directly and indirectly, positively and negatively. Direct impacts include matters such as noise, air and landscape quality. Indirect impacts may relate to many other things such as flora, fauna, road traffic and property values. Analysis of the socio-economic impacts of a development complements the biophysical focus of other parts of the EIS. The key trade-offs in assessing the costs and benefits of a development proposal tend to revolve around the balancing of socio-economic benefits, usually in terms of demography and employment, against biophysical cost within the broader context of sustainability.

The key issues assessed in this section of the EIS include population, community and employment, health and safety, land-use, and tourism. This study has been completed in accordance with guidelines as recommended by the Environmental Protection Agency's '*Guidelines on Information to be contained in Environmental Impact Statements*' (EPA, 2000).

4.2 Methodology

Information regarding human beings and general socio-economic data were sourced from the Central Statistics Office, Limerick County Development Plan 2005-2011 and the Limerick City Development Plan 2004-2010. This includes an examination of the population and employment characteristics of the area. This information was sourced from the most recent census, The Census of Ireland 2006, The Census of Agriculture 2000 and from the Central Statistics Office website.

Census information is divided into State, Provincial, County, Major Town and Electoral Division level. In order to make inferences about the population and other statistics in the vicinity of the proposed mixed development, the study area was defined in terms of the Electoral Divisions (EDs). The development lies within the Shanagolden Electoral Division area and is surrounded by four other EDs: Aughinish, Craggs, Loghill and Shanid. These five EDs make up the Study Area for this section of the EIS. They encompass a land area of approximately 7,526 hectares. The locations of the EDs studied are shown in Figure 4.1. The five EDs in the study area had a combined population of 2,725 in 2006 (based on 2006 Census of Ireland data).

The northwestern half of the Aughinish ED and the northeastern section of the Shanagolden ED are dominated by areas of industrial influence. While these particular areas of the EDs are under development pressure, the remainder of the study area is rural in nature, with agriculture being the predominant land-use. The vast majority of the study area is outside of settlement centres and is not subject to development pressure as would be expected on the urban fringe of Limerick City, although there has been a significant increase in the number of one-off houses being built in rural parts of the county in recent years.

4.3 Receiving Environment

4.3.1 Population

The population of Ireland saw a rapid decline in the mid 19th century due to the famine and emigration, leaving the country with half its pre-famine population (6,528,799) at the beginning of the 20th century (3,221,823). The early 1960s saw the lowest recorded population figure of 2,818,314 in 1961, but since then the population of the State has increased gradually to 4,239,848 in 2006, a figure not recorded since the 1860s. The population of the State increased by 322,645 persons between 2002 and 2006 to reach the highest recorded census level since 1861, according to Census 2006. The total figure for the population enumerated on census night 23rd April 2006 was 4,239,848 persons, compared with 3,917,203 in April 2002, representing an increase of 8.2 percent in four years or approximately 2 per cent per annum.

Limerick County saw a similar increase in population between the 2002 and 2006 Censuses, with an 8.4 percent increase of 10,235 people. The national and county trend was not followed by Limerick City, which recorded a slight decline in population of 1,484 people in the four years to 2006. This is shown in Table 4.1. The population in the area surrounding the proposed development has also been assessed (see Table 4.1.).

Table 4.1 Population Data from 2002 and 2006 Census

Area	Persons 2002	Persons 2006	Actual change 2002-2006	Percentage change 2002-2006
Ireland	3,917,203	4,239,848	322,645	8.2
Limerick City and County	175,304	184,055	8,751	5.0
Limerick City	54,023	52,539	-1,484	-2.7
Limerick County	121,281	131,516	10,235	8.4
130 Shanagolden ED	981	1,004	23	2.3
123 Loghill ED	674	707	33	4.7
109 Aughinish ED	230	264	34	12.8
131 Shanid ED	456	478	22	4.6
113 Craggs ED	267	272	5	1.8
Study Area	2608	2,725	117	4.3

Following a static period between the 1980s, the population of County Limerick has increased steadily, increasing from 161,956 in 1991 to 184,055 in 2006, as shown in Figure 4.2.

All EDs within the study area have seen population growth in the four years between the 2002 and the 2006 Census. The rate of population growth is highest in Aughinish, albeit with a low starting figure of 230 persons in 2002. Shanagolden ED has the highest populations of any of the study area EDs. The population growth rates for the study area EDs are nearly all below the rates for the state and for County Limerick, with the exception of Aughinish which had a population growth rate of 12.8 percentage during the 2002 – 2006 period. Generally the percentage change in the study area was much lower than that for County Limerick. This is likely to be due to the fact that the study area is outside any areas with development pressures that would be expected in areas closer to large population centres such as Limerick City. This is illustrated in Table 4.1.

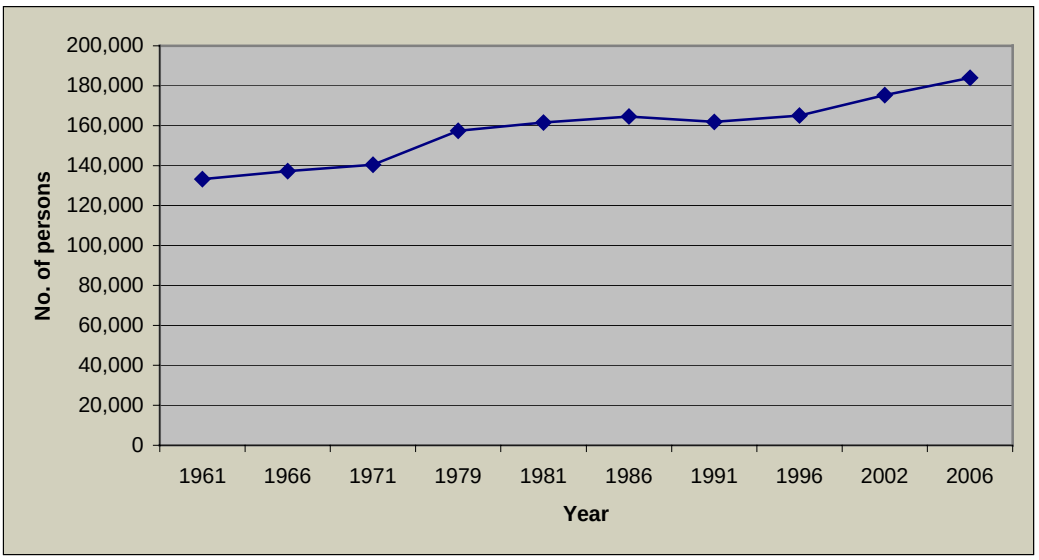


Figure 4.2 Number of Persons in County Limerick 1961-2006

Table 4.2 shows the population density of each of the EDs within the study area. Population density in Limerick City is also given for comparison. These figures are derived by dividing the population of each ED in the 2006 census by its land area and are given in persons per square kilometre. This provides further information as to the nature of the EDs (rural or urban)

Table 4.2 Population Density within the study area, Limerick City and County.

Area	Land Area (Sq km)	Population (Persons)	Density (Person per Sq km)
109 Aughinish ED	11.22	264	23
113 Craggs ED	14.00	272	19
123 Loghill ED	21.88	707	32
130 Shanagolden ED	10.19	1,004	98
131 Shanid ED	17.97	478	26
Study Area	75.26	2,725	37
Limerick City	20.35	52,539	2,581
Limerick County	2739	13,156	48
State	70,182	4,239,848	60

It can be seen from the results in Table 4.2 that the study area has a population density similar to that of a rural area with population densities of less than one hundred persons per square kilometre. This is in line with the average population density in county Limerick of 48 persons per square kilometre. Shanagolden is the only ED that approaches this hundred person threshold. All of the EDs are far less densely populated than Limerick City, which has an average density of 2,581 persons per square kilometre.

Table 4.3 shows the average household sizes in the State, County, Study Area and in the Shanagolden ED, in which the proposed works are located. The average size of households in the State has shown a marginal decrease between the 2002 and 2006 Censuses. There was also a marginal decline in both Co. Limerick and in Limerick City, being slightly more rapid in Limerick City. The average size of household in both Shanagolden ED and within the Study Area has remained constant between the

period 2002 and 2006. The average household size in these areas is marginally larger than the national average.

Table 4.3 Number of Households and Household Sizes in 2002 and 2006

Area	2002		2006	
	No. of Households	Avg. Size (persons)	No. of Households	Avg. Size (persons)
State	1,287,958	2.9	1,469,521	2.8
Limerick County	33,874	2.9	38,210	2.8
Limerick City	18,945	2.7	19,550	2.6
Limerick County & City	57,323	2.9	64,225	2.9
Shanagolden ED	322	2.9	348	2.9
Study Area	854	2.9	916	2.9

Table 4.4 below shows the percentage of the population of the State, County Limerick, the Study Area and Shanagolden ED within certain age groups as defined by the Central Statistics Office. The Study Area shows a lower percentage of the population in each of the age categories with the exception of the 45-64 range, which is significantly higher than the national average.

Table 4.4 Population expressed as percentage per age category in 2002

Area	Age Group				
	0 – 14	15 – 24	25 – 44	45 – 64	65 +
State	20.4	14.9	31.7	21.9	11.0
Limerick County	20.2	16.4	30.2	22.7	11.5
Limerick City	17.8	18.5	30.4	20.8	12.4
Limerick County & City	19.5	17.0	30.2	22.2	11.0
Shanagolden ED	16.2	13.8	30.2	28.6	11.0
Study Area	20.3	12.8	28.1	28.2	10.6

4.3.2 Employment

4.3.2.1 Employment Status

The labour force consists of those people who are able to work (i.e. are over 15, out of full time education and not performing duties that prevent them from working). In 2006, there were 2,109,498 persons in the labour force in Ireland; 164,084 in Co. Limerick (excluding Limerick City) with 1332 workers within the Study Area. Table 4.5, shows the percentage of the total population aged 15+ in the labour force (i.e. at work, seeking first time employment or unemployed) and not in the labour force (i.e. student, retired, unable to work, etc.), for the State, Limerick and the Study Area. This allows the comparison of the employment situation in the study area with the county and national situations.

In the 2006 Census, both County Limerick and the Study Area showed a percentage of the population in the labour force that is significantly higher than the national average. In addition, unemployment in Co.Limerick is below the national average and there is no unemployment shown in the study area.

Co. Limerick and the study area have a significantly lower percentage of people outside the labour force than the State. The percentage of people under the home

duties and unable to work categories is lower in County Limerick and the study area than in the state. The percentage of retired people is however marginally higher in the study area than the state.

Table 4.5 Employment Status 2006

		State	County Limerick	Study Area
% in Labour Force:		45.5	79.8	79.9
	At work	91.5	92.9	99.6
	1st time job seeker	1.4	1.1	0.4
	Unemployed	7.1	5.8	0
% Not in Labour Force:		54.5	20.2	20.1
	Student	21.6	32.8	27.6
	Home duties	34.5	29.1	30.6
	Retired	29.5	26.9	29.9
	Unable to work	13.4	10.5	10.9
	Other	1	0.7	1

4.3.2.2 Employment by Socio–Economic Group

Socio–economic grouping divides the population into categories depending on the level of skill or educational attainment required. Higher professional includes scientists, engineers, solicitors, town planners and psychologists. Lower professional includes teachers, lab technicians, nurses, journalists, actors and driving instructors. Skilled occupations are divided into manual skilled like bricklayers and building contractors; semi – skilled e.g. roofers and gardeners; and unskilled, which includes construction labourers, refuse collectors and window cleaners.

Table 4.6 shows the population in terms of socio-economic groupings, with comparisons between the percentage composition in each grouping in the State, County and Local Study area. The groupings are each assigned a letter for the purposes of tabulation.

A = Employers and Managers
B = Higher Professional
C= Lower Professional
D= Non Manual
E= Manual Skilled
F= Semi Skilled
G= Unskilled
H= Own account Workers
I= Farmers
J= Agricultural Workers
Z= All Others Gainfully Employed and Unknown

The socio-economic groupings within the study area show higher than State and County averages employed in the Manual Skilled to Unskilled categories. This may be due to the close proximity of large industrial areas, which would potentially employ these workers within Aughinish ED and Shanagolden ED. The socio-economic groups within the study area display lower than average in the Professionals and Managers

categories. This may be due to the distance of the Study Area from any large centres such as limerick City were higher percentages of professional sectors would be expected. The low percentage of Agricultual workers in the study area indicates a low percentage of land which has been planted for crops.

Table 4.6 Percentages of those employed in each socio – economic group

Grouping	%A	%B	%C	%D	%E	%F	%G	%H	%I	%J	%Z
State	16.01	5.86	9.47	15.98	11.64	9.15	4.19	5.84	5.81	0.72	15.28
Limerick County	14.44	6.02	9.280	13.37	12.64	10.25	4.04	5.3	9.45	0.76	14.39
Study area	11.40	2.70	7.20	12.70	16.60	12.5	8.70	4.7	8.20	0.20	15.20

4.3.2.3 Sources of Employment

Although there are some areas of heavy industry within Shanagolden and Aughinish EDS, the study area is essentially rural and is considered to be an area of strong agricultural base with some areas that have been defined as structurally weak areas by the Limerick County Development Plan. Structurally weak areas are generally more distant from major urban areas and their associated pressure. These areas are subject to population and economic decline.

There are many potential sources of employment in and around Foynes, the largest of which is Aughinish Alumina Ltd., which employs 500 permanent staff and 200 contractors. In addition to this company, there are a lot of activities around Foynes Port that provide potential sources of employment. These business include shipping and forwarding companies, fuel companies, mechanical engineers, commercial vehicle and haulage contractors, fork lift hire and marine surveyors. In town of Foynes, the Foynes Flying Boat Museum is also a potential source of employment.

Wyeth Nutritionals Ireland in Askeaton, which lies approximately nine kilometres east of Foynes, is one of Europe's largest producers of infant and child nutritional products. Almost 600 people are employed at the facility.

Aside from the local industry/business, employment opportunities are available in Limerick City, which is situated approximately 30 kilometres east of Foynes. Economically, Limerick City is known as the hub of the Mid West Region or the Shannon Region. It is one of the main economic regions outside of Dublin and Cork. As a result, there are many employment opportunities in the city.

Enterprise Ireland, in its directory of manufacturing and internationally trading companies, lists 58 companies in the Limerick area. Approximately one third of these companies employs between 10 and 24 people, while another third employs between 25 and 49 people. Twelve companies employee between one and nine people, and eight companies employ between 50 and 99 people. One company, OMC Engineering Ltd., employs between 250 and 499 people. This company is located on the Ballysimon Road and produces semi-stainless steel and architectural stainless and mild steel products for the construction industry.

The Irish Development Agency (IDA), in its directory of overseas manufacturing and international service companies, lists 29 companies in Co. Limerick. None of these are located in the immediate vicinity of the proposed development site. There are many companies including Dell and Vistakon in Plassey Park and Analog in Raheen Industrial Estate to the south of Limerick City. These workplaces are situated within an easy commuting distance from the study site. Until recently, Dell employed approximately 3,000 people directly at its Limerick facility, and it was estimated that

the company also contributed indirectly to 30,000 jobs in the Mid West region. However Dell have recently announced their intention to reduce their employees by 1,500. Despite these staff reductions they are still considered to be a major employer in the region. Vistakon Inc. is a division of Johnson & Johnson and is one of the largest contact lens manufacturing plants in the world. The only Vistakon production facility outside of the US is in Limerick City. It was announced in February 2008 that Vistakon, with the support of the IDA, would be investing €100 million in a further expansion of its manufacturing operation. This expansion was expected to create 75 extra jobs at the facility, which already employs over 600 people. Analog employs 1,300 staff and is involved with the production and design of circuits and semiconductors etc. for use in computers, cameras and electrical equipment.

4.3.3 Education

4.3.3.1 Pre-schools

There are three Health Service Executive (HSE) registered pre-school services in the study area. These include childminding services and sessional pre-school services. The HSE website (www.hse.ie) defines childminding services as *'a pre-school service which may include an overnight service offered by a person who single-handedly takes care of pre-school children, including the childminder's own children, in the childminder's home for a total of more than two hours per day, except when the exemptions in Section 58 of the Child Care Act 1991 apply'* and sessional pre-school service as a *'a planned programme to pre-school children for a total of not more than 3.5 hours per session. Services covered by the above definition may include pre-schools, playgroups, crèches, Montessori, pre-schools, naíonraí, notifiable childminders or similar services which generally cater for pre-school children'*.

4.3.3.2 Primary and Secondary Schools

There are a number of primary schools located within the study area including Scoil Naomh Mhuire/Ballyhahill National School, Loghill National School and Foynes National School. The primary school located closest to the site of the proposed development is Foynes National School (N.S.), situated approximately one kilometre to the west of the proposed development site.

Two secondary schools were identified within the study area: Mercy Secondary School in Foynes and the Vocational School in Shanagolden. Foynes Secondary School is the closest to the study site, situated approximately one kilometre west of site of the proposed development.

4.3.3.3 Third Level Education

There are several third level education facilities available in the Limerick area. The University of Limerick (UL) campus is located to the east of the Limerick city, approximately 35 kilometres from the site at Foynes. The university has a student population of approximately 10,000 students and major areas of research include Biosciences, Environment and Bioengineering, Information and Communications Technologies, Materials and Surface Science, Work, Quality and Productivity, Humanities and Social Sciences. The UL campus also houses the primary sports science facility in Ireland.

The Limerick Institute of Technology (LIT) has approximately 6,500 students and is located to the northwest of Limerick City, approximately 30 kilometres to the east of the site at Foynes. LIT offers a wide range of fulltime courses, and is particularly strong in the areas of IT, Building Economics, Business and Engineering. LIT also incorporates the Limerick School of Art and Design.

Additional third level educational establishments in the Limerick area include Mary Immaculate College and Griffith Business School.

4.3.4 Services

4.3.4.1 Access and Public Transport

4.3.4.1.1 Road

Limerick City is located approximately 190 kilometres from Dublin, 103 kilometres from Cork and 105 kilometres from Galway. The city is strategically located on the National Primary Road network, with Ennis and Galway linked via the N18, Cork via the N20, Dublin via the N7, Killarney on the N21, 23 and Tralee on the N69. The N69 runs in an east west direction from Limerick City towards Foynes and Tarbert before turning south towards Listowel and Tralee. The proposed facility at Foynes is accessed via a service road to the Port Area, which leads from the main N69 road.

4.3.4.1.2 Bus

Bus Éireann's County Limerick service operates seven buses daily from Monday to Saturday and one on Sunday which travel from Limerick to Ballybunion via Foynes. Similarly, six buses on Monday to Friday and two on Sunday operate in the opposite direction from Ballybunion to Limerick via Foynes.

From Colbert Station near Limerick City Centre, Bus Éireann provides hourly bus services to Dublin, Ennis, Galway and Cork. Changes are possible along all routes in order to reach alternate destinations. From the bus stations in Limerick and Dublin, routes are offered to destinations throughout Ireland, and even to the UK and mainland Europe. Local services to approximately 28 destinations, including Shannon Airport, are also provided daily from Colbert Station.

4.3.4.1.3 Rail

The closest train station to the site of the proposed development is Colbert Station in Limerick City. Colbert Station in Limerick is the third busiest train station in the country. From here, Iarnród Éireann provides a daily rail service to Cork and Dublin, as well as connecting services to other towns. In recent years, the station has undergone a complete refurbishment and upgrading, including the building of a new concourse. Limerick Junction is another major station located on the Cork/Dublin line, approximately 35 kilometres from Limerick City, for trains serving many parts of Ireland. Limerick Junction is not a terminal station but does experience a heavy traffic flow (*Source: Limerick City, A Place to Live and Work – Department of Foreign Affairs*).

4.3.4.1.4 Air

Shannon Airport is located approximately 15 kilometres northeast of the proposed development site, on the northern shore of the Estuary. This is an international airport with many domestic flights daily, as well as flights to the UK, Europe and the USA. The airport, operated by Dublin Airport Authority, is the second busiest airport in Ireland, serving approximately 3.6 million passengers in 2007. It has been an important gateway to the West of Ireland since its establishment in 1942. Bus Éireann provides daily services from Shannon Airport to Limerick, Ennis and Galway, with further connections to Dublin, Waterford, Tralee and Killarney among others. The airlines serving Shannon Airport include Aer Lingus, Ryanair, Air France, Continental Airlines, Delta Airlines, Air Transat, Belavia and US Airways. From

Shannon, there are regular daily flights to Dublin and the time taken to fly from Shannon to Dublin is 45 minutes.

Coonagh airfield is located approximately 28 kilometres east of the proposed development site. This 60-year old airstrip is one of the oldest in Ireland and is home to Limerick Flying Club. This airfield provides access for small aircrafts.

4.3.4.2 Healthcare

There are four hospitals in the Limerick City area approximately 30 kilometres east of the site of the proposed development. The Mid-Western Regional Hospital located in Dooradoyle, provides an extensive range of medical services. Facilities include Out-Patient Department, Endoscopy Unit, Renal Dialysis, Intensive Care, Coronary Care and 12 theatres, Paediatric Unit, Accident and Emergency, Audiology and a School of Nursing. There are 426 in-patient beds and 86 day places. The Mid-Western Cancer Centre is also located on the premises. Other Mid-Western Regional Hospitals, with limited facilities, are located in Ennis and Nenagh. St. Munchin's Regional Maternity Hospital on the Ennis Road provides colposcopy obstetric services including antenatal care, antenatal classes, counselling services, postnatal care and other maternity services for the Mid West Region. It also has a neo-natal special care baby unit and a school of midwifery.

St. John's Hospital is located at St. John's Square, close to Limerick city centre. This hospital specialises in General Medicine, General Surgery and Gynaecology, and provides a 12-hour Accident & Emergency/Minor Injuries service each day Monday to Friday. Barrington's Hospital is a private hospital and Medical Centre located at George's Quay close to the city centre. The hospital provides a wide range of medical and surgical services.

St. Nessan's Orthopaedic Hospital is located outside the city, in Croom, Co. Limerick, approximately 27 kilometres southeast of the site of the proposed deveopment. It provides orthopaedic services for the Mid-West region, and treats approximately 2,500 patients each year. Diagnostic and treatment services are provided including orthopaedic surgery physiotherapy, radiology, hydrotherapy and orthotic/prosthetic and footwear service.

In addition to these hospitals there is a host of General Practitioners, Pharmacists, Opticians and Dentists in the city area also. There is also a local General Practitioner in Foynes.

4.3.4.3 Amenities and Community Facilities

There are several local amenities and community facilities within the local village of Foynes and in the surrounding area. Three Roman Catholic churches were identified in the local area: St. Senan's Parish Church in Foynes and Knockpatrick Church and Shanagolden Church south of Foynes. There is also a fire station in Foynes. The Foynes Flying Boat Museum is a popular tourist destination in the southwest of Ireland according to the Department of the Arts, Sport and Tourism website. In addition there are several pubs in Foynes village including the Shannon House Pub and Foynes Inn.

Apart from local amenities Limerick City is situated approximately 30 kilometres west of the site of the proposed development and is well served by a wide range of professional services such as accountancy firms, solicitors, architects, engineers, estate agents, banks and building societies. The city houses the principal offices of Limerick City Council and the head office of Bord na gCon. Also located in the city are

the Regional Headquarters of the Army, the Garda Divisional Headquarters, the Regional Head Offices of the Electricity Supply Board, Revenue Commissioners and Irish Rail, the Area Headquarters of the District and Circuit Courts, the Land Registry, the Regional Local Office of FÁS and the Limerick District Headquarters of the Post Office. (*Source: Limerick City, A Place to Live and Work – Department of Foreign Affairs*)

Limerick City offers a diverse range of shopping options, from major stores to smaller retail units. Retail centres include the Arthur's Quay shopping centre in the city centre, the Crescent shopping centre on the Cork Road and the Parkway Shopping Centre on the Dublin Road. Limerick City Library provides library services at its city centre branch on Michael Street, and additional branches at Roxboro and Moyross. There are four Garda Stations in Limerick City. They include those at Henry Street, Mary Street, Mayorstone Park and Roxboro Road.

Limerick City is home to the Irish Chamber Orchestra, the World Music Centre, Daghda Dance Company and the internationally renowned Hunt Museum. The Belltable Arts Centre provides a cinema, theatre and visual arts gallery, while the University Concert Hall offers concerts, theatre performances and popular national and international acts. Cinemas in the Limerick area include the Omniplex in Dooradoyle and Storm Cinema at Castletroy.

4.3.4.4 Sports Facilities

There are few local sports facilities in the vicinity of the proposed development site due to its rural location, however Foynes does have a Yacht Club with over 130 members and associated Clubhouse and bar facilities. In addition Askeaton GAA club is situated approximately eight kilometres east of the site of the proposed development. There is also likely to be some local sporting football, soccer and rugby clubs in the study area. Approximately 30 kilometres west of the site Limerick City provides a diverse range of facilities for golf, rugby, Gaelic football and hurling, soccer, tennis, squash, horse riding, racing, fishing and greyhound racing. Other athletics and sport facilities in the area include the University of Limerick Arena, which incorporates a 50-metre Olympic standard swimming pool and those of the National Coaching and Training Centre. In terms of water sports, Limerick also has two rowing clubs, and white-water sports are on offer at the Curragower Falls. There are two main coarse angling venues in the vicinity of Limerick City. They include Plassey, which lies adjacent to the University of Limerick campus, in Castletroy.

4.3.5 Tourism

Tourism is one of the major contributors to the national economy and is a significant source of full time and seasonal employment. During 2007, total tourism revenue generated in Ireland amounted to €6.45 billion, an increase of 5.9% from 2006. Between 2006 and 2007, the number of overseas tourists to visit Ireland increased by 4%, from 7.4 million to 7.7 million. Expenditure by overseas visitors to Ireland in 2007 was estimated to be worth €4.90 billion, compared to €4.69 billion in 2006. During 2007, a total of 7.9 million trips were taken within the Republic of Ireland by Irish residents, with an associated expenditure of €1.55 billion. This represents a significant increase of 8% on the number of domestic trips taken in 2006 while the associated expenditure rose by 11% (from €1.4 billion). (S*ource: Fáilte Ireland)*

Limerick City is considered to be the capital of the Shannon Region, one of the seven tourism regions in Ireland. The Shannon Region is comprised of Clare, Limerick County and City, South Offaly and North Tipperary. Table 4.8 shows the total revenue

and breakdown of overseas and domestic tourist numbers to each tourist region in Ireland during 2007.

Table 4.8 Tourist Revenue and Numbers in each Region during 2007 (Source: Fáilte Ireland)

Region	Total Reveune (€m)	No. of Tourists (000's)	Overseas Tourists (%)	Tourists from Northern Ireland (%)	Domestic Tourists (%)
Dublin	1,714.0	5,765	77.2	3.1	19.7
East & Midlands	476.2	1,934	46.1	3.7	50.2
South-East	526.9	2,134	47.7	0.5	51.8
South-West	1,280.0	3,968	51.5	0.6	47.9
Shannon	517.8	2,054	58.3	1.5	40.2
West	817.7	2,819	52.4	2.8	44.8
North-West	365.9	1,513	36.2	15.2	48.6
Total	5,698.4	20,187	57.6	3.1	39.3

During 2007, approximately 1,197,500 overseas tourists visited the Shannon Region in addition to 856,500 visitors from the Republic of Ireland and Northern Ireland. The total number of tourists to the Shannon Region increased by 2% from the previous year. The revenue generated by tourism in the Shannon region in 2007 was €517.8 million, an increase of 16.9% from €442.9 million generated during 2006. The Shannon region benefited from 10.2% of the total number of tourists to the country and 9% of the total tourism income generated in Ireland for 2007.

The proximity of Limerick City to Shannon International Airport is key feature in bringing tourism into the Shannon Region. The Foynes Flying Boat Museum is the closest tourist attraction to the proposed compost facility, this is situated approximately one kilometre to the west of the site. Aside from this, Limerick City itself is also a major tourist attraction, the River Shannon is a fishing attraction, and Bunratty Castle and Folk Museum is very popular tourist destination. The Limerick Tourist Information Centre is located on Arthur's Quay in the city centre and is open year round.

The Discover Ireland website lists 18 hotels, 12 bed and breakfasts, two guesthouses and five self-catering holiday homes in Limerick City. There are also two listed bed and breakfasts in Foynes. It is likely that there are also more unregistered or seasonal accommodation facilities available in the area.

4.3.6 Land-Use

The dominant land use in the area is pastoral agriculture, with 82.8% of land within the Study Area being farmed and 153 farms in total in the Study Area, according to the 2000 Census of Agriculture. There is an average farm size of 40.6 hectares. This is slightly higher than the average for County Limerick at 32.6 hectares. Crop tillage comprises a very low proportion of farmland (0.1%). Pasture makes up the highest land use at 57.9% and 31.0% of lands used for silage. 1.9% of lands are used for rough grazing and only 5.3% of lands are cut for hay. Details of the farm type and area they cover are shown in Table 4.9.

Although land-use in the study area is primarily agricultural, the land-use in the immediate vicinity of the proposed development to the north, south and west is made up of heavy industry and indeed the site of the proposed development is an

industrious site that has been recently abandoned. The area of land to the east of the site is owned by Irish Cement, but has not been developed for industrial purposes to date. The highly industrious area of Aughinish Alumina is located further to the east.

Table 4.9 Farm type, area and composition in Study Area

Total Area Farmed	6,213 hectares	
Farmland as a % of Study Area	82.80%	
Total Number of Farms	153	
Type	**Study Area (hectares)**	**% of Area Farmed**
Total Cereals	0	0
Fruit & Crops	15	0.01
Total Hay	330	5.3
Pasture	3603	57.99
Rough Grazing	119	1.9
Total Silage	1928	31.03
Undetermined	218	3.5

4.3.7 Health and Safety

4.3.7.1 Seveso Sites

A Seveso site is an industrial premise that has notified the Health and Safety Authority (HSA) that it meets a specific threshold for quantities of hazardous substances as outlined in the EC (Control of Major Accident Hazards Involving Dangerous Substances) Regulations. These Regulations give effect to Council Directives 96/82/EC and 2003/105/EC which aim to limit the consequences for human beings and the environment of major accidents involving dangerous substances.

There is one Seveso site located within the Shannon Foynes Port Area, as described in Chapter 2 of this EIS, operated by Irish Bulk Liquid Storage Ltd. It is the policy of Limerick County Council, in addition to normal planning criteria, to ensure that new developments in the vicinity of existing Seveso establishments, where the siting or developments are such so to increase the risk or consequences of a major accident, within these distances, complies with the requirements of the Major Accidents Directive. The Council will consult with the HSA regarding any such proposals. The HSA has established consultation distances around premises designated as containing hazardous substances. A consultation distance of 500 metres has been established around the Irish Bulk Liquid Storage site.

The HSA also includes a second premise within the Shannon Foynes Port Area, on its list of sites that are covered by the Seveso Regulations, that of Inver Resources Ltd. The planning application for the Inver Resources site has been superceded by an application from Atlantic Fuel Supply Company Ltd., as described in Section 2.4 of this EIS on Planning History. The site to the north of the proposed development site is proposed to be developed by Atlantic Fuel Supply Company Ltd. for National Oil storage Agency reserves, and will also be classified as a Seveso site.

4.3.7.2 Health & Safety Plan

A site-specific Health and Safety Plan for the proposed composting facility is currently being prepared. All site staff will be made aware of and adhere to the company Health and Safety Plan. The policies of this Health & Safety Plan will have regard to those of the parent company of Greenport Environmental Ltd., Mr. Binman

Ltd. The Health and Safety Statement of Mr. Binman Ltd. is included as Appendix 4 to this EIS. Only appropriately qualified and trained personnel will be permitted to operate machinery onsite. A Construction Safety Plan will also be developed, and adhered to during the construction phase of the proposed development.

4.4 Likely and Significant Impacts on Human Beings and Associated Mitigation Measures

4.4.1 'Do Nothing' Impact

If the proposed development was not permitted, it is likely that the site of the proposed development will remain as an abandoned industrial site and the prospect of employing 10-15 people in the compost facility would be lost. Waste recycling and diversion from landfill targets would remain at present levels and an opportunity would be lost to increase recycling rates and reduce the amount of waste going to landfill. If an alternative development were not to occur, the current lack of land management within the site would continue and the site would become more overgrown and unkempt in time. Littering and dumping are likely to occur, thereby creating an eyesore and potential public hazard.

4.4.2 Construction Phase Impacts

4.4.2.1 Community and Employment

4.4.2.1.1 Short-Term Significant Positive Impact

New developments help to sustain employment in the construction trade. The construction works for the construction of the extension and the refit of the existing warehouse will be put to tender, which will allow local firms to bid for the works. Concrete will be sourced locally, subject to price agreement. The proposed development will therefore have a direct positive impact on the local employment. It is likely that the majority of construction workers will be based locally and therefore no significant increase in the population of the Study Area will arise during the construction phase.

4.4.2.2 Health and Safety

4.4.2.2.1 Short-Term Potential Significant Negative Impact

Construction of the proposed development will necessitate the presence of a construction site. Construction sites and the machinery used on them pose a potential health and safety hazard to construction workers if site rules are not properly implemented.

Mitigation

All site staff will be made aware of and adhere to the Health & Safety Authority's *'Guidelines on the Procurement, Design and Management Requirements of the Safety Health and Welfare at Work (Construction) Regulations 2006'*. A site-specific Construction Safety Plan will be developed, and adhered to during the construction phase of the proposed development.

4.4.2.3 Traffic

4.4.2.3.1 Potential Short-Term Slight Negative Impact

The site of the proposed development is accessed via the internal roadways of the Shannon Foynes Port Area, which is in turn accessed from two separate junctions

with the N69 Limerick to Tralee National Secondary Route. Vehicles entering and exiting the site of the proposed development will use the easternmost junction of the Port Area with the N69, which is located approximately 830 metres south of the site.

In the absence of mitigation, traffic associated with the delivery of materials and equipment to the site of the proposed development has the potential to disturb residents along the N69 in the Foynes area. A Traffic and Transport Assessment (TTA) of the proposed development has been carried out by CST Group in conjunction with Michael Punch & Partners. The results of this assessment are presented in Chapter 11 of the EIS. The TTA states that the volumes of traffic that will be generated during the construction phase of the development will be small in comparison to those modelled for the operation of the development and therefore did not require traffic analysis.

Mitigation
In order to mitigate against traffic disturbance to residents in the area during the construction of the proposed development, the following measures will be implemented:

- The route of least impact to local residents will be used for deliveries, i.e. deliveries from the east will turn off north before the town, thereby avoiding the large residential area.
- No construction traffic will deliver to the site or noisy machinery be operated outside the working hours of 8:00am to 6:00pm Monday to Friday or 8:00am to 4:00pm Saturday.

4.4.2.4 Dust

4.4.2.4.1 No Impact

The construction phase of the proposed development site will not have an adverse impact on local air quality within the Foynes Port area or in the wider Foynes area given the relatively small scale nature of the composting facility development, together with the proposed mitigation measures that shall be implemented to ensure that the primary air pollutant that is dust, is controlled and managed effectively at the site.

Contractors delivering fine aggregate materials in open top delivery trucks to the site shall be instructed to use a suitable cover so as to minimise the potential for wind to generate airborne dusts on transit to the site and to minimise the impacts on local air quality on the greater environment over the transport route from source to delivery point.

Drivers delivering materials to the site shall be instructed by site management to turn off idling vehicle engines when the vehicles are on site for extended periods.

It is proposed that all plant, materials and operatives vehicles shall be stored in dedicated compound areas in order to minimise the interaction that each element may have on the other. That is, the separation of operative vehicles from aggregate material stockpiles will minimise the potential for vehicle movements to generate dust.

4.4.2.5 Noise

4.4.2.5.1 No Impact

The distance of construction activities which will be limited to the existing site area from the nearest noise sensitive receptors is a minimum of 450 metres which will ensure that there will be no adverse noise impact from construction activities on the closest residential receptors to the site.

Given the existing volumes of HGV traffic that currently operate within the Port area, the relatively small scale nature of the development, and the extended distances between the site and the closest receptors, it is not expected that the predicted short-term increase in HGV movements associated with the construction phase of the development will have an adverse impact on the existing noise climate of the wider area or on local receptors.

4.4.3 Operational Phase Impacts

4.4.3.1 Community and Employment

4.4.3.1.1 Long Term Moderate Positive Impact

It is anticipated that the development of the composting facility will result in the creation of 10-15 permanent positions within the company. In addition the development will secure the jobs of the 350 people that work for Mr. Binman as all incoming waste is likely to be sourced from the Mr. Binman Ltd. waste transfer station and recycling centre in Luddenmore, Grange, Co. Limerick, and from source-separated organic waste collections by Mr. Binman Ltd. The creation of employment will result in the consolidation of the population around the site by securing jobs in the region.

4.4.3.2 Health and Safety

The mitigation and control measures set out in this section of the EIS have been incorporated into the design of the facility, along with the use of Best Available Technology (BAT), and will be implemented to ensure that there is no impact on local ambient air quality from noise, dust, odour or bioaerosol emissions during the operational phase of the proposed development.

4.4.3.2.1 Employee Welfare and Safety

No Impact

Employee health and welfare will be protected by the following design and control operational measures:

Incoming feedstock will be moist, thereby minimising dust generation at the delivery stage. Shovel loaders will have fully enclosed, air-conditioned cabins with HEPA (highly efficient particulate air) filtration to protect the operators during transfer of materials. Personal protective equipment will also be utilised as appropriate. A programme of industrial hygiene monitoring will be conducted to ensure the health and welfare of the employess is not compromised.

The ventilation system within the building is designed with sufficient air changes to prevent build up of dust or bioaerosols. The regular cleaning and maintenance of internal building floors will further ensure there will be no build up of dust. The biogas, composting and maturation processing steps will all take place within sealed tunnels, thereby preventing exposure to employees. A specific dust collection and

filtration system will operate in the final composting refining process within this area of the building.

Potential Long-term Significant Impact
As with any industrial premises, the volume of machinery and equipment used for the operation of the site poses a potential health and safety hazard to workers if site rules are not properly implemented.

Mitigation
Only appropriately qualified and trained personnel will be permitted to operate machinery onsite, and personal protective equipment will be utilised as appropriate. A site-specific Health and Safety Plan for the proposed composting facility is currently being prepared. All site staff will be made aware of and adhere to the company Health and Safety Plan. The policies of this Health & Safety Plan will have regard to those of the parent company of Greenport Environmental Ltd., Mr. Binman Ltd. The Health and Safety Statement of Mr. Binman Ltd. is included as Appendix 4 to this EIS.

4.4.3.2.2 Odour

No Impact
The potential for odorous emissions from the proposed facility will be prevented by a series of state of the art design features, work practices and controls, as described in this section of the EIS. All composting activities, from material delivery and processing through to the loading of the final compost product, will occur indoors, within the facility building. All biogasing, composting and maturation will take place within fully sealed tunnels. The building shall operate under negative pressure with no point or area sources of odorous emissions. A negative pressure building is kept at a lower air pressure than the outside atmosphere, which ensures that air does not escape the building.

All incoming material to the proposed facility will be 'fresh', as source-separated feedstock will be sourced from material that is collected at least every two weeks, and the mechanically separated feedstock will be sourced from material that is collected weekly. This material will be delivered to the facility on a daily basis to ensure continuity of supply. All feedstock and end products entering and leaving the facility will be contained in covered vehicles. An inspection programme will be implemented to ensure all trailer coverings are in place.

There will be no storage of incoming material onsite prior to its processing. There will be no need to open waste bags or shred the waste, as these operations will have been carried out off-site. The final end-products of the composting process will be pasteurised and odourless. Once approved, the final material will be removed from the site. No material will be stored long-term on the site.

The proposed facility has been designed to include state of the art air abatement technologies. All air within the facility building and composting process air shall be vented to the scrubber, humidifier and biofilter systems, which are designed for purpose and are Best Available Technology. A description of these systems is included in Chapter 3 of this EIS. All plant and machinery shall be regularly maintained as part of a Preventative Maintenance Programme, and maintenance cover shall be available 24 hours per day to minimise equipment breakdown times.
The only potential odorous emission from the proposed facility will arise from exhaust air from the biofilter units. A comprehensive study of the emissions to atmosphere from the biofilter units has been carried out by Byrne Environmental

Consulting Ltd. as part of this EIA. The methodology and results of this assessment are set out in full in Chapter 8 of this EIS.

The odour assessment comprised a dispersion modelling study, which predicted the prevailing odour situation across the site and the surrounding area due to emissions from the proposed facility. Modelling output data showed that the hourly odour concentrations at the closest receptors to the site, and also within the industrial Foynes Port Area, will be below the nuisance criteria specified by the Environmental Protection Agency (EPA). Furthermore, the facility is located approximately 580 metres downwind of the closest receptor, which significantly exceeds the recommended 250 metres stand-off distance.

During the operational phase of the proposed development, odour monitoring shall be conducted according to the standards to be specified by the EPA in any Waste Licence issued to the facility, in order to assess the effectiveness of odour controls at local receptors. Regular odour patrols at the site boundary will also be conducted as part of the facility's Environmental Management System.

4.4.3.2.3 Dust

No Impact

The proposed facility will be designed and built as a negative pressure building, which will prevent dust from leaving the building. A negative pressure building is kept at a lower air pressure than the outside atmosphere, which ensures that air does not escape the building. External doors of the site building shall be fitted with air curtains to maintain negative pressure.

All proposed operations for the site will be contained indoors, in covered structures. The nature of the composting process requires the incoming material to be moist, and the biogas/composting/maturation steps will all take place within sealed tunnels inside the building, thereby minimising dust generation. Process generated dusts will be controlled as a result of the Central Air System, which shall vent all process building air into the proposed scrubbing, humidification and biofilter system. A dust collection and filtration system shall also operate to control dusts from the final composting refining process within this area of the building.

The regular cleaning and maintenance of internal building floors, site roads and yard areas will further ensure there will be no nuisance dust emissions from the facility. The design of the delivery area will ensure that the wheels of the vehicles will not be contaminated with material, thereby maintaining clean external surface areas and preventing feedstock material from leaving the building. The delivery area will have a steam-cleaning backup system in place, as will the dispatch area.

Greenport Environmental Ltd. will undertake all environmental monitoring, including the monitoring of dust deposition levels, as required by the EPA under the conditions of any Waste Licence issued to the facility. A complaint log will be maintained to ensure that any complaints made by members of the public are recorded and investigated.

4.4.3.2.4 Noise

No Impact

A noise impact assessment of the proposed development has been carried out by Byrne Environmental Consulting Ltd. The results of the assessment predict that the operation of the facility will be inaudible at the closest Noise Sensitive Receptor to the main facility building, which is located approximately 580 metres from the existing

building. The combined noise level from all sources operating within the facility was assessed assuming all machinery is operating simultaneously for 100% of the time. The methodology used and full results of the noise impact assessment are set out in Chapter 8 of this EIS.

All process activities at the proposed facility will take place indoors, which shall provide significant attenuation of noise. External doors will remain closed. All principal external plant, including the biofilter, shall be located on the northern façade of the facility building, which shall result in the screening of the noise from the closest receptors to the facility.

In order to further ensure that there is no impact on ambient noise levels, all site machinery will be shut down when not in use. The use of vehicle horns will be discouraged during the daytime period and will be banned during the early morning periods before 09:00hrs. A ten-kilometre per hour speed limit will apply on site and low noise level reverse warning alarms consistent with site safety requirements will be utilised.

In order to demonstrate the effectiveness of all noise control and minimisation techniques, a programme of noise monitoring and assessment shall be implemented at the site. The scope of such monitoring and assessment will be specified by the Environmental Protection Agency in any Waste Licence issued to Greenport Environmental Ltd. for the operation of the proposed facility.

4.4.3.2.5 Bioaerosols

No Impact

During the mechanical agitation of composting material, biological agents are aerosolised (i.e. become airborne), giving rise to the term 'bioaerosol'. Bioaerosols are not exclusive to composting facilities. They are constantly present in the ambient atmosphere as a consequence of dust and soil and the natural breakdown of vegetation. Bioaerosols include bacteria, fungi and organic constituents of microbial and plant origin (CRE, 2004). Focus to date has been on *Aspergillus fumigatus* fungus and bacteria, as described in Chapter 8 of this EIS on Air and Climate.
There is currently no published data on baseline bioaerosol monitoring in Ireland for *Aspergillus fumigatus*, dust, fungi or total bacteria.

The bioaerosol control measures set out in this section of the EIS shall be implemented at the facility to ensure that the potential risks to site employees, local residents and other employees of the Foynes Port Area are minimised and that the operation of the facility does not pose an unacceptable threat to human health. Furthermore, the closest domestic receptors to the facility are located 580 metres downwind of the site, which significantly exceeds the recommended minimum 250-metre set back from the facility.

All incoming material to the proposed facility will be 'fresh', as source-separated feedstock will be sourced from material that is collected at least every two weeks, and the mechanically separated feedstock will be sourced from material that is collected weekly. This material will be delivered to the facility on a daily basis to ensure continuity of supply. All feedstock and end products entering and leaving the facility will be contained in covered vehicles. This will minimise the generation of bioaerosols prior to delivery.

The delivery area is designed with a physical barrier to ensure the wheels of the vehicles are not contaminated with feedstock during the delivery process, thereby

preventing residual feedstock leaving the building. The delivery area will have a steam-cleaning backup system in place, as will the dispatch area. This will minimise off-site surface contamination by bioaerosols. All external site surfaces and internal facility floors shall be cleaned and swept regularly.

All material handling activities will occur only within the facility building, which will minimise the potential for the release of bioaerosol emissions to the outside environment. The facility building shall operate under negative pressure, which will minimise the potential for uncontrolled bioaerosol emissions. All air within the facility building and composting process air shall be treated in the scrubber, humidifier and biofilter systems.

Pending commencement of site activities, annual bioaerosol sampling shall be conducted at upwind and downwind locations relative to the location of the facility according to protocol to be specified by the EPA in any Waste Licence issued for the operation of the facility. All site staff shall be provided with training, which will include the control of emissions from the facility.

4.4.3.2.6 Vermin and Pests

No Impact

The proposed development will not attract unwanted pests or vermin into the local area. The proposed facility will be fully enclosed, with all processes taking place inside fully sealed biogasing/composting/maturation tunnels. Incoming material to the site will be delivered to the reception area within the facility. It will be thoroughly homogenised, and then transferred immediately into one of the tunnels, which will be sealed during the composting process, preventing the attraction of vermin. The process temperatures and humidity within the tunnel are not conducive to supporting vermin. There will be no storage of incoming material onsite prior to its processing. There will be no need to open waste bags or shred the waste, as these operations will have been carried out off-site. The final end-products of the composting process will be pasteurised and odourless. Once approved, the final material will be removed from the site. No material will be stored long-term onsite.

As an additional precautionary measure to prevent the attraction of vermin, a Pest Control Plan for the site of the proposed development has been prepared by Curtin Pest Control and was submitted to Limerick County Council as part of the change of use Planning Application No. 08/1633. The Pest Control Plan is included as Appendix 5 of this EIS. The Pest Control Plan for the site will encompass monthly service visits, immediate response to emergency calls and the installation of approximately 24 large tamper-resistant rat bait boxes in the external areas of the site. Tamper-resistant mouse bait boxes will also be installed in indoor areas. Curtin Pest Control operates to the Irish Pest Control Association's codes of practice.

4.4.3.3 Traffic

4.4.3.3.1 No Impact

There will be no negative impacts on human beings due to traffic or traffic-generated dust or noise associated with the operational phase of the proposed development.

The operation of the composting and biogas facility will involve the delivery of feed material to the facility, the on-site processing of this material and the subsequent export of the compost product off-site. Vehicles entering and exiting the site of the proposed development will use the easternmost junction of the Port Area with the N69, which is located approximately 830 metres south of the site. Vehicles will

therefore turn off before the town, thereby avoiding the larger residential area. The proposed facility is to be located at the site of a vacant but previously occupied commercial site, which would have had associated traffic movements associated with its past operation.

The N69 is a busy route subject to substantial volumes of traffic, some of which is freight goods and haulage vehicles. A Traffic and Transport Assessment (TTA) of the proposed development has been carried out by CST Group in conjunction with Michael Punch & Partners. The results of this assessment are presented in Chapter 11 of the EIS. The proposed facility has the potential to process up to 50,000 tonnes of material per annum, which would result in an estimated 30 daily HGV movements associated with the delivery of feed material to the site and the export of compost product from the site. This equates to an average of four HGV movements per hour during a typical working day. The TTA found that the additional traffic generated by the operational phase of the proposed composting/biogas facility can easily be accommodated at the existing junction with the National Road when combined with the predicted increased background flows on the National Road to the year 2025 and beyond.

Noise from Traffic

Increased traffic, particularly from heavy goods vehicles (HGV) during the operational phase of the proposed development, has the potential to impact noise sensitive locations along the routes surrounding the Foynes Port site.

An assessment of traffic-generated noise resulting from the proposed development has been carried out by Byrne Environmental Consulting Ltd as part of this EIA. The results of this noise impact assessment are included in Chapter 8 of this EIS. In summary, it was found that there will be no increase in traffic noise levels on the N69 National Secondary during the AM or PM peak hour flows along the site access road. The predicted HGV movements associated with the proposed facility will result in a negligible increase in the existing baseline noise levels at the closest Noise Sensitive Receptors to the facility.

Dust from Traffic

All deliveries to the site shall be contained in covered HGVs. Material will be moistened prior to delivery. Vehicles will only be driven on hard-standing areas and will be cleaned prior to delivery to the facility and prior to departing the dispatch area. Vehicles will be checked to ensure that covers are in place prior to delivery to and departure from the facility.

The design of the delivery area will ensure that the wheels of the vehicles will not be contaminated with material, thereby maintaining clean external surface areas and preventing feedstock material from leaving the building. The delivery area will have a steam-cleaning backup system in place, as will the dispatch area.

Local roads and site yard areas shall be swept and cleaned as necessary if it is observed that roads are being soiled by vehicles entering or exiting the site. As a result of these measures, there will be no impact on ambient air quality due to traffic-generated dust.

Impact of Traffic on Air Quality

With regards to the relatively low volumes of HGV traffic movements that will be associated with the operation of the proposed facility, it is predicted that the operation of the composting facility will have no adverse impact on local ambient air

quality. Continued developments in fuel technologies will further offer to minimise emissions of combustion gases and particulate matter from HGV diesel engines in the future and over the operational lifetime of the facility.

The traffic management system, as described in Chapters 3 and 11 of this EIS, includes a one-way system with separate incoming and outgoing weighbridges, which will minimise HGV time onsite. The practice of leaving vehicle engines idling unnecessarily or for prolonged periods will be discouraged and appropriate signage shall be clearly posted at the facility.

5 FLORA AND FAUNA

5.1 Flora and Fauna in the Existing Environment

This section is based on field visits made in November 2008 when the site of the proposed development was surveyed extensively and surrounding habitats were assessed. The survey work was carried out by two ecologists, from the staff of McCarthy, Keville, O'Sullivan Ltd. Fauna were surveyed through direct observation of bird and mammal species or of their signs and calls. Habitat suitability was also assessed for the likely occurrence of other species, which would not be present due to seasonal factors.

5.1.1 Methodology and Limitations

The flora and habitats of the site were assessed by means of a desk study of literature pertinent to the site and surrounding area and by field surveys of the site including a survey of flora, bird surveys and general observation work.

Seasonal factors that affect distribution patterns and habits of species were taken into account when conducting the surveys and the potential of the site to support certain populations (in particular those of conservation importance that may not have been recorded during the field survey due to their seasonal absence or cryptic nature) was assessed.

5.1.1.1 Field Study

A field visit was made to the site on the 19th of November 2008. The habitats present at the site were mapped and observations of plants, mammals/mammal signs and birds within the site were made throughout the study period.

Due to the lack of habitat diversity within the site, the use of relevés to evaluate percentage vegetation cover was not deemed necessary. Similarly, it was considered that (due to the low avifaunal diversity of the site) bird sampling techniques such as those recommended by Bibby *et al.* (2000) were not necessary. The site was instead systematically and thoroughly walked, habitats were assessed, classified and sketched on to field maps of the site. All bird species observed or heard within the site were recorded and the presence (or signs) of mammals, amphibians and reptiles was noted during the visit.

A limitation of the survey was the time of year the fieldwork was completed. Summer is usually the most appropriate time of year for ecological surveys, though even in summer some wintering species may not be recorded. Ideally surveys should be carried out in all seasons but this was not considered necessary for this site as it was felt that the habitats on the site could be identified during the Winter survey and a good estimation of baseline environmental conditions on the site could be achieved.

5.2 Published Information

5.2.1 Background to Designated Sites

With the introduction of the EU Habitats Directive (92/43/EEC) which was transposed into Irish law as the Natural Habitats Regulations, 1997, the European Union formally recognised the significance of protecting rare and endangered species of flora and

fauna and also, more importantly, their habitats. Member states were directed to provide lists of sites for designation.

5.2.2 Natural Heritage Areas

Natural Heritage Areas (NHAs) are sites that were designated for the protection of flora, fauna, habitats and geological sites of national importance. Management of NHAs is guided by planning policy and the Wildlife (Amendment) Act 2000. It was from these NHAs that the most important sites were selected for international designation as SACs and SPAs.

5.2.3 Special Areas of Conservation and Special Protection Areas

There are two types of EU site designation, the Special Area of Conservation (SAC) and the Special Protection Area (SPA). SACs are designated for the conservation of flora, fauna and habitats of European importance and SPAs for the conservation of bird species and habitats of European importance. These sites form part of "*Natura 2000*" a network of protected areas throughout the European Union.

Annex I of the Habitats Directive lists certain habitats that must be given protection. Certain habitats are deemed 'priority' and have greater protection. Irish habitats include raised bogs, active blanket bogs, turloughs, heaths, lakes and rivers. Annex II of the directive lists species whose habitats must be protected and includes Lesser Horseshoe Bat, Otter, Salmon and White-clawed Crayfish.

5.2.4 Sources of Information

The following sections detail the sources of published material that were consulted as part of the desk study for the purposes of the Environmental Report. These included the synopses of sites designated for their conservation importance compiled by the National Parks and Wildlife Service (NPWS) of the Department of the Environment, Heritage and Local Government (DoEHLG), bird and plant distribution atlases and other research publications.

5.2.4.1 Designated Areas

The National Parks and Wildlife Service (NPWS) publish synopses of the information regarding areas designated for conservation. The site of the proposed development is situated just over 100 metres south of the Lower River Shannon SAC, the River Shannon & River Fergus estuaries SPA and the Inner Shannon Estuary – South Shore pNHA (Site Codes 002165/004077/000435). The following is an extract from the NPWS site synopsis.

"The River Shannon SAC is a very large site which stretches along the Shannon valley from Killaloe to Loop Head/ Kerry Head, a distance of some 120 km. The site thus encompasses the Shannon, Feale, Mulkear and Fergus Estuaries, the freshwater lower reaches of the River Shannon (between Killaloe and Limerick), the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head.

The site is a candidate SAC selected for lagoons and alluvial wet woodlands, both habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for floating river vegetation, Molinia meadows, estuaries, tidal mudflats, Atlantic salt meadows, Mediterranean salt meadows, Salicornia mudflats, sand banks, perennial vegetation of stony banks, sea cliffs, reefs and large shallow inlets and bays all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive – Bottle-nosed Dolphin,

Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Atlantic Salmon and Otter.

The Shannon and Fergus Estuaries support the largest numbers of wintering waterfowl in Ireland. The highest count in 1995-96 was 51,423 while in 1994-95 it was 62,701. Species listed on Annex I of the E.U. Birds Directive which contributed to these totals include: Great Northern Diver (3; 1994/95), Whooper Swan (201; 1995/96), Pale-bellied Brent Goose (246; 1995/96), Golden Plover (11,067; 1994/95) and Bar-tailed Godwit (476; 1995/96). In the past, three separate flocks of Greenland White-fronted Goose were regularly found but none were seen in 1993/94.

A number of species listed on Annex I of the E.U. Birds Directive breed within the site. These include Peregine Falcon (2-3 pairs), Sandwich Tern (34 pairs on Rat Island, 1995), Common Tern (15 pairs: 2 on Sturamus Island and 13 on Rat Island, 1995), Chough (14-41 pairs, 1992) and Kingfisher. Other breeding birds of note include Kittiwake (690 pairs at Loop Head, 1987) and Guillemot (4010 individuals at Loop Head, 1987)."

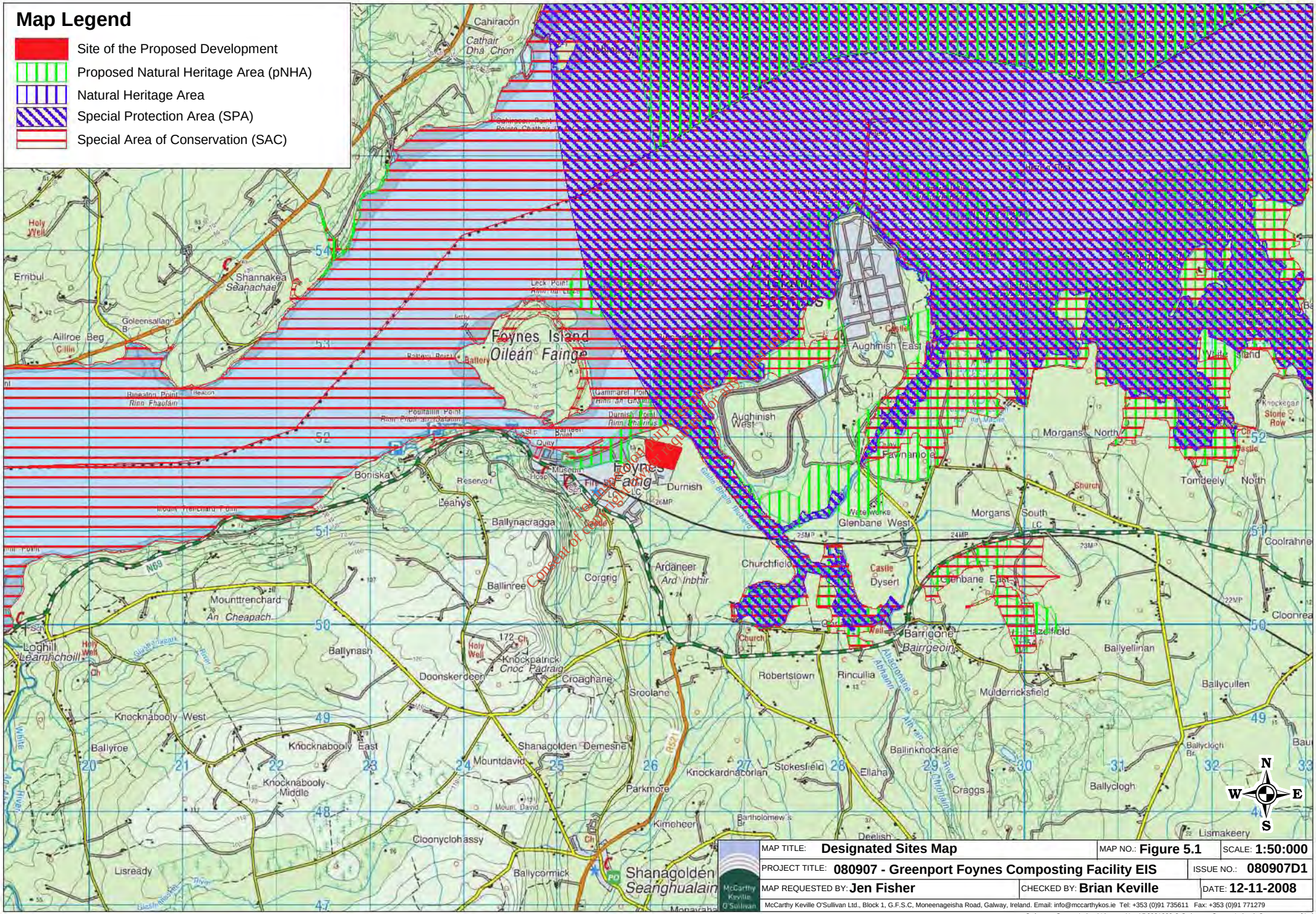
Two other designated areas are present within a five-kilometre radius of the proposed development site, Barrigone SAC/NHA (Site code 000432) and Sturamus Island pNHA (Site code 001436). Barrigon SAC/NHA is situated approximately 3 kilometres south east of the site of the proposed development and is a species rich calcareous grassland. Sturamus Island is situated 14 kilometres north of the site of the proposed development and is a small islet with a colony of nesting Terns and Gulls. The relationship of the site of the proposed development to these designated sites is shown in Figure 5.1. Figure 5.2 shows a closer view of the map showing the distance to Lower River Shannon SAC. The NPWS site synopses for these designated sites are shown in full as Appendix 7 of this EIS.

5.2.4.2 New Flora Atlas

A search was made in the *New Atlas of the British & Irish Flora* (Preston *et al.*, 2002) to find out if any rare or unusual plant species had been recorded in the ten kilometre square R25 (within which the site of the proposed development is located) during the 1987 – 1999 atlas survey carried out by the Botanical Society of the British Isles (BSBI). The search included the vascular plants that are listed in Annex II of the EU Habitats Directive, the Flora (Protection) Order of 1999 and the 6 nationally rare, scarce or Irish Red Data Book species mentioned in the NPWS site synopsis for the Lower River Shannon SAC. No species listed in Annex II of the Habitats Directive were recorded in R25 during the survey. Three Flora Protection Order Species were recorded in R25 during the atlas survey, Meadow Barley (*Hordeum secalinum*), Round Prickly Headed Poppy (*Papaver hybridum*) and Hairy Violet (*Viola hirta*). The scarce species Hard Grass (*Parapholis strigosa*) was also recorded in square R25.

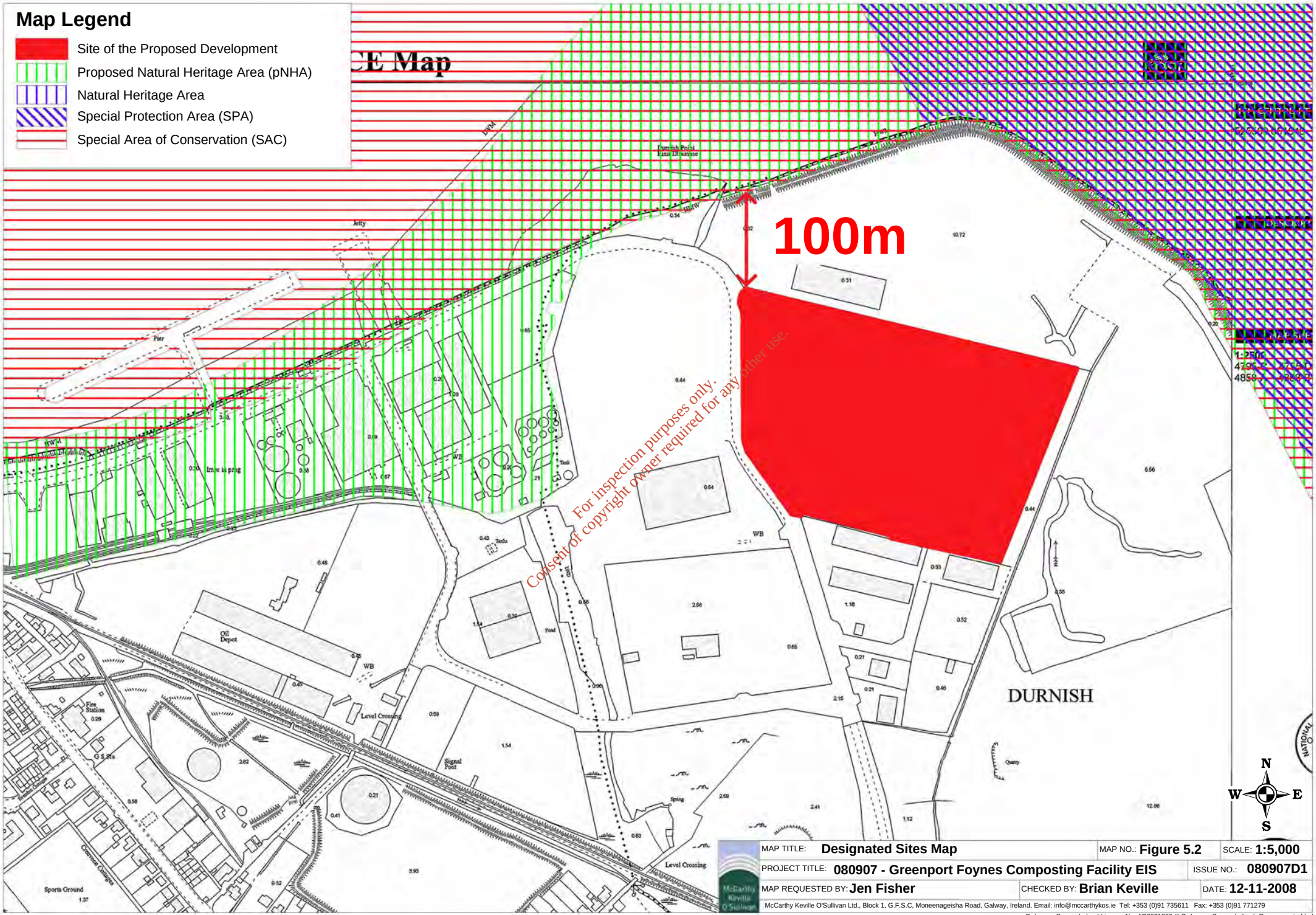
Round Prickly-headed Poppy – All of the records for Round Prickly-headed Poppy in the atlas were recorded before 1986. This plant is found in arable habitats and disturbed areas and is restricted to calcareous soils. Meadow Barley is found on unimproved or semi-improved grassland and roadsides. Meadow barley shows a strong preference for clay soils. Hairy Violet is found on calcareous grassland and open scrub habitats also on railway embankments and roadsides.

Hard Grass is found on open areas of waste ground by the sea or on salt marches.



MAP TITLE: **Designated Sites Map**	MAP NO.: **Figure 5.1**	SCALE: **1:50:000**
PROJECT TITLE: **080907 - Greenport Foynes Composting Facility EIS**		ISSUE NO.: **080907D1**
MAP REQUESTED BY: **Jen Fisher**	CHECKED BY: **Brian Keville**	DATE: **12-11-2008**

McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C, Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611 Fax: +353 (0)91 771279



MAP TITLE: **Designated Sites Map**		MAP NO.: **Figure 5.2**	SCALE: **1:5,000**
PROJECT TITLE: **080907 - Greenport Foynes Composting Facility EIS**			ISSUE NO.: **080907D1**
MAP REQUESTED BY: **Jen Fisher**	CHECKED BY: **Brian Keville**		DATE: **12-11-2008**

McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C, Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611 Fax: +353 (0)91 771279

5.2.4.3 Breeding Bird Atlases

The principal published sources of information regarding the distribution of breeding birds in Ireland are '*The Atlas of Breeding Birds in Britain and Ireland* (Sharrock, 1976) and '*The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991*' (Gibbons *et al.*, 1993). Similarly, *'The Atlas of Wintering Birds in Britain and Ireland'* (Lack, 1986) is the most comprehensive work on wintering birds in Ireland. However, it should be remembered that, for some species at least, more recent work has been carried out.

These atlases show data for breeding and wintering birds respectively in individual 10 km by 10 km squares. Table 5.1 shows those species found in the relevant ten-kilometre square, R25, which are recorded in the Breeding Birds atlases and are also protected under the EU Birds Directive or mentioned on the Birds of Conservation Concern in Ireland (BoCCI) red list. Birds listed under Annex I are offered special protection by the EU Birds Directive. Those listed on the BoCCI red list meet one or more of the following criteria:

- Their breeding population or range has declined by more than 50% in the last 25 years
- Their breeding population has undergone significant decline since 1900
- They are of global conservation concern

Table 5.1 Breeding Bird Atlas Data (R25)

Common Name	Scientific Name	Breeding Atlas 68-72	Breeding Atlas 88-91	Annex I	BoCCI Red List
Corncrake	*Crex crex*	Confirmed Breeding	Possible Breeding	Yes	Yes
Lapwing	*Vanellus vanellus*	Probable Breeding	Probable Breeding	No	Yes
Curlew	*Numenius arquata*	Probable Breeding	Breeding evidence	No	Yes
Yellowhammer	*Emberiza citrinella*	Confirmed Breeding	Present no Breeding Evidence	No	Yes
Common Tern	*Sterna hirundo*	Confirmed Breeding	Breeding evidence	Yes	No
Little Tern	*Sterna albifrons*	Confirmed Breeding	-	Yes	No
Herring Gull	*Larus argentatus*	Confirmed Breeding	-	No	Yes
Sandwich Tern	*Serna sandvicensis*	-	Breeding evidence	Yes	No
Arctic Tern	*Sterna paradisaea*	-	Breeding evidence	Yes	No
Barn Owl	*Tyto alba*	Confirmed Breeding	-	No	Yes
Peregrine	*Falco peregrinus*	Centred Record	-	Yes	No
Corncrake	*Crex crex*	Confirmed Breeding	Possible Breeding	Yes	Yes

- not recorded

Six species listed under Annex I of the EU Birds Directive have been recorded within the relevant ten-kilometre square in the Atlas of Breeding Birds; they are Corncrake, Common Tern, Little Tern, Sandwich Tern, Arctic Tern and Peregrine. Corncrake distribution has declined dramatically throughout Ireland in recent times. The decline of this species is largely attributed to earlier cutting of grass, which is associated with modern farming practices. This bird is known to breed in damp hay meadows (with tall grasses) and wet marshland. According to the 1993 Birdwatch Ireland/RSPB Corncrake Census Survey carried out in 1993 there has been an 80% decline in the population since the last atlas survey in 88-91. According to this study corncrakes are concentrated in four main areas these are the Moy Valley Co. Mayo, the Shannon Callows in the Midlands, North Donegal and the Erne Catchment in Fermanagh. Corncrakes are thus unlikely to occur at this site in Co. Limerick.

Common Terns, Little Terns, Sandwich Terns and Arctic Terns breed on shingle beaches and rocky islets. Common Terns also occasionally nest inland on gravel pits or reservoirs. No suitable habitats for nesting terns was recorded at the site of the proposed development. The records for Peregrine are centred in order to protect these birds from persecution during there breeding season. For this reason it is unknown weather Peregrine have been recorded in R25 or not. Peregrine breeds on cliffs on the coast or inland, and are unlikely to occur at the site of the proposed development.

The following birds have all have also been recorded in the Atlases of Breeding Birds and are included on the BoCCI red list; Herring Gull, Curlew, Lapwing, Yellowhammer, and Barn Owl. Herring Gulls breed on cliffs, coastal islands or on the islands of large lakes. No suitable habitat for nesting Gulls was recorded on the site of the proposed development. Curlew breed in a variety of habitats including bogs, arable fields and maritime grassland. Lapwing breeds on grassland habitats, preferring rough grassland or arable fields, which offer some cover. Neither of these waders are likely to breed on the site of the proposed development due to unsuitable habitat. Yellowhammer have a preference for arable habitats with some scrub or hedgerow, and are unlikely to occur at the site of the proposed development. Barn Owls prefer open farmland and parkland for hunting and are unlikely to be found at the site of the proposed development.

In terms of wintering birds, Table 5.2 shows those species found in the ten-kilometre square R25 that are recorded in the Atlas of Wintering Birds in Britain and Ireland 1988-91 and are also protected under the EU Birds Directive or mentioned on the Birds of Conservation Concern in Ireland (BoCCI) red list.

Nine birds recorded as wintering in the relevant ten-kilometre square are protected under Annex I of the EU Habitats Directive: Greenland White Fronted Goose, Golden Plover, Kingfisher, Hen Harrier, Bar Tailed Godwit, Bewick's Swan, Whooper Swan, Peregrine and Short Eared Owl. Bar Tailed Godwit feed on sandy muddy shores. No suitable habitat for Bar Tailed Godwit was recorded at the site of the proposed development. Greenland White Fronted Geese feed on a variety of habitats including improved grassland, stubble, winter cereal, bogs, turloughs and saltmarsh and are unlikely to occur at the site of the proposed development due to unsuitable habitat. Golden Plover have a preference for feeding on arable pasture during winter; this habitat was not present at the site. Kingfisher need access to still, slow flowing water for fishing and are unlikely to occur on the site as there is no standing water present.

Hen Harriers winter in large open areas suitable for hunting during the winter and are unlikely to occur on the site of the proposed development due to the industrial

nature of the site. Peregrine occur in a wide variety of habitats in winter and may hunt in the vicinity of the site. Whooper Swan and Bewick's Swan use a variety of habitats from small lakes and ponds to agricultural land, turloughs and intertidal areas where they graze on grass and winter cereals. No suitable habitats for swans was recorded on the site of the proposed development. Short Eared Owl is most likely to be found on farmland or on saltmarsh habitats in Ireland during the winter these habitats are not found at the site of the proposed development.

Table 5.2 Wintering Bird Atlas Data (R25)

Common Name	Scientific Name	Number Range	Annex I	BoCCI Red List
Greenland White Fronted Goose	*Anser albifrons flavirostris*	1-12	Yes	No
Golden Plover	*Pluvialis apricaria*	496+	Yes	No
Lapwing	*Vanellus vanellus*	1501+	No	Yes
Curlew	*Numenius arquata*	210+	No	Yes
Yellowhammer	*Emberiza citrinella*	1-25	No	Yes
Kingfisher	*Alcedo atthis*	1	Yes	No
Hen Harrier	*Circus cyaneus*	1	Yes	Yes
Shoveler	*Anas clypeata*	35+	No	Yes
Black-headed Gull	*Larus ridibundus*	381-1490	No	Yes
Herring Gull	*Larus argentatus*	1-70	No	Yes
Twite	*Carduelis flavirostris*	1-15	No	Yes
Bar Tailed Godwit	*Limosa lapponica*	19-175	Yes	No
Knot	*Calidris canutus*	1-32	No	Yes
Bewick's Swan	*Cygnus columbianus*	1-8	Yes	No
Whooper Swan	*Cygnus cygnus*	10-32	Yes	No
Pintail	*Anas acuta*	1-3	No	Yes
Peregrine	*Falco peregrinus*	1	Yes	No
Short Eared Owl	*Asio flammeus*	2-3	Yes	No

Nine birds listed on the BoCCI red list are recorded as wintering in the relevant ten-kilometre square (R25); these were Shoveler, Pintail, Black-headed Gull, Herring Gull, Lapwing, Curlew, Twite, Knot and Yellowhammer. Twite and Knot are predominantly coastal species during winter and are unlikely to be found on this site, which is over 100 metres inland. Shoveller usually winter on shallow eutrophic lakes, while pintail prefers esturine habitats. Neither of these ducks are likely to use the site of the proposed development.

Black-headed Gulls winter in a wide variety of habitats including urban areas, agricultural land, arable land and coastal habitats. Herring Gulls are concentrated in coastal area and densely populated areas during the winter. Both Black-headed Gulls and Herring Gulls may be found in the vicinity of the site during the winter. Lapwing and Curlew are unlikely to use the site of the proposed development during winter, they may however use the fields to the east of the site. Yellowhammer have a preference for arable land with some scrub or hedgerow. These habitats were recorded at the proposed development site.

5.2.4.4 NPWS Records

The NPWS records of protected species in the area of the proposed development were obtained for the relevant ten-kilometre square. Meadow Barley (*Hordeum secalinum*), Round Prickly Headed Poppy (*Papaver hybridum*) Great Burnet

(*Sanguisorba officinalis*) and Hairy Violet (*Viola hirta*) were all recorded within the relevant 10 kilometre square R25. All of these plants are discussed in section 5.2.2.2 above with the exception of Great Burnet. Great Burnet is found on a range of habitats including meadows, pastures, flushes and heaths. None of these habitats are found at the site of the proposed development.

5.2.5 Consultation

A scoping report providing details regarding the site of the proposed development, the proposed facility, and the methodology to be employed in surveying the site, was prepared by McCarthy Keville O'Sullivan Ltd. and sent to a number of consultees for comment including the Development Application Unit of the Department of the Environment, Heritage and Local Government (DoEHLG), the Heritage Officer of Limerick County Council, the EPA and the Shannon Regional Fisheries Board. Chapter 2 of this EIS provides further details of the scoping and consultation carried out as part of this assessment. Copies of all scoping responses received are set out in Appendix 1.

At the date of writing this report, two scoping responses relevant to the ecology of the site had been received. The recommendations of the Heritage Officer of Limerick County Council included:

- The development should take into account the presence of the nearby SAC site in terms of pollution mitigation measures during the construction and operation phases.
- The lighting associated with the development to be designed and orientated so as to prevent excessive light spill on to the estuary, in order to minimise disturbance to any wildfowl that might be using the estuary.

The scoping response from the Development Applications Unit of the DoEHLG set out the nature conservation recommendations of the National Parks & Wildlife Service (NPWS). The letter stated that an appropriate assessment of the impacts of the proposed development on the River Shannon SAC and the River Shannon and River Fergus Estuaries SPA would be required. The results of the appropriate assessment are set out in Appendix 8 of this EIS.

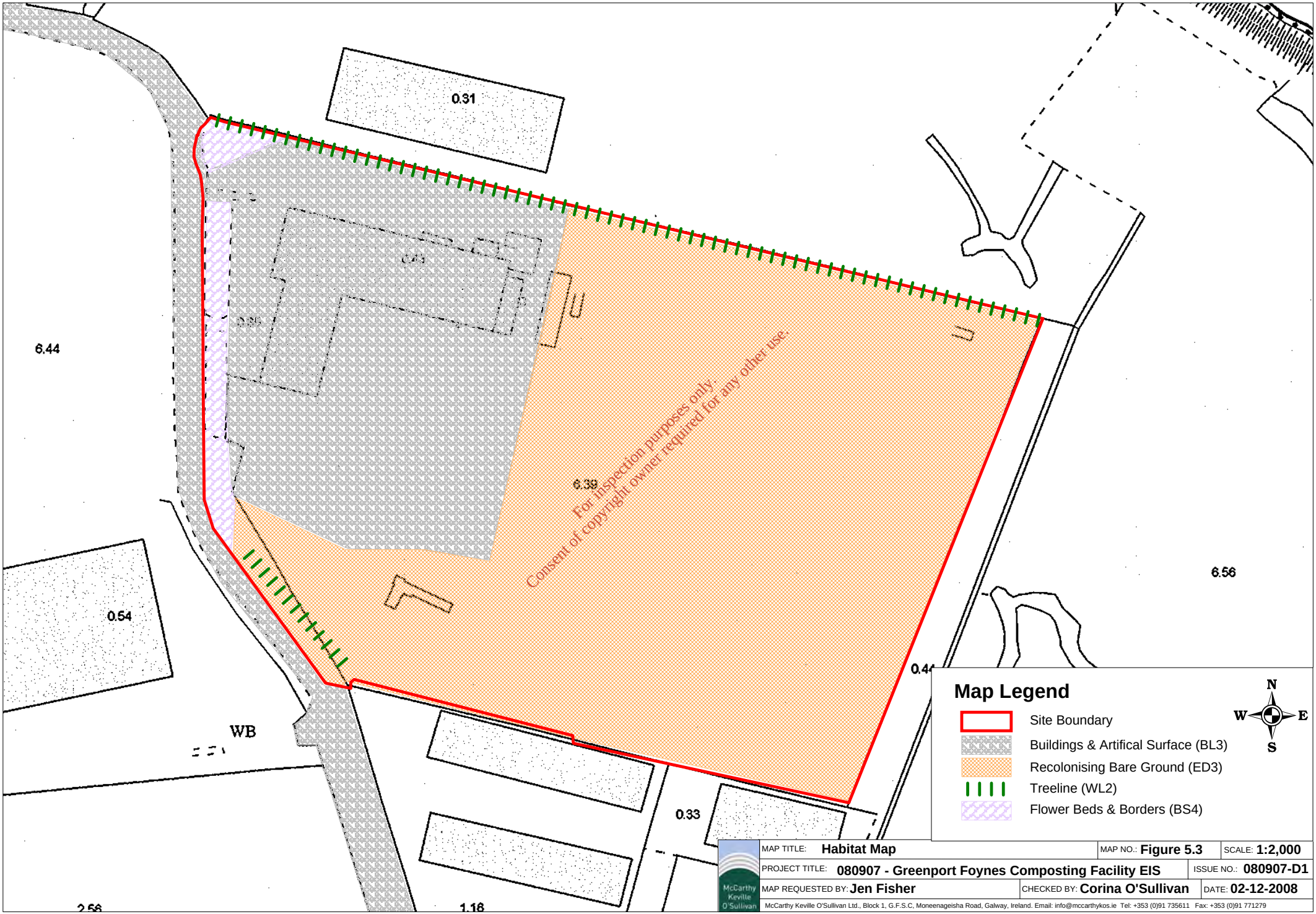
5.3 Flora in the Existing Environment

5.3.1 Habitats Present

Habitats present on the site of the proposed development were classified according to the guidelines set out in *'A Guide To Habitats in Ireland'* (Fossitt, 2000). The habitats present are shown on a Habitat Map, Figure 5.3. The habitats recorded on or adjacent to the site of the proposed development are listed below. The habitat names are followed by their corresponding habitat reference code (in brackets).

- Treelines (**WL2**)
- Buildings and Artificial Surfaces (**BL3**)
- Recolonising Bare Ground (**BC1**)
- Flower Beds and Borders (**BC4**)

The site covers a total area of approximately 7 hectares that is bounded on the western side by the existing access road. The site is surrounded to the north, south and west by heavy industry (Plate 5.1) and to the east by agricultural fields (Plate 5.2).



MAP TITLE: **Habitat Map**		MAP NO.: **Figure 5.3**	SCALE: **1:2,000**
PROJECT TITLE: **080907 - Greenport Foynes Composting Facility EIS**			ISSUE NO.: **080907-D1**
MAP REQUESTED BY: **Jen Fisher**	CHECKED BY: **Corina O'Sullivan**		DATE: **02-12-2008**

McCarthy Keville O'Sullivan Ltd., Block 1, G.F.S.C, Moneenageisha Road, Galway, Ireland. Email: info@mccarthykos.ie Tel: +353 (0)91 735611 Fax: +353 (0)91 771279

The site has been used for industry in the past and is not in its natural state. The main habitats on site are buildings and artificial surfaces and recolonising bare ground.

5.3.1.1 Buildings & Artificial Surfaces (BL3)

The western section of the site is dominated by a very large industrial/warehouse building, entrance road and areas of hardstanding. The walls and roof of the warehouse were corrugated (Plate 5.3). No plants were recorded on the building or on the hard standing surrounding the building.

5.3.1.2 Recolonising Bare Ground (ED3)

The majority of the site has been classified as Recolonising Bare Ground (Plate 5.4). This area was gravelled over at some time in the recent past and has become colonised by a large number of herbaceous plants. This area had a rich herb flora. Some of the species recorded in this habitat were Ragwort (*Senecio jacobaea*), Pineappleweed (*Matricaria matricarioides*), Groundsel (*Senecio vulgaris*), Creeping Bent (*Agrostis stolonifera*), Canadian Fleabane (*Conyza Canadensis*), Rough Hawk's Beard (*Crepis biennis*), Dove's-foot Crane's-bill (*Geranium molle*), Mouse Ear Hawkweed (*Pilosella officinarum*) and Hedge Mustard (*Sisymbrium officinale*). Towards the west of the site there is a higher cover of vegetation and an abundance of rank grasses such as Yorkshire Fog (*Holcus lanatus*), Crested Dogs-tail (*Cynosurus cristatus*) and Cock's-foot (*Dactylis glomerata*).

5.3.1.3 Treelines (WL1)

The entire length of the northern boundary is marked by a Cypress treeline. These trees were densely planted and were approximately 7 metres high (Plate 5.3). A few small beech (*Fagus sylvatica*) saplings were recorded in the western end of the treeline. A second treeline was recorded in the south west of the site. These trees were more mature and situated further apart. All of the trees were Ash (*Fraxinus excelsior*). Many of the trees had been pollarded and several were standing deadwood. The majority of these trees were in poor condition. A few hawthorns were also recorded in this area (Plate 5.5).

5.3.2 Species Present

A full list of the vascular plant species recorded during the site visits is presented in Appendix 9 to this EIS. None of the species that were recorded on the site visit are considered to be of conservation importance.

5.3.3 Character of Habitats

The site contains a number of habitats as outlined above. None of the habitats are in their natural state, having been altered or created by industrial activity. The site has not been managed in some time and coloniser plants have become established on areas that were formerly hard-standing. The treelines on site add little habitat diversity, since they are composed of non-native species or are in poor condition. Overall the character of the site is one of abandoned industry.

5.3.4 Significance of Habitats

None of the habitats recorded on the site of the proposed development are protected under Annex I of the EU Habitats Directive. The site consists primarily of Buildings and Artificial Surfaces, recolonising bare ground and treelines. These habitats are known to be of low ecological significance and are plentiful in the local area.

Plates

Plate 5.1. Showing heavy industry to the west in the background and flowerbeds and borders in the foreground.

Plate 5.2. View of Agricultural land to the east of the site of the proposed development

Plate 5.3. Showing the buildings in the western section of the site and the treeline on the northern boundary

Plate 5.4. Showing an area of recolonising bare ground

Plate 5.5. Showing a section of the treeline, the tree to the right is standing deadwood

5.4 Fauna in the Existing Environment

5.4.1 Birds

Table 5.3 shows the nine bird species recorded within and adjacent to the site during the site visit on 19th November 2008. Records were taken of bird species seen or heard. The bird species recorded were typical of the habitat types found on the site, built up areas, treelines and adjacent agricultural land. Of the bird species recorded, two are listed on the Birds of Conservation Concern in Ireland (BoCCI) red list: Black-headed Gull which was recorded flying over and Curlew which was recorded immediately east of the site. Black-headed Gull breeding populations have declined >50% and its breeding range has declined >70% for this reason this species has been newly added to the BoCCI Red list. Curlew are red listed due to a decline in their breeding range. All the other birds are green listed i.e. have favourable conservation status.

Table 5.3 Bird species recorded within the site during visit

Common Name	Scientific Name	Conservation Status
Chaffinch	*Fringilla coelebs*	Green Listed
Jackdaw	*Corvus monedula*	Green Listed
Pied Wagtail	*Motacilla alba yarrelli*	Green Listed
Woodpigeon	*Columba palumbus*	Green Listed
Curlew	*Numenius arquata*	Red Listed
Magpie	*Pica pica*	Green Listed
Black-headed Gull	Larus ridibundus	Red Listed
Hooded Crow	Corvus cornix	Green Listed
Blackbird	Turdus merula	Green Listed

5.4.2 Mammals

The only Mammal that was directly observed within the site during the visit was Irish Hare (*Lepus timidus hibernicus*). A group of 4 Leverets were observed on several occasions on the site. In addition an abundance of Hare droppings was recorded. Badger (*Meles meles*) faeces and Scuffle marks were recorded in several locations in the eastern section of the site. There was, however, no evidence of Badger habitation, and indeed the ground conditions were very unsuitable for burrowing on the site. A single fox (*Vulpes vulpes*) dropping was recorded on the track between the two arable fields.

Other mammal species such as Rabbit (*Oryctolagus cuniculus*), Wood Mouse (*Apodemus sylvaticus*), Pygmy Shrew (*Sorex minutus*), Brown Rat (*Rattus norveigicus*), and Stoat (*Mustela erminea*) may also be present, on occasion.

The buildings on site were not considered to be suitable bats roosts since they were largely composed of corrugated walls and roofs. Two of the trees in the treeline were standing deadwood, these trees may have suitable cavities for roosting bats, however the poor quality of surrounding habitat reduces the roost potential of these trees. The site itself is quite open and unlikely to provide major foraging or commuting habitats for bats. The treeline on the northern section of the site appears to be suitable for bats commuting through the site. Despite this, a low number of bats would be expected to use this commuting route due to the poor quality of the habitat in the surrounding area. All bats are protected under Annex IV of the EU Habitats Directive.

5.5 Significance of the Fauna

None of the species recorded on site are protected under Annex II of the EU Habitat Directive. Given the nature of the site and its habitats, the associated fauna would be expected to be of low ecological significance. Although evidence of Badger and Irish Hare was recorded on site, the site itself is not expected to support these species during the breeding season and these mammals are thought to be occasional visitors to the site.

Irish Hare was recorded on site and is listed in Annex V of the EU Habitats Directive and in Appendix III of Bern Convention (Council of Europe, 1979). The Irish population is also listed in the Irish Red Data Book as being of international importance (Whilde, 1993). This hare is the Irish subspecies of the Mountain Hare, which has a circumpolar distribution. Irish Hare are found in many habitats in Ireland from the coast and dune systems, all types of pasture and peatlands to heather moorland. Although there is no reliable estimate of the Irish population of this species (Hayden and Harrington, 2000), it is widespread and frequently encountered. Badgers faeces and scuffle marks were recorded on site indicating that Badgers use the site for feeding at least on occasion. Badgers are protected under Article 20 of the 1976 Wildlife Act (Bern Convention).

The site offers limited potential for bat feeding habitats and commuting routes. With the exception of two standing dead trees none of the trees are mature enough to contain cavities suitable for roosting bats. All Bats are protected under Annex IV of the EU Habitats Directive, except Lesser Horseshoe Bat, which is protected under Annex II. The conditions on site were not suitable for Lesser Horsehoe Bats as they prefer closed canopy woodland habitats.

Two species of birds recorded in the vicinity of the site of the proposed development are listed on the Birds of Conservation Concern in Ireland - Red List, these are

Curlew and Black-headed Gull. Black-headed Gulls breed in large colonies in large reedbeds, marshlands or on islands in lakes. Black headed Gull was recorded flying over the site. This bird was recorded flying north east in the direction of the Shannon Estuary. It is unlikely that Gulls are breeding on or near the site of the proposed development due to unsuitable habitat. Curlew breed in a variety of habitats including bogs, arable fields and maritime grassland, Curlew were recorded flying to the east of the site of the proposed development and are likely to use these fields adjacent to the site for feeding due to the close proximity to the estuary. The site of the proposed development itself is an unsuitable feeding habitat as the entire site was hard standing that has become overgrown with coloniser plants.

5.6 Likely and Significant Impacts on Flora and Fauna and Associated Mitigation Measures

5.6.1 Do Nothing' Impact

If the proposed development does not go ahead it is likely that the area will continue to be unmanaged. This being the case, the area of recolonising bare ground will become grassland in the short term and scrubland in the longer term. The industrial buildings are likely to fall into ruin in the long term. The treelines around the site will mature. The fauna of the site is likely to remain largely as it is at present at least in the short term.

5.6.2 Impacts During Preparation and Construction Phases

5.6.2.1 Impacts on Flora and Fauna

5.6.2.1.1 Permanent Slight Negative Impact

Areas of habitat within the footprint of the proposed development include buildings & artificial surfaces and recolonising bare ground. The proposed development will result in the permanent loss of these habitats within the construction footprint. These habitats are of low ecological significance and the resultant impact is considered to be slight.

Mitigation
No mitigation.

5.6.2.1.2 Short term Slight Negative Impact

During the construction phases of the development, there may be some disturbance to vegetation outside the footprint of the development. This may be caused by construction traffic or by the use of vegetated areas for storage. This impact is considered slight based on the species identified during fieldwork.

Mitigation
No mitigation.

5.6.2.1.3 Short-term Moderate Negative Impact

Noise and disturbance during the construction phase may disturb some of the fauna on the site and adjacent to the site of the proposed development. Irish Hare and Badger activity was recorded on the site of the proposed development. However, the site is unlikely to provide suitable habitat for these mammals during the breeding season due to the sparse cover and compacted ground conditions. These mammals are likely to move into superior adjacent habitats to the east during these periods. Similarly the fields to the east of the site are likely to support feeding Curlew.

Mitigation
A line of Alder trees will be planted along the eastern boundary of the site to screen off adjacent areas of habitat thought to be used by feeding Curlew and Irish Hare. Native trees such as Alder are known to support more wildlife than non-native species. In addition alder are fast growing species that would provide screening sooner.

5.6.2.2 Impacts on Water Quality

5.6.2.2.1 Short-term Moderate Negative Impact

The use of vehicles on the construction site gives the potential for the spillage of fuel and oil on the site either from leaks from vehicles or fuel tanks or spillages. These substances may leach down into the soil, subsoil and groundwater and eventually contaminate surface waters.

Mitigation
All machinery used during the construction works will be checked and maintained to avoid leaks of fuel, lubricants etc. Best practice for machinery management on construction sites will be adopted.

A concrete hard standing surrounds the entire building and the extension will be laid on existing hard standing area. Class 1 oil interceptors will be installed on the storm water lines servicing these hard standing areas in the initial stage of the project to ensure the construction phase does not impact on ground or surface water quality.

All refueling activities will take place in a designated refueling area. All fuel on the site will be stored in double skinned (bunded) tanks in the designated fuel areas.

5.6.3 Impacts during the Operational Phase

5.6.3.1 Impacts on Flora and Fauna

5.6.3.1.1 Long-term Slight Negative Impact

The proposed development will increase traffic and activity in the area, thus increasing disturbance of wildlife including birds (e.g. Curlew) and mammals (E.g. Irish Hare and Badger) using the site and adjacent areas. However as the site of the proposed development is within an industrial zone that is already subject to moderate volumes of traffic, this impact is considered to be slight.

Mitigation
As mentioned above in section 5.4.2.1, a line of Alder trees will be planted along the eastern boundary of the site to screen off adjacent areas of habitat. A stock-proof fence will also be erected around the facility in line with the DAFF requirements for composting/biogas facilities.

5.6.3.1.2 No Impact

A lighting plan for the proposed development site has been prepared. 19 No. AKTRA 600w High Pressure Sodium (HPS) floodlights will light the interior of the site. The lux levels shown on Figure 3.14 in Chapter 3 of the EIS show that there will be no significant light spill outside the proposed development site.

Mitigation
The external lighting will avoid disturbance to wildlife and no lighting will be focused on areas of ecological sensitivity. The alder treeline that will be planted on the eastern perimeter of the site will also protect against light spill to the east.

5.6.3.1.3 Neutral Impact

No lighting is expected to spill onto the estuary as the development is over 100 metres inland. In addition the tree-line on the north side of the site and a building north of the site provides good screening which will prevent light from the facility from spilling on to the estuary. Thus there will be no visual impact on the estuary.

Mitigation
No mitigation.

5.6.3.2 Impacts on Water Quality

5.6.3.2.1 Short-term Moderate Negative Impact

The use of vehicles delivering municipal waste to the compost facility increases the potential for the spillage of fuel and oil on the site either from leaks from vehicles or fuel tanks or spillages. These substances may leach down into the soil, subsoil and groundwater and eventually contaminate surface waters.

Mitigation
All refuelling activities will take place in a designated refuelling area. The refuelling area will be contained and under cover. The fuel storage area will be bunded to 110% of the total volume. Only permanent vehicles on site will be refuelled on site, vehicles delivering/collecting materials will not be refuelled on site.

Residual Impact – Short-term Slight to Imperceptible Negative Impact
The mitigation will reduce the magnitude of this impact from moderate to slight or imperceptible.

5.6.3.2.2 Potential Long-term Significant Impact

There is the potential for an increased surface water run-off if vehicles are to be washed out on site. Similarly stormwater falling on hardstanding areas has the potential to pick up contaminants. This wastewater could have a significant negative impact on groundwater or surface water if discharged untreated.

Mitigation
In the event that a vehicle requires cleaning, the vehicle will be steam cleaned within the confines of the building and any wastewater generated will be contained and reused within the process. There will be no emissions of process wastewater from the facility. This will ensure compliance with the Department of Agriculture requirements and the EPA requirements. As a precaution, external surfaces will discharge to a Class 1 silt trap/oil interceptor.

There will be no discharges of environmental significance from the facility. All process wastewater generated will be contained in wastewater tanks and reused in the process. There will therefore be no process discharges off-site to ground or surface water.

Residual Impact – Short-term Slight to Imperceptible Negative Impact
The vehicles will not be washed out but will be steam cleaned within the building and wastewater will be used within the process. As a result there will be no discharge of

wastewater from the facility. Thus the magnitude of this impact will be reduced from moderate to slight or imperceptible.

5.6.3.2.3 Potential Short-term Significant Impact

The development will lead to the production of foul sewage and grey water from staff facilities. Sewage and wastewater could have a significant negative impact on groundwater if discharged untreated.

Mitigation

Wastewater from staff facilities will be discharged to and processed by an onsite Puraflow (or equivalent) wastewater treatment unit prior to discharge to an existing sewer outside the facility. Emission limits for the discharge of treated effluent from the onsite wastewater treatment unit will be assigned by the EPA as part of the waste licencing proces for the facility. The treated effluent will discharge to the Shannon estuary via an existing outfall provided as part of the contract for an adjacent facility. Following discussions between Greenport Environmental Ltd. and the Shannon Foynes Port Authority, the connection from the onsite treatment unit will be made to this sewer, which is currently under construction on the Port Road. Further details regarding wastewater drainage are provided in Chapter 7 of this EIS.

6 GEOLOGY AND SOILS

6.1 Introduction

A new composting/biogas facility is proposed for a site in Foynes Harbour, Co. Limerick. The 17-acre site is currently occupied by an old warehouse used for coal storage and more recently for fertiliser and timber frame construction. There are associated concrete and hard standing areas.

This section of the Environmental Impact Statement (EIS) relates to geology and soils at the site. Detailed descriptions of the existing soils and geology are provided along with information on potential significant environmental impacts due to the proposed development.

6.2 Study Methodology

The sub-surface conditions were identified through the study of existing maps and reports, aerial photography and principally using accurate information from site investigations undertaken in the vicinity.

This section of the EIS has been prepared in accordance with Environmental Protection Agency Guidelines on EIS and adopts a grouped format. The following matters are addressed:

- Receiving Environment (Baseline Situation)
- Potential Impact of the Proposal
- Mitigating Measures
- Predicted and/or Residual Impacts
- Monitoring

6.3 Receiving Environment

The sub-surface conditions were identified through the study of existing maps and reports, aerial photography and detailed site investigation.

6.3.1 Topographical/Geomorphological Assessment

The topography and geomorphology of the site was assessed from OS Discovery Map Sheet 64. The topography of the proposed site is lowland/ estuarine floodplain. The site is 90 metres south of the river Shannon and 180 metres west of Robertstown River. Approximate ground level is 13 metres AOD.

Aerial photographs were studied and the site was a Brownfield site adjacent to the River Shannon. Fuel storage areas and timber yard processes were identified. There appeared to be a number of settlement ponds in the vicinity of the site. Historically the site was used as coal storage.

6.3.2 Published Data

The Geological Survey of Ireland (GSI) had not published any Quaternary data at the time of writing the EIS.

The Teagasc subsoil map for the area indicates the site may be underlain by marine or estuarine deposits with made ground in the west of the site.

The GSI Sheet 17 published in 1999 with associated memoir Geology of The Shannon Estuary indicates that the site may be underlain by the Carboniferous Durnish Formation. The information has been supplied by GSI reconnaissance over earlier detailed mapping. The stratigraphy was originally described by Shephard-Thorn (1963) and has subsequently been refined by Somerville and Jones (1985) and Strogen (1988) and Strogen et al. (1992 & 1996).

The Durnish Formation is broadly described as Dinantian Upper impure limestone with bioclastic calcarenites and black interbedded argillite. The limestone is typically a blue black/dark grey grainstone to wackestone with occasional interstitial argillaceous components or sulphate replaced micritic matrix. The beds are characterised by common black chert nodules or bands. The formation is fossiliferous with rugose coral. The overall orientation of bedding is 16 to 36 degrees west to northwest.

The GSI web mapping service indicates that the formation may be a locally important aquifer that is moderately productive. An interim assessment of the vulnerability for the formation had been carried out. There were no mapped karst features within the formation.

The site has been described by Radon Protection Institute of Ireland (RPII) as being a 'High Radon Risk'.

6.3.3 Factual Ground Investigation

The following assessment of the soils and geology on site has been made from the following detailed ground investigations.

- **Site-specific ground investigation carried out by Priority Geotechnical Ltd in June 2008 Report No. P805c.**
  Factual findings of the discrete intrusive ground investigation – see Appendix 10 of the EIS.

- **Report on the Geophysical Survey at Foynes, Co. Limerick in March 2009, Report No: AGL09005_01.**
  Factual findings and interpretation on non-intrusive geophysical surveying – see Appendix 11 of the EIS.

The extent of ground investigation is summarised in Table 6.1.

Table 6.1 Intrusive and Non-Intrusive Ground Investigation Summary

Investigation Components	Details
Trial Pits	22 No.
Rotary holes	5 No.
Rock Coring	4 No.
In situ strength testing	21 No.
Environmental Sampling	60 No.
Water Samples	4 No.
Environmental Laboratory Analysis	244 tests
Groundwater Monitoring	4 standpipes, 3 visits
Ground Gas Monitoring	8 standpipes, 3 visits
Conductivity Survey	Entire site
Resistivity Survey	6 profiles
Seismic refraction survey	6 profiles

The interpreted soil model from the above ground investigation is presented in Table 6.2.

Table 6.2 Summary of Stratigraphy

Stratum	Description	Max. Thickness (m)	Avg. Thickness (m)	Max. Depth to Base (m)
Fill	Very clayey sandy gravelly COBBLES and BOULDERS	2.45	0.9	2.45
Estuarine Deposits	Soft silty CLAY and dense SAND with PEAT	3.0	1.3	5
Glacial Soils	Stiff sandy gravelly CLAY with cobbles	3.0	0.7	8
Rock	Strong grey slightly weathered LIMESTONE & SHALE	>8.7	-	>10.4

Soils are neither vertically nor laterally persistent.

6.3.3.1 Made Ground

The made ground was likely placed as part of the original site build up or reclamation on top of the soft alluvial soils then topped with hard standing or concrete.

The hard standing comprises both concrete and hardcore. The levels on site were changed prior to 1991. Site build up comprises compacted fill. It was represented in the exploratory logs as a firm to very stiff slightly sandy, slightly gravelly CLAY with cobbles and boulders or a dense very clayey, sandy COBBLES and BOULDERS. It is not laterally persistent over the site but where present varies in thickness from 0.2 metres to 2.45 metres.

6.3.3.2 Alluvial Soils

This deposit was recovered as a soft to stiff blue grey to brown silty CLAY with occasional fine sand partings, sea shells, and peat. The deposit was also recovered as a dense brown/grey clayey gravelly fine to coarse grained SAND. The maximum recorded thickness of this deposit was 3 metres. The deposit averaged 1.3 metres.

6.3.3.3 Glacial soils

The glacial soils where present, were described as firm to very stiff sandy gravelly CLAY with sub angular to angular limestone cobbles and boulders. The deposit overlies the limestone bedrock.

6.3.3.4 Rock

The limestone was described as strong to extremely strong, dark grey, crystalline, bioclastic. The limestone is fresh to slightly weathered. Fractures are closely spaced and dip between 8 and 32 degrees. The fractures are rough and undulating with some clay smearing. The rock recovered from the rotary coring on site conforms to the published geology for the area. Some lengths of core were recovered as non-intact.

A geophysical survey was carried out in March 2009 by Apex Geoservices. Their results show that rockhead varies from 0.3 metres to 7 metres below ground level (bgl). The rockhead is shallow in the central and western part of the site and getting deeper in the

east. In the vicinity of the proposed development site rockhead is estimated to be 0.3 metres to 3.6 metres below ground level.

The survey indicates that rock may comprise moderately weathered and fractured limestone with shale. No significant karstification was found in the limestone although two anomalous areas were identified in the Resistivity surveying – these require further investigation but are expected to be associated with saline intrustion based on experience from adjacent sites.

6.3.4 Results of Environmental Analysis on the Receiving Geo-Environment

An environmental assessment on the site's soil, rock, water and ground gas was provided by the Environmental Consultant Mouchel Ltd. Mouchel Ltd designed and supervised the environmental aspect of the Ground Investigation, scheduled contamination testing and specified ground gas and water monitoring. Full details of their findings can be found in:

- **Phase 1 Geo-environmental Desk Study Report (797036/R/001) by Mouchel June 2008**
  (Preliminary assessment of historical use of site and potential impacts – see Appendix 12 of the EIS.)

- **Intrusive Ground Investigation Report (797036/R/Foynes/02) by Mouchel January 2009**
  (Assessment of EGI and laboratory results in terms of environmental liability – see Appendix 13 of the EIS.)

All soils encountered on site were analysed for contaminants. The Environmental testing carried out is presented in Table 6.3.

Table 6.3 Summary of Contamination Tests

Test
Total Petroleum Hydrocarbons
Asbestos Screening
Volatile Organic Compounds, VOC
Semi-VOC
Poly-Aromatic Hydrocarbons1, PAH
13 Metals2
Sulphate
Sulphur
PCBs
Waste Acceptance Criteria Suite

6.3.4.1 Basis for Analysis

The results were screened against Generic Assessment Criteria (GAC), derived by LQM (Land and Quality Management) and the Chartered Institute of Environmental Heath (CIEH)6 using CLEA UK, following guidance from the EA (Environment Agency) and DEFRA (Department for Environment Food and Rural Affairs). Remaining GACs were derived by Mouchel using CLEA UK and the same guidance. The most conservative GAC chemical determinant has been used to assess the worst-case scenario. This was also carried out for Volatile Organic Carbons (VOC)'s, semi VOCs and Polychlorinated biphenyls (PCBs) determinants.

6.3.4.2 Made Ground Analysis

Within the made ground there was one elevated contaminant recorded on site. The contaminant present in concentrations where the Chartered Institute of Environmental Health's Generic Assessment Criteria (CIEH GACs) for commercial use criteria was Total Petroleum Hydrocarbon (TPH) C10-C36. However, the most conservative determinant was used which was aromatic C5-C7 at 1% soil organic matter (SOM).

6.3.4.3 Groundwater Analysis

Groundwater results indicated elevated concentrations of selenium and free cyanide at boreholes to the east and north east of the site. However, selenium does not have an EQS (Environmental Quality Standard) and so is not viewed as a contaminant of concern in European groundwater.

The elevated levels were found in BH (boreholes) 103 and 104 and also in BH 102 – none of which are in locations that need foundation or pit excavations. Pumping is unlikely to be required for building foundations but will be required for leachate and intake pits.

6.3.4.4 Leachate Analysis

Leachate analysis revealed that the standard metal suite contaminants, which were present in the soil underlying the site, or had the potential to leach into groundwater exceeded screening values. The concentrations of these metals were recorded in many samples across the site, showing a need for further assessment. It was noted that the metals found were not identified in groundwater sampling and that the risk to adjacent lands and watercourses from the leachate is considered to be low.

6.3.4.5 Ground Gas Analysis

No elevated concentrations of ground gas were recorded during the monitoring. The monitoring undertaken was limited, however, it is extremely unlikely that risks in this context will be other than low.

6.4 Predicted Impact of the Proposed Development

A new composting facility is proposed for a site in Foynes Harbour, Co. Limerick. The 17 acre industrial site is currently occupied by an old warehouse and concrete slab. The site has previously been used for coal storage and more recently for fertiliser and timber storage. There are associated concrete and hard standing areas.

The proposed development will comprise industrial warehousing and hardstanding. The proposed foundation solution requires excavation down to rockhead. There will also be overburden excavation for infrastructure.

The assessment of the Environmental Consultant Mouchel Ltd. was that the site is suitable for its current use and proposed use assuming that the proposed development is as stated and will comprise mainly buildings and hard standing. However, should the site be redeveloped to include areas of soft landscaping or for a more sensitive end use it is recommended that further assessment is carried out.

6.4.1 Impacts on Soils

No significant impacts on the receiving environments Soils are anticipated. However the following impacts are presented in Table 6.4.

Table 6.4 Impact on Site Soils

No.	Impact	Affected	Mitigation Measure Required
1	Ground conditions	√	√
2	Stability	√	√
3	Interaction with Groundwater	√	√
4	Ability to grow plants	x	x
5	Capacity as organic filter	x	x
6	Modulator of the hydrologic cycle	√	x
7	Material Asset	x	x
8	Intrinsic scientific value / geological heritage	x	x

- Made ground and natural soils will be excavated for foundation level and to achieve finished site levels and will require suitable disposal.

- Groundwater is anticipated at 2 metres bgl (below ground level). Maximum excavation for foundations is 3.6 metres. Therefore sump pumps and gentle batters/trench boxes may be required locally to keep excavations stable. Sustained dewatering will induce settlement of the site and any adjoining sites due to reduced buoyancy of the soil. Elevated levels of selenium and free cyanide were found in boreholes to the east and northeast of the site. These are remote from the areas of deep excavation and while pumped groundwater will be monitored, and re-injected if required, as an alternative to controlled discharge to surface water drains.

- The elevated TPHs found on site are located within 0.6 metres bgl from the surface. Due to the close proximity to potential receptors; they are likely to be dermal, ingestion and inhalation risks for more sensitive site end-users.

- Elevated concentrations of metals were identified in leachate samples. None were encountered in the groundwater samples. However, the potential is there for such contaminant to leach into the groundwater. However, the underlying silt and clays may attenuate the contaminants.

Key identified potential receptors were:

- Future site users – human health risk
- Surrounding water courses including the Robertstown River
- Building Structures
- Groundwater abstractions (SPZ)

The site comprises mainly hard standing, thereby reducing the potential linkage between source and receptor.

6.4.2 Impacts on Geology

No significant impacts on the receiving environments geology are anticipated. However the following impacts are presented in Table 6.7.

Table 6.7 Impacts on Site Geology

No.	Impact	Affected	Mitigation Measure Required
1	Ground conditions	x	x
2	Stability	x	x
3	Interaction with Groundwater	√	√
4	Ability to grow plants	x	x
5	Capacity as organic filter	x	x
6	Modulator of the hydrologic cycle	x	x
7	Material Asset	x	x
8	Intrinsic scientific value / geological heritage	x	x

- The limestone was noted in published documentation as locally important aquifer with a low to high vulnerability rating. The saline intrusions into the aquifer reduce its importance. However, contaminants may permeate through the rock. If conditions remain the same with hard standing then it is unlikely that infiltration will facilitate the movement of these leachable contaminants

- No significant karst features were found on site, however, two anomalies were noted in the Resistivity survey that requires further investigation. These are likely, based on experience with adjacent sites, to be related to saline intrusion.

6.5 Remedial And Mitigation Measures

Based on the information available, the risk of contamination associated with the development of the site is considered low under SOURCE – PATHWAY – RECEPTOR risk assessment. However, the following mitigating measures are proposed in Section 6.5.1.

6.5.1 Proposed Mitigation Measures

Mitigation measures for the proposed impacts include the following:

- Where possible excavated soils will be reused on site to reduce spoil to land fill.
- The potential to contaminate groundwater will be mitigated by channelling run-off to drainage ditches for discharge to surface waters after attenuation to remove hydrocarbons, leachate and particulate contaminants
- Drainage will be sealed to prevent interaction with the underlying aquifer.
- Dewatering will be limited and re-injected where possible
- Site levels are to remain similar to the existing profile to limit potential settlement and disposal of unsuitable soils.
- Two additional rotary cores will be advanced to confirm the geophysical interpretation.

6.6 Predicted and/or Residual Impacts

There are no predicted environmental residual impacts on site's soils or geology.

6.7 Monitoring

Potential impacts on site soils and geology will be monitored and reassessed at regular intervals throughout the construction phase by means of site walkover and risk assessments. Also there will be continued monitoring of ground gas and leachate concentration in groundwater.

7 HYDROLOGY AND HYDROGEOLOGY

7.1 Introduction

This section of the Environmental Impact Statement describes the watercourses and aquifers at the site of the proposed development. The impact of the development on the watercourses and aquifers is discussed and evaluated. Mitigation measures are proposed, and the residual effects are described.

The site of the proposed development is located within the Foynes Port Area, in the townland of Durnish, on the southern side of the Shannon Estuary, Co. Limerick. The site measures 17.24 acres.

The site of the proposed development lies in proximity to the Lower River Shannon Special Area of Conservation (SAC) and Natural Heritage Area (NHA) and the River Shannon and River Fergus Estuaries Special Protection Area (SPA).

Existing land uses adjoining the site include coal/clinker storage (outdoor storage), engineering companies and other warehousing. The Aughinish Alumina Refinery is located approximately 2.4 kilometres northeast of the proposed development site.

7.2 Hydrology in the Existing Environment

7.2.1 Surface Water Features

The site is bounded to the north by a shallow open drain and to the east of the site there is an open drain which is routed through low-lying lands to a back drain which discharges to the Robertstown River and ultimately to the Shannon. The Robertstown Creek is fed from its tributaries, the Ahacorane River and Shanagolden Stream. The Robertstown Creek has tidal influence at the location of discharge from the back drain, which services the subject lands. The Ahacorane River is listed on EPA Water Quality database as having a Q value of 3 at the monitoring point (Bridge Southwest of Barrigone). This indicates that the river is moderately polluted at this location. Chemical Analysis provided for the River from 1998 to 2003 would also indicate that there are water quality issues at the sample location. The Shanagolden Stream is listed on the EPA Water Quality database as unpolluted at the closest sample point (Bridge Northwest of Stokesfield) although most recent available results indicate slightly polluted conditions. Extracts from the EPA Database are provided in Appendix 14.

The surface water from the site currently discharges via the open drain to the north and via a piped outfall through third party lands to the open drain to the east of the site.

The area immediatly east of the site is defined by the OPW as "Benefiting Lands" i.e. lands identified by the Office of Public Works as those that might benefit from the implementation of Arterial (Major) Drainage Schemes (under the Arterial Drainage Act 1945) and indicating areas of land subject to flooding or poor drainage. Extracts from the OPW database are provided in Appendix 15.

There is protection to the lower lying land to the east of the site by embankments to the Robertstown Creek and Shannon Esturary. The highest recorded tidal event at Foynes Port as recorded by OPW is 5.98 metres OD Poolbeg (3.27 metres OD Malin Head). This was recorded on 1st February 2002. Prior to this event the highest level experienced in 30 years

of monitoring was estimated as 3.1 metres OD Malin Head (Tony Cawley seminar National Hydrology Seminar 2001).

In accordance with the requirements of The Planning System and Flood Risk Management Guidelines (Draft) of September 2008, zones are to be defined for development sites. The zoning is established based on flood probabilities.

The extreme flood events are not fully defined for the Foynes area. The highest known event is of the order of a 40-year event at 3.27 metres OD Malin Head. Comparable frequency analysis for tidally affected locations (Limerick Docks) indicates that a 1 in 1000 event would be circa 500-600 mm above the 1 in 40 year flood event.

As the site is located at 3.68 metres above the 1 in 40 year flood event, it is reasonable to conclude that the area proposed for development is significantly above the 1 in 1000 year flood event and accordingly within Flood Zone C (probability of flooding is low at less than 1 in 1000 year probability). Box 3.1 of the Guidelines notes that *"Development should be directed towards areas of low flood probability (Zone C) and, if no sites are available in such areas, development should only be considered in areas of moderate flooding probability (Zone B) and so on."*

As the proposed development site is in an area of low flood probability, development is acceptable under the sequential approach outlined in the Guidelines.

The existing building is set at finished floor level of 6.95 metres OD Malin. There are no plans to raise the lands to the east of the site at present and the proposed structure will be set at a floor level to match the existing building. Existing ground level at the location of the proposed building extension is currently at levels of 6.85 metres OD to 6.95 metres OD and accordingly the construction of the extension to the building will have no impact on available flood storage provision at the site.

As the proposed development site is not highlighted on either OS mapping or OPW flood hazard mapping as lands liable to flood and the proposed floor level of the building is above the highest recorded tide at Foynes port, the existing building and proposed development to the west of the site are not considered to be a flooding risk.

The Site Investigation undertaken by Priority Geotechnical in June 2008 and supervised by Mouchel identified groundwater levels at between one and three metres depth below existing ground level. The full results of this investigation are set out in Appendix 10 of the EIS. The site investigation was undertaken primarily to establish issues of contamination from previous uses at the site. The site investigation indicates that there were no exceedances in relation to Environmental Quality Standards for a marine, estuarine and coastal situation. The risk to groundwater was deemed to be low to moderate in relation to the risk matrix detailed in CIRIA document 522. The recommendation by Mouchel is that there is a low risk posed to the site by the contaminants currently present.

The available GSI (Geological Survey of Ireland) information indicates that the site is located in an area where the groundwater vulnerability is shown as High to Low as only an interim study took place for the assessment of this area.

7.2.2 Water Supply – Existing Sources on Site

The existing water supply to the site is via the Foynes Harbour Water Supply Scheme. The fire water supply is taken from the Foynes Harbour Fire Supply.

The potable water supply is taken from the Limerick County Council Foynes water supply scheme, which is supplied from the Shannon Estuary Water Supply scheme whose source is the River Deel at Askeaton.

The firewater supply is provided by a 2,000,000-gallon storage reservoir located in Leahys, Foynes. The proposed development will be connected to the Foynes Harbour Fire Water Main Supply, It is understood that plans are at an advanced stage for the upgrade of the fire water supply, which is scheduled for upgrade.

7.2.3 Water Supply - Water Quality

The EPA have published a report detailing a list of 339 Drinking Water Supplies identified in the 2007-2008 EPA Drinking Water Report as requiring further examination.

One of the supplies noted was the Foynes/Shannon Estuary Public Drinking Water Supply which was noted as having failed to meet E-coli standard as reported in the Drinking Water Report. It is reported that this needs investigation and improvement if necessary to ensure that the root cause of the problem has been rectified.

From consultation with Limerick County Council, it is understood that improvements are being addressed and an upgrade of the Shannon Estuary Water Supply Treatment Plant is listed in the Water Services Investment Programme for 2007-2009.

7.3 Hydrogeology in the Existing Environment

7.3.1 Aquifer Classification and Vulnerability

The bedrock aquifers underlying the study area are classed as Locally Important with high to low vulnerability rating (only an interim study took place) becoming extreme as rock approaches surface. There are no mapped karst features within the site boundary and no karst features have been located following a detailed geophysical survey of the site. Saline intrusion has been identified during geophysical surveying and it is therefore considered that the groundwater would be unusable as a potable water source.

Reference was made to the Geological Survey of Ireland (GSI) website in relation to the presence of karstification, the aquifer classification and vulnerability within the study area.

The GSI karst database did not indicate the presence of karstification within the study area and this has been confirmed by Geophysical surveys. There are karst features noted in the adjacent Aughinish site. The karst features were noted as being identified in boreholes. Proving of rock was undertaken during the site investigation and it was confirmed that rock level falls from a maximum of +4.71 metres O.D. in the northwest of the site to a minimum of -4.05 metres O.D. in the southeast. The limestone was described as strong to extremely strong, dark grey, crystalline, bioclastic. The rock recovered from the rotary coring on site conforms to the published geology for the area. Details of the Site Investigation Assessment at the site are contained in Chapter 6, Soils and Geology. Extracts from the GSI Database are included in Appendix 16 of the EIS.

Table 7.1 Vulnerability Mapping Guidelines

	Hydrogeological Conditions				
	Subsoil Permeability (Type and Thickness)			**Unsaturated Zone**	**Karst Features**
Vulnerability Rating	High permeability (sand/gravel)	Moderate permeability (e.g. sandy subsoil)	Low permeability (e.g. clayey subsoil, clay, peat)	Sand/gravel aquifers only	<30 metre radius
Extreme (E)	0 – 3.0 metres	0 – 3.0 metres	0 – 3.0 metres	0 – 3.0 metres	-
High (H)	>3.0 metres	3.0 – 10.0 metres	3.0 – 5.0 metres	> 3.0 metres	N/A
Moderate (M)	N/A	>10.0 metres	5.0 – 10.0 metres	N/A	N/A
Low (L)	N/A	N/A	>10.0 metres	N/A	N/A

7.3.2 Quaternary Deposits

There was no published Quaternary data available for review at the time of writing the EIS.

7.3.3 Groundwater Uses and Quality

From a review of Limerick County Council supply sources and GSI data, there are no well sources identified in the vicinity of the subject site. The available information from Limerick County Council data is that the public and harbour water supplies within the vicinity of the study area are sourced from surface water sources and not groundwater sources. The local groundwater at the site is subject to saline intrusion and would be unsuitable as a potable water source.

Groundwater Sampling was undertaken during the site investigation at the site. The groundwater analytical results were screened against Environmental Quality Standards (EQS) for a marine, estuarine and coastal area. There were no exceedances identified in relation to EQS for groundwater. Elevated levels of selenium and free cyanide were noted in groundwater samples. The environmental analysis concluded that there is a low risk posed to the site by the contaminants found. The site is suitable for use in its current state and in its proposed use as a composting/biogas facility comprising buildings and hard standing.

It was noted that the metals found in leachate samples were not identified in groundwater sampling and that the risk to the adjacent Irish Cement-owned land and watercourses from the leachate is considered to be low.

7.3.4 Discharges to Groundwater from Proposed Development

There are no proposed discharges to groundwater from the proposed development. All external areas on the site are to have impermeable surface with a surface water collection system. The external surface water drainage system will be routed through a Class 1 oil interceptor prior to discharge to an attenuation tank with controlled discharge to the adjacent drainage channel. Roof water will be partly directed to a storage tank for use in the composting process.

All process operations will take place indoors on an impermeable surface and all process wastewater generated will be held in bunded storage for re-use in the process. There will be no process discharges off-site or to ground or surface water.

It is proposed that the surface water run-off will be restricted to current development discharge rates. The existing run-off from impermeable surfaces at the site is estimated

as 209 litres per second based on an area of 1.5485 hectares of impermeable surface. The run-off from the proposed development is calculated at 431 litres per second and 30 year storage will be provided at 310 cubic metres of storage both by provision of attenuation cells and also direct storage of rainwater for use in the composting process. Details of the surface water network and storage calculations are included in Appendix 17 of the EIS.

Groundwater is anticipated at 2 metres bgl (below ground level). Maximum excavation for foundations is 3.6 metres. Therefore sump pumps and gentle batters/trench boxes may be required locally to keep excavations stable. Sustained dewatering will induce settlement of the site and any adjoining sites due to reduced buoyancy of the soil. Elevated levels of selenium and free cyanide were found in boreholes to the east and northeast of the site. These are remote from the areas of deep excavation and while pumped groundwater will be monitored, and re-injected if required, as an alternative to controlled discharge to surface water drains.

7.4 Likely and Significant Impacts on Hydrology

The likely impacts of the proposed development can be divided into those that may occur during the construction phase, and those during the operational phase. Likely impacts during the construction and operational phases are detailed in Sections 7.4.1 and 7.4.3 below.

The main potential impacts during the construction relate to surface water/storm water run-off, and the potential for contamination. The extension to the facility will be built on top of an existing concrete hard standing with little excavation required thereby minimising the generation of silt.

During the operational phase, all vehicles delivering feedstock to the facility will be provided primarily by one operator who service and maintain all their vehicles in their own dedicated garage in line with all regulatory requirements and company standards. Only vehicles entering and leaving the facility will be using the external surface areas. No process operations will be conducted outdoors. The vehicles delivering and collecting material from the facility will not enter the main process area and will not be subject to contamination from process waste materials.

External surface areas will be limited to the perimeter of the building to allow access and egress for the vehicles, thereby limiting the volume of surface water run-off. The external surface water run-off will be discharged via a silt trap/oil interceptor, which will be installed at the start of the project to prevent any impacts during the construction or the operational phase. During the construction phase all vehicles will be inspected for leaks prior to entering the site.

The Shannon Estuary will be the final receiving water for external surface water run-off both during and after construction. The surface water will discharge directly to the watercourse on the eastern boundary. The volume of external surface water run-off from the development site will be limited to currently allowed discharge rates of 209 litres per seconds and suitable attenuation/rainwater harvesting systems will be utilised and special care will be taken to avoid or minimise inputs to this watercourse as it flows directly into the Shannon.

The treated office area foul effluent from the wastewater treatment unit will discharge to the Shannon via existing outfall provided as part of the contract for the adjacent facility. Emission limits will be assigned under the EPA licence for the facility for the discharge of this effluent. Due to the assimilative capacity of the large water body to which the

discharge is to be made, the discharge of this effluent will not impact on the water quality of the receiving waters. The adjacent site has recently been granted a discharge licence by Limerick County Council for discharge of treated effluent to the Shannon.

The process will generate contaminated water from the waste material. All process operations will take place indoors on an impermeable surface and all process wastewater generated will be held in bunded storage for re-use in the process. There will be no process discharges off-site or to ground or surface water.

7.4.1 Construction Phase Impacts

7.4.1.1 Potential Impact: Change in Water Quality and Habitats

In the absence of mitigation measures, water quality in the catchment could potentially be altered through the release of suspended solids and silt during earthworks and construction with potential detrimental effects on aquatic ecology. Increased siltation and turbidity reduces the amount of light penetrating the water column, thus reducing photosynthesis by aquatic flora and phytoplankton. Deposition of silt has the potential to smother salmonid and smelt spawning habitats and aquatic invertebrates and their habitat. Turbidity in the water column can disrupt the ability of the fish to see prey and damage the gills of fish and aquatic invertebrates.

7.4.1.2 Potential Impact: Toxic Pollution

A wide variety of substances that are potentially toxic to aquatic life are used in modern construction. These include specialty chemicals, oils, paints, fuels, cement and tar. Accidental leakage or discharge of chemicals and pollutants used during the construction can have direct lethal or sub-lethal impacts on fish, aquatic invertebrates and plants.

7.4.2 Proposed Mitigation Measures: Construction Phase

The preventative measures outlined in this section of the EIS will be taken in order to prevent pollution events and to limit sediment loss to the watercourses.

7.4.2.1 Siltation and Suspended Solids

Surface water run-off from the site during construction will not be allowed to flow directly either to the main river or boundary drain without prior treatment. Treatment will be in adequately-sized silt traps or series of silt traps, the final discharge from which will be filtered, e.g. through banks of straw bales held in geo-textile outfall chutes, combined if necessary with fine clean gravel beds. The outlets from the traps will be carefully engineered so that water levels can be controlled. If they become too full, they will be de-sludged in order to preserve their settlement efficiency.

Earth works will take place during periods of low rainfall to reduce run-off and potential siltation of the watercourses.

7.4.2.2 Prevention

The construction management of the project will incorporate protection measures to minimise as far as possible the risk of spillage that could lead to surface and groundwater contamination. The sources of pollution that could have an effect on the surface or groundwater will be fuels, lubricants, suspended solids, and bulk concrete. However, good construction practices should ensure minimal pollution. Such practices will include adequate bunding for oil containers, wheel washers and dust suppression on site roads, and regular plant maintenance. The Construction Industry Research and Information Association (CIRIA) provide guidance on the control and management of water pollution from construction sites (*'Control of Water Pollution from Construction Sites, guidance for*

consultants and contractors', CIRIA, 2001), which provides information on these issues. This will ensure that surface water arising during the course of construction activities will contain minimum sediment.

No storage of potential contaminants, and no refuelling of machinery will occur within 50 metres of a watercourse.

Drip-trays will be used for fixed or mobile plant such as pumps and generators in order to retain oil leaks and spills.

Concrete (including waste and wash down) will be contained and managed appropriately to prevent pollution of watercourses. Pouring will occur in the dry, with appropriate curing times (48 hours) before re-flooding. Mixer washings and excess concrete will not be discharged to water. If cement washings are to be discharged they will first be held in a treatment facility in order to neutralise the pH and to settle out solids.

Waste (including that from contractors' temporary toilet facilities) and litter generated during construction will be disposed of at suitable facilities. Toilets are available onsite within the existing building. Wastewater from the toilets currently discharges to a septic tank. As part of the proposed development, a 'Puraflo' mechanical treatment unit will be installed to replace the septic tank, and the treated effluent will be discharged to an existing foul sewer on the Port Road, adjacent to the facility. This upgrade will be completed at the beginning of the construction works to ensure there is no impact on emissions to the sewer during the construction phase.

7.4.2.3 Site Management

Highest standards of site management will be maintained and utmost care and vigilance followed to prevent accidental contamination or unnecessary disturbance to the site and surrounding environment during construction. A named person will be given the task of overseeing the pollution prevention measures agreed for the site to ensure that they are operating safely and effectively.

7.4.3 Operational Phase Impacts

A drainage model was prepared to establish the surface water drainage volumes generated from the proposed development. In addition, an assessment of the existing run-off from the facility was calculated. It is proposed to limit the surface water run-off from the facility to the current discharge rate of 209 litres per second. This will be provided by installing rainwater harvesting/attenuation cells and a hydrobrake discharge control device. It is calculated that 310 cubic metres of storage is required to provide 30 year storage for the site. Detailed calculations are included in Appendix 17.

Toilets are available onsite within the existing building. Wastewater from the toilets currently discharges to a septic tank. As part of the proposed development, a 'Puraflow' mechanical treatment unit or equivalent will be installed to replace the septic tank, and the treated effluent will be discharged to an existing foul sewer on the Port Road, adjacent to the facility. The discharge will be subject to emission limits as defined under the EPA licence.

The process will generate contaminated water from the waste material. All process operations will take place indoors on an impermeable surface and all process wastewater generated will be held in bunded storage for re-use in the process. There will be no process discharges off-site or to ground or surface water.

7.4.3.1 Potential Impact: Change in Water Quality and Habitats

The development will introduce additional impermeable surfaces, which collect storm water run-off that can potentially contain sediment or hydrocarbons from oil leakages, which have the potential to reduce water quality and have a detrimental effect on fish, and aquatic plants and invertebrates.

With regards to the potential for sediment run-off, all vehicles will be cleaned prior to leaving the source facility. Material will be delivered within the fully enclosed facility. The delivery area is designed to ensure contamination of wheels is avoided. Steam clean system is available as back up. All loads entering and leaving facility will be covered, thereby preventing littering of the site. Regular inspections for litter on the approaching roads and within the facility will be carried out.

The proposed facility will operate as a fully enclosed building with negative air pressure, and incorporate the use of sealed vessels for processing steps (Best Available Technology), extensive abatement equipment (Best Available Technology) for air management. These design measures ensure that the development will not attract animals.

With regards to the potential for hydrocarbons run-off and oil leaks, all vehicles will be regularly maintained and serviced. All wastewater within the process areas will be contained and reused in the process. External surface areas will be reduced significantly and run-off will be discharged via a Class 1 oil interceptor. Further details are provided in Section 7.4.4 below.

7.4.3.2 Potential Impact: Change in Hydrological Conditions

An increase in hard surfaces due to development alters the volume of storm water flows entering watercourses. This may scour the riverbed and banks and alter river hydrology if not controlled appropriately. Long-term changes in the flow regime of receiving waters could have adverse effects on fish spawning habitats and success, and also on aquatic invertebrate habitats and survival. Oxygen saturation levels may fluctuate to a greater extent under new flow regimes, which can impact on the success of more sensitive aquatic invertebrate species and the fish spawning environment.

Storm water discharge from the proposed development site will be limited to current runoff rates, therefore there will be no increase in the volume of storm water runoff entering the watercourse adjacent to the eastern boundary of the site.

7.4.4 Mitigation Measures – Operational Phase

The sources of pollution that could potentially have an effect on surface water during the operational phase of the development will be oil and fuel leaks from vehicles using the roads. The introduction of class 1 petrol/oil interceptors will mitigate against this. Class 1interceptors achieve a concentration of 5 mg/litre of oil under test conditions. The surface water discharge rate from the site will be restricted to the current discharge rate calculated as 209 litres per second based on existing impermeable area of 1.5485 hectares.

There will be no discharges of process wastewater from the facility as all process wastewater will be contained and reused in the process. Toilets in the office area will discharge to a 'Puraflow' or equivalent type wastewater treatment unit. The treated effluent from the Puraflow wastewater treatment unit will discharge to the existing foul sewer on the Port Road, adjacent to the site. The effluent quality will be monitored to ensure that it complies with the required discharge limits assigned by the EPA.

The process will generate contaminated water from the waste material. All process operations will take place indoors on an impermeable surface and all process wastewater generated will be held in bunded storage for re-use in the process. There will be no process discharges off-site or to ground or surface water.

7.5 Likely and Significant Impacts on Hydrogeology

7.5.1 Discharges of Treated Wastewater Effluent

In the absence of mitigation, the groundwater quality could be impacted by uncontrolled discharges of process wastewater from the composting process either through inappropriate management of the process wastewater collection and processing arrangements or by leakage through damaged pipes, sumps or bunded storage tanks.

Similarly the groundwater quality has the potential to be impacted by inadequate management of the proposed sewage treatment unit or by leakage to groundwater via damaged pipes, chambers or storage tanks. However, wastewater from the toilets in the existing building currently discharges to a septic tank. As part of the proposed development, a 'Puraflow' or equivalent mechanical treatment unit will be installed to replace the septic tank and use of the percolation area, and the treated effluent will be discharged to an existing foul sewer on the Port Road, adjacent to the facility. This upgrade will be completed at the beginning of the construction works.

All process operations will take place indoors on an impermeable surface and all process wastewater generated will be held in bunded storage for re-use in the process. There will be no process discharges off-site or to ground or surface water.

7.5.2 Storage Facilities On Site

In the absence of mitigation, groundwater quality in the catchment could be impacted by the storage of unsuitable materials on exposed permeable surfaces. These may include the storage of unprocessed organic waste materials, process wastewater, chemicals, oils, paints, fuels and cement.

7.5.3 Run-off from Paved Areas

In the absence of mitigation, groundwater quality could be affected by uncontrolled run-off from permeable surfaces and by trafficking of permeable areas by contaminated vehicles. This introduces the possibility of runoff from vehicles, which have been traversing the dirty waste area and also contamination by oil and fuels.

7.5.4 Removal of Soil Cover During Construction

The vulnerability of an aquifer is dependant on the depth of soil protection available above the aquifer – see Table 7.1. Without mitigation, the excavation of soil for process wastewater collection sumps and waste delivery area will temporarily increase the vulnerability of the aquifer during construction.

7.5.5 Reduction in Recharge Area and Effects on Local Drainage

The groundwater aquifer and groundwater levels can be impacted by the routing of rainfall, which had previously recharged the groundwater to a surface water collection network. This is particularly of concern where the aquifer is utilised as a source for drinking water supply. The construction of appropriately constructed and tested process wastewater sumps will not impact on the groundwater flow across the site from the south to the estuary as the sumps are 4.5 metres deep local depressions at 7.9 metre centres and of 1.5 metre diameter which are adequately distanced to ensure that groundwater flow will not be impeded. The sumps will be water tight to ensure that there is no risk of process

wastewater entering the surrounding ground and getting into the groundwater. The waste delivery area is similarly isolated and will be constructed to ensure that there is no risk of process wastewater entering the surrounding ground.

7.5.6 Proposed Mitigation Measures

It is critical that preventative measures are taken to prevent pollution risk to the groundwater. Groundwater monitoring will also be undertaken to demonstrate that groundwater will not be impacted by the proposed development. Groundwater monitoring locations are provided in Figure 7.1.

7.5.6.1 Disposal of Treated Wastewater Effluent

The design and construction of the process waste water and waste water pipe networks and storage chambers will be such that the systems will be leak-proof.

The pipe networks will be installed as sealed systems and appropriate testing will be undertaken at construction stage. Chambers will be designed as water retaining and appropriate base to wall details will be included to ensure water tightness. Both pipe networks and storage bunds will be subject to regular integrity testing as required under the EPA licence.

7.5.6.2 Storage Facilities on Site

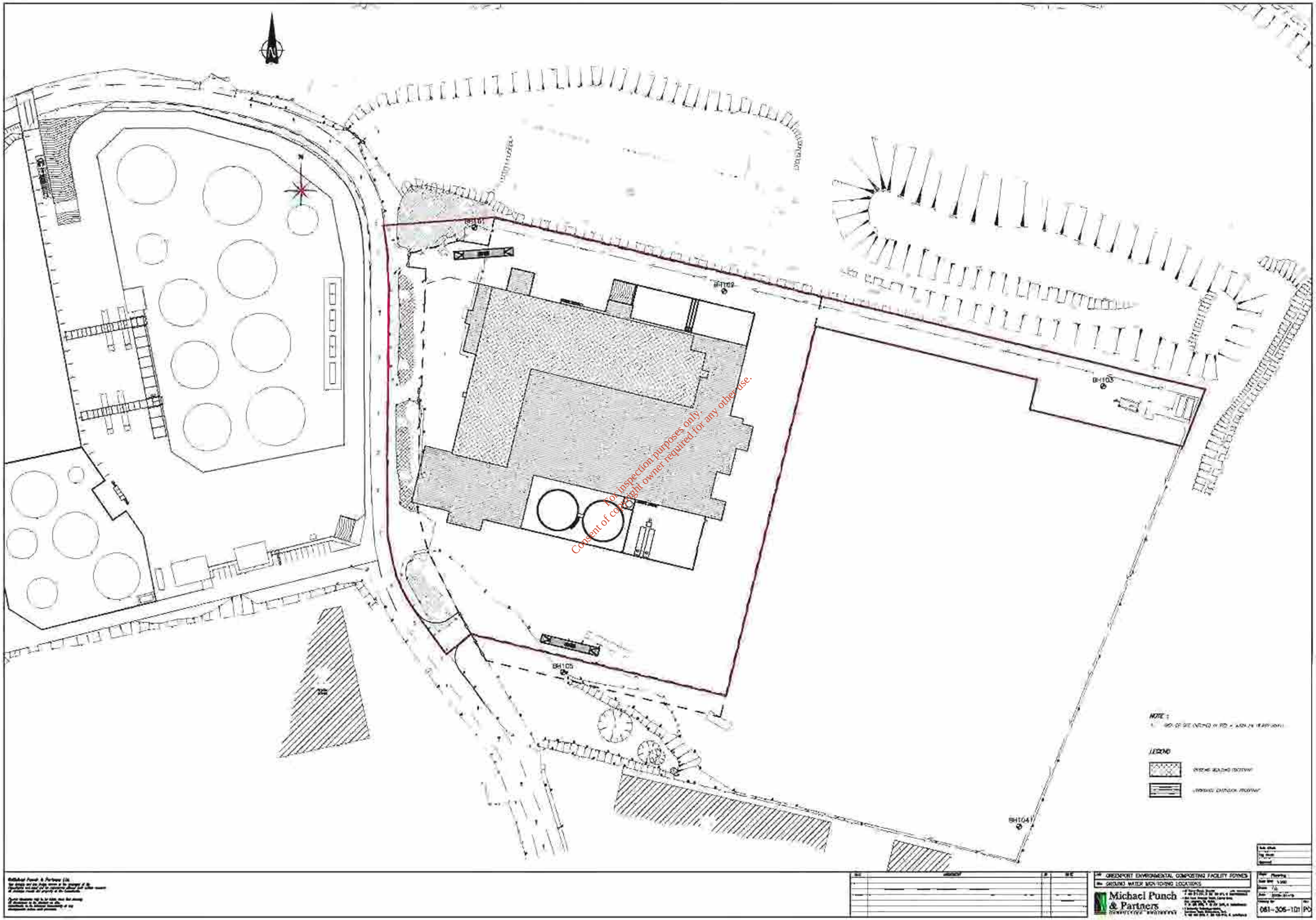
The construction management of the project will incorporate protection measures to minimise as far as possible the risk of spillage that could lead to surface and groundwater contamination. However, good construction practices will ensure minimal pollution. Such practices will include adequate bunding for oil containers, wheel washers and dust suppression on site roads, and regular plant maintenance. The Construction Industry Research and Information Association (CIRIA) provide guidance on the control and management of water pollution from construction sites (*'Control of Water Pollution from Construction Sites, guidance for consultants and contractors', CIRIA, 2001*), which provides information on these issues. This will ensure that surface water arising during the course of construction activities will contain minimum sediment.

No storage of potential contaminants, and no refuelling of machinery, will occur on any permeable surface area. Drip-trays will be used for fixed or mobile plant such as pumps and generators in order to retain oil leaks and spills.

External surface areas will be limited to the perimeter of the building to allow access and egress for the vehicles, thereby limiting the volume of surface water run-off. The external surface water run-off will be discharged via a silt trap/oil interceptor, which will be installed at the start of the project to prevent any impacts during the construction or the operational phase. During the construction phase all vehicles will be inspected for leaks prior to entering the site.

Concrete (including waste and wash down) will be contained and managed appropriately to prevent pollution of watercourses and groundwater. Pouring swill occur in the dry, with appropriate curing times (48 hours) before re-flooding. Mixer washings and excess concrete will not be discharged to water or to permeable surfaces. If cement washings are to be discharged they will first be held in a treatment facility in order to neutralise the pH and to settle out solids.

Waste (including that from contractors' temporary toilet facilities) and litter generated during construction will be stored in appropriate areas and disposed of at suitable facilities.



GREENPORT ENVIRONMENTAL COMPOSTING FACILITY FOYNES

GROUND WATER MONITORING LOCATIONS

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In the operational stage of the project, the storage of any chemicals will be in designated bunded areas within the building. Fuels and oil storage will be in appropriately bunded areas.

All untreated waste material will be contained within the building and any process waste water will be captured within the process waste water collection and storage system. The vehicles delivering the feedstock will travel on impermeable surfaces at all times where the surface water collection network will collect run-off which will be treated through the oil interceptor prior to discharge.

Vehicles delivering waste will not travel within building areas holding process material. It is therefore considered that there is no risk of material being picked up on vehicle tyres during the delivery process. Steam washer cleaning units will be provided at all vehicle access doorways to allow for discretionary wheel cleaning by drivers.

7.5.6.3 Run-off from Paved Areas

Vehicle routes within the site have been defined to ensure that all vehicles travel within the impermeable surfaces. The final details on the vehicle routes will be established in the Contractors Traffic Management Plan. The vehicles delivering the feedstock will travel on impermeable surfaces at all times. The surface water collection network will collect the run-off from these areas, which will be treated in the oil interceptor prior to discharge.

Vehicles delivering waste will not travel within building areas holding process material. It is therefore considered that there is no risk of material being picked up on vehicle tyres during the delivery process. Steam washer cleaning units will be provided at all vehicle access doorways to allow for discretionary wheel cleaning by drivers.

7.5.6.4 Removal of Soil Cover

There will be temporary increases in the aquifer vulnerability during the excavation works for foundation construction and process wastewater sumps construction. Appropriate lining of the excavation with geotextile material will be undertaken to ensure that there is no increased risk of contamination due to the temporary situation. Excavation works will be limited as most construction works will take place on existing hard standing areas.

7.5.6.5 Reduction in Recharge Area and Effects on Local Drainage

The groundwater aquifer and groundwater levels can be impacted by the routing of rainfall, which had previously recharged the groundwater to a surface water collection network. This is particularly of concern where an aquifer is utilised as a source for drinking water supply. It has been confirmed that the aquifer at this location is not utilised as a drinking water source.