NON-TECHNICAL SUMMARY

OF THE

ENVIRONMENTAL IMPACT STATEMENT

FOR A

WASTE TRANSFER STATION

AT

BALLINAGUN WEST,

CREE,

CO. CLARE

- An Environmental Impact Statement -

Volume II

NON-TECHNICAL SUMMARY

Date: December 2009

A Submission by Bord na Móna Environmental Limited on behalf of
Clean (Irl) Refuse & Recycling Ltd.

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1 INTRODUCTION

This report presents the results of an Environmental Impact Assessment on an existing and proposed upgrade of a waste transfer station at Cree, Co. Clare. The proposed development will be located at the existing Clean (Irl) Refuse & Recycling Ltd site to accommodate an increase in annual tonnage intake, the introduction of new waste processing activities and the expansion of the site area.

Bord na Móna Technical Services was commissioned by Clean (Irl) Refuse & Recycling Ltd. to complete an Environmental Impact Statement to accompany a Waste Licence and subsequent Planning Application.

2 PROJECT DESCRIPTION

2.1 Site Description

The site for the proposed development is located in the town land of Ballinagun West, approximately 1.4km southwest of Cree, Co. Clare. The site occupies a total area of c.3.0ha. The site is wholly owned by Clean (Irl) Refuse & Recycling Ltd. The site is currently occupied by the existing waste processing buildings, which will not be altered as part of this development.
The site is located within a predominantly rural environment with agricultural lands and a number of residential properties located along the roadways. The entrance is located to the north of the site on the L-6108.

2.2 Project Description

Initial Development Phase

In terms of the existing area of the site, the only increase to the site area under the proposed development will be an increase in area of c.0.4ha at the north of the facility thereby extending the site to the north only. The existing processing buildings and site infrastructure (ballistic separators, balers, conveyor belts) will not be impacted by the introduction of the new processes and development of the site. The most significant development of the site will be localised to the most southerly section of the site where it is proposed to build a biostabiliation plant with adjacent biofilter. The Biostabilisation plant will house a CHP engine which will utilise biogas to generate electricity with potential to feed into the national grid. Extensions to the existing processing buildings, relocation of the glass bunkers, installation of diesel storage bunded unit, and the creation of End of Life Vehicle unit will be secondary in terms of the scale of the development.

It is envisaged that, due to the different aspects of the development, construction will take place at the site during approximately five phases following the planning process. The facility will remain operational during this time and works will be carried out at defined intervals. The site development works and construction sequence for the proposed development will, in general, comprise the following main steps. In turn such phases will generate construction traffic on a temporary basis:

- Stripping of field and overlaying with hardcore
- Construction of earthen berms skip storage area
- Hardstanding Phase 1 of skip storage area
- Construction of extensions to processing buildings
- Construction of glass bunkers
- Construction of End of Life Vehicle Unit
- Installation of wheel/truck wash and leachate holding tank
- Construction of Biostabilisation Plant and Biofilter
- Hardstanding Phase 2 of skip storage area
- Ongoing hardstanding of the hardcore areas

Operational Phases

It is intended that the longevity of the facility is greater than 20 years. The development of the site will permit the continuation of existing waste processes which include:

- Dry recyclable processing
- Wet waste processing
- Baling of material
- Dropdown skip processing
- Timber shredding processing
- Construction and Demolition waste processing

The introduction of new waste processes/activities which will include:

- Biostabilisation (dry fermentation and in vessel composting tunnels) of source segregated brown waste and organic fines from Municipal Solid Waste (MSW) using mechanical separation technique
- Utilisation of Biogas from dry fermentation process in a CHP Engine to providing heat and electricity
- End of Life Vehicle processing
- Hazardous waste acceptance and storage
- Storage of Refuse Derived Fuel (RDF)
- Truck wash
- Wheel wash
- Skip storage

Proposed hours of operation:

7a.m. to 12a.m. Monday to Saturday
8 a.m. to 6p.m. Sunday

Proposed hours of waste acceptance/handling:

8a.m. to 8a.m. Monday to Saturday
8a.m. to 6p.m. Sunday

Proposed hours of any construction and development works at the facility and timeframes:

9a.m. to 6p.m. Monday to Friday
9a.m. to 1p.m. Saturday

Biostabilisation

Clean (Irl) Refuse & Recycling Ltd. is proposing to build and operate a state-of-the-art, totally enclosed facility to convert up to 15,000 tonnes per year of biodegradable materials found in the residential and commercial waste streams into fully stable and marketable soil amendment products. This facility will utilise proven, best available control technologies and best management practices for processing biodegradable waste materials, such as landscape materials, food, wood and non-recyclable paper, into valuable soil enhancing products while minimising any potential impacts to the environment or nuisances to neighbours.

The reception and pre-treatment of the bio-waste will occur within the waste reception building. The bio-waste is loaded into dry fermentation chambers for a duration of 28 days. Digestion (AD) process is initiated through the spraying of activated anaerobic percolate onto the biomass. The biomass is heated to 37-40^{o}C and biogas production is facilitated. This biogas is drawn off the tunnels and stored prior to use as fuel in a CHP gas engine. 50% of the load is transferred to incoming stock and 50% is transferred to the composting tunnel, giving each particle a retention time of 56 days. The next step takes involves in-vessel composting of the bio-waste where the treatment takes place is closed aerated tunnels for 14-28 days. Following composting, screening of the material will take pace to separate different size particles. The screened compost is transferred to a pasteurisation tunnel and heated in the presence of oxygen to 60-80 degrees C for sixty minutes in accordance with the Animal by-products regulations. After the pasteurisation, the blowers automatically revert to heat exchange mode to bring the temperature down and thus facilitate further mesophylic maturation during the remaining 4-7 days. The final product is transferred to the compost storage area at the rear of the biosatbilisation plant. .

Since the facility is totally enclosed, potential environmental impacts can be managed and controlled so that there will be negligible impact on the environment and nuisances can be minimised for surrounding neighbours and the community at large. All process and building air will be collected and treated to eliminate offensive odours and dust from migrating off site. Similarly any liquids generated in the tipping area will be collected and reused in the process. This eliminates any potential pollution of ground water or surface water sources under, on or near the facility. Noise is also limited as all activities will take place indoors. Finally, the enclosed nature of the facility restricts access to pests such as rodents, birds or insects so pest control measures within the facility can be effective in eliminating pest infestations or problems.

Provision to End of Life Vehicle unit

This process will involve depolluting the vehicle prior to disassembling the body of the vehicle. All parts will be recycled by incorporating the material into the existing segregation process at the facility. Independent bunding will be put in place for the storage of oil filters, engine oils, lead acid batteries and engine parts retaining grease or other hydrocarbons. Scrap metals will be removed to designated scrap metal area at the facility.

Ttruck wash

A truck wash area will be situated at the north east perimeter to with a leachate holding tank for washings of trucks. The activity will be fully contained and will not have the potential to contaminate surface water on site.

Wheel wash

A wheel wash will be introduced to the site to ensure that no waste is transferred across the site hardstanded surface or on external roads.

CHP Engine (electricity production)

A CHP engine will be housed in the Biostabilisation plant. Biogas generated during the fermentation process will be stored in gas storage tanks and used as required. The biogas will be used by the engine to generate heat and power, sufficient to meet the demands of the running of the Biostabilisation plant and also with potential to export to the nationall grid.

Skip storage

The storage area will be placed in the extended area to the north of the site which is currently not within the site boundary. The area will be primarily used to store empty skips and will be hardstanded in the two phases. It is estimated that the area will be able to store up to 50 skips. Skip trucks entering the storage area will be infrequent and screening will be put in place to reduce the visual impact

3 ENVIRONMENTAL IMPACT STATEMENT

The environmental impacts of the proposed extraction development are described within the Environmental Impact Statement under the following categories:

Human Beings	Flora and Fauna
Soil & Geology	Hydrology
Hydrogeology	Air
Noise	Traffic
Climatic Factors	Landscape
Cultural Heritage	Material Assets
Interactions of the above	

In order to assess the impacts of the development on the site and its environs, a series of field investigations and desk based studies were conducted by technical staff from Bord na Móna Technical Services from September 2008 to December 2008. These studies enabled an assessment of the environmental impacts, if any, that activities may have on the receiving water, soil, ecological and air environments.

3.1 Human Beings

The existing Clean (Irl) Refuse & Recycling Ltd. site is located at Cree within the Kilrush rural area in County Clare, c.14km north of Kilrush and c.38km southeast of the town of Ennis. The site is situated within the Ballinagun West townland. The main access to the site is via a local road west (c.0.8km) off the R483 Kilrush to Quilty road. The proximity to the small village of Cree is c1.4km. The population of the surrounding area is consistent with the rural setting, with the area characterised by one off housing and ribbon development along the nearby roadways. There are 13 residences within 500 m of the site and a total of 22 houses located along the local road L-6108 on which the Clean (Irl) Refuse & Recycling Ltd. is sited off.

Impacts of the Proposed Development

Noise

A noise assessment was carried out at the facility and it concluded that the noise levels from on-site activities associated with the operational phase of the development will not significantly impact on the ambient noise levels from the surrounding areas, providing mitigation measures are put into place during the construction and operational phases. Screening by means of earthern berms, and the enclosure of waste activities and plant will reduce noise emissions from the site.

Traffic

A traffic impact assessment was conducted in order to assess the potential impacts of traffic movements generated in relation to the proposed increase in tonnages. It is estimated there will be under a three fold increase in traffic movements from 88 to 222 per week of Clean (Irl) Refuse & Recycling waste vehicles only. This figure is exclusive of the traffic movements associated with employee private cars, which will account for a maximum of 50-60 movements per day or 275-330 per week. The proposed routes via the R484 and R483 to national roads are established waste collection routes. However, due to the nature of the business the traffic generated will be intermittent and the volume will be dependent on customer requirements. A number of mitigation measures were proposed to alleviate potential impact points.

Human Health

A number of air pollutants have known or suspected harmful effects on human health and the environment. In many areas these pollutants are principally the products of combustion from space heating, power generation or from motor vehicle traffic. The air pollutants derived from the waste activities can be separated into traffic derived emissions, dust deposition, biofilter emissions and CHP engine emissions. The presence of on-site vehicles will give rise to NO_2, BTEX and SO_2 emissions. Good site practices will be implemented to minimise these emissions. All vehicles and machinery will be switched off when not in use to eliminate any unnecessary emissions. Dust minimisation measures will be implemented during the construction phase of the project in order to reduce the potential for the migration of dust from the site and from the construction traffic using public roads. Full enclosure of the composting process will ensure that the emission of bio-aerosols to the surrounding environment will be minimised and that the levels of this parameter will not have a significant impact on the surrounding environment. The CHP engine will be state of the art using BAT to ensure reduction of potential air pollutants.

Site Structure / Land Use

Land use in the vicinity of the project site is predominately agricultural with a number of residences located along the nearby roadways. The maximum height of the Biostabilisation plant (apex 10.7m) will be slightly lower than that of the highest apex of existing buildings (waste processing sheds apex 10.84m). The biofilter stack will be 6.5m in height, but as this is at the rear of the Biostabilisation plant, the visibility will be impaired from surrounding view points. The CHP engine will have a emission stack of 8m in height which will be located adjacent at the rear wall of the Biostabilisation building. Neither stack is taller than the highest point of the roof and therefore will not be causing any intrusion on the surrounding landscape. To accommodate the extension of the existing waste processing buildings for the timber shredder and the storage of C&D waste, the maximium apex of the extension will be 12.23m to ensure working plant will not cause damage to the interior of the building during operation. The proposed skip storage area will have earthen berms created to conceal skips that may be stored at this area. Existing railway sleepers at the east perimeter and earthen berms at the west perimeter have been constructed in such a manner as create minimum visual intrusion on the existing residents and road users, which would reduce long-term visual impacts. Landscaping at the southern and eastern berm contribute to the visual aspects of the site.

Socio-Economic

The development has, although limited, varied social and economic effects. These effects may be categorised as follows:

- Primary Socio-Economic Effects: It is considered likely that the operational phase of the development has and will have minimal impacts on the existing population structure of the area. The job creation benefits are secondary to the development, as it is the service provided by the company to the extended region that benefits the local and regional customers in terms of a contribution to waste management policy. The continuation of the facility will serve to retain the jobs currently associated with the facility and will involve the recruitment of two permanent operators for the operation of the Biostabilisation Plant.

- Service required (electricity, telecommunications, etc.) for the development will be obtained through existing service lines and introduction of the CHP engine to generate electricity for the operation of the site.

3.2 Flora & Fauna

A baseline surveys were undertaken by Bord na Móna Technical Services during the summer of 2008.

The site is not designated as a Natural Heritage Area or a Special Protection Area under the Birds Directive (79/409/EEC) or as a Special Area of Conservation in accordance with the Habitats Directive (92/43/EEC) nor is it designated under any of the other nature conservation designations currently used. No species on the list of the Flora Protection Order 1999 or rare species lists of the Red Data Book were found at the site. The main habitats occurring within the site area are detailed below, with their classifications (according to the Heritage Council) in parentheses.

(i) Hedgerows (WL1)
(ii) Earth Banks (BL2)

(iii) Drainage Ditches (FW4)
(iv) Buildings and Artificial Surfaces (BL3)
(v) Refuse and Other Waste (ED5)

Other habitats occurring within the vicinity, but not directly associated with the site include:

(vi) Conifer Plantation (WD4)
(vii) Marsh (WS1)
(viii) Treelines (WL2)
(ix) Scrub (WS1)
(x) Broadleaf Woodland (WD1)
(xi) Wet Grassland (GS4)
(xii) Stonewalls and Other Stonework (BL2)

The surrounding land is a mixture of one-off housing and fields; with hedgerows, chain & link fencing or low-rise stone walls defining land and property boundaries. The dominant habitat identified at the site is the artificial surface in terms of the greatest area however, the habitat with the greatest variety of wild flowers and grasses, was the Earth Banks or 'earthen berms' which define sections of the boundary for the site. The area for the expansion of the site, where it is proposed to be a hardstanded skip storage area, is located on an agricultural well drained field which is common to the immediate surrounding area at the north of the local roadway. This piece of land is currently soil stripped, with existing habitats in the hedgerows at the east and north remaining unaffected. Earthen berms have been introduced for screening and boundary purposes and will eventually be colonised with species typical throughout the Irish countryside. None of the plant species or habitats recorded are rare or endangered.

Impacts of the Proposed Development

The level of risk of the existing and proposed operations having any significant impact on either the pNHA at White Strand Carrowmore Marsh which lies c.3km west of the proposed site, or the designated SAC of Carrowmore Dunes (SAC 002550) which is the closest designated area to the site, is low. Existing berms will remain in place and there will be no significant impact on the established habitats at the boundary Earth Banks. There will be no alteration to the Hedgerows at the boundary sections and the habitat will therefore be conserved.

Mitigation Measures

The development of the area will not encroach or impact upon the drainage ditch or hedgerow at the east of the proposed area. The Earthen berms created and planted with native tree and shrub species will be maintained. Existing landscaping around the boundary of the facility shall be maintained through regular inspection and replacement planting of species or individual plants that may die off .

The habitats encountered on the site and its environs are widespread and very typical throughout the Irish countryside and none of the habitats were recorded as having high conservation value.

3.3 Soil & Geology

The study area is underlain by Gley Soils and Quaternary Glacial Tills. The Gley soils have development due to the low permeability characteristics of the glacial till. The quality of the soil is generally clean and is indicative of Irish Soils. The glacial till is known to be >1.9 m in thickness and is described as mottled brown clay with clasts (Namurian rocks). The permeability characteristics are poor. The bedrock geology underlying the site is identified as Namurian Sandstones which consist of siltstones and sandstones.

Impacts of the Proposed Development

Due to the nature of the waste activities on site, there is the potential for the discharge of potential polluting substances into the subsurface such as leachate from waste handled on site, storage of hazardous waste, hydrocarbons from vehicles and fuel storage. Mitigation measures and best practice operations ensure there is no negative impact on the underlying subsurface. The site is covered with hardstanding to protect the underlying subsurface.

Mitigation Measures

All potentially polluting substances are stored and handled in designated areas on site. These designated areas (fuel storage area/hazardous waste storage area/waste acceptance area) are bunded and designed to contain any of the substances therein. A leachate collection system on site diverts any leachate into a holding tank where it is collected for treatment in the Local Authority wastewater treatment plant. Spillage kits will be located throughout the facility in case of an unforeseen spillage/leakage of potential polluting substances. All equipment on-site is serviced regularly. The facility will operate under a waste licence with conditions in place to protect the underlying subsurface.

3.4 Hydrology

The proposed site is located within the River Creegh sub-catchment, which is in turn located within the Mal Bay hydrometric area (hydrometric area no. 28). The hydrometric area is described as the surface catchment drained by all streams entering tidal water in Malbay between Gerorge's Head and Black Head, Co. Clare. There is no direct discharge into a river or stream from the facility. There are however two outfalls from the site discharge surface water into field ditch drains, which ultimately drain into the River Creegh.

As part of this study, a desk based assessment of the River Creegh was carried out using information gathered from the Environmental Protection Agency and Clare County Council. The quality of the surface water network around the site was examined. Two monitoring locations on the River Creegh are used by both the EPA and Clare County Council. Biological monitoring has been undertaken at Creegh Bridge and Mountrivers Bridge and the results of the river indicate that the river is generally classifed as being slightly polluted.

The surface water quality results for the discharge from the site indicate that the quality of the water within the vicinity of the site is, in general, not impacting on the quality of the River Cree.

Potential Impacts of the Proposed Development

There is potential for release of pollutants to surface waters from the following identified sources:

- Leachate generation from contact of water with waste
- Surface covering and drainage design impacts the quality of surface water draining across the site
- Handling and storage of raw materials or hazardous materials where the potential exists for uncontrolled discharge of materials such as fuels, lubricants and hydraulic fluids to both ground and surface water. Fuel dispensing is undertaken in a controlled, paved, bunded environment, where there are drip trays and spill kits available

Mitigation Measures

Leachate will be generated in the reception hall and curing area of the Biostabilisation Plant. All leachate within the Biostabilisation building will be self-contained due to the proposed design of the floor area and building. Two overground leachate tanks will have a capacity such that all leachate generated from the floor area may be stored. Wheel wash and truck wash will be carried out in designated areas where all leachate will be contained and removed off site for disposal with an approved waste contractor. Glass, Timber and C&D waste will be stored indoors. Baled waste will be stored indoors, baled RDF ,material will be stored in containers until removed from site. The hardstanded areas will be extended to cover the entire site and surface water discharged from the facility will passed through an oil/silt interceptor

All hydrocarbons and hazardous waste from the depollution of End of Life Vehicles will be in designated bunds, quarantine items will be indoors and in designated containers. All hazardous waste will be stored in quarantine items, which will be indoors and in designated containers

3.5 Hydrogeology

Groundwater recharge in the study area is through diffuse sources (ie. rainfall), with recharge estimated at c. 200 – 2500 mm/yr. There were no karst features identified in the area. According to the Geological Survey of Ireland (GSI), the aquifer classification is given as locally important bedrock aquifer which is generally moderately productive only in local zones. Groundwater quality beneath the site is generally clean and free from contamination. Groundwater is used at the facility and local as a means of domestic water supply as there is no mains water servicing the area. It is assumed that houses have individual private wells for domestic usage or avail of the Drumehilly Group water Scheme. Groundwater vulnerability is classified by the GSI as high to extreme. The site is covered by hardstanding areas which provide protection to the underlying groundwaters.

Groundwater abstractions on site are minimal and are considered similar to that of a small farm and domestic residences, water requirements for the composting process will be met for the most part by harvesting roof water in three 30m^3 tankers located adjacent to this plant. These low abstraction rates will not be significantly increased and are not considered to have a negative impact on the underlying aquifer.

Treated domestic effluent from the wastewater treatment plant on site is discharged to groundwaters via a percolation area. A site suitability assessment was carried out on-site and ongoing monitoring of the treated effluent indicated that this discharge should not have a significant impact on the underlying groundwaters.

Potential Impacts of the Proposed Development

Due to the nature of the waste activities on site, there is the potential for the discharge of potential polluting substances into the groundwaters such as leachate from waste handled on site, hazardous waste storage and hydrocarbons from vehicles and fuel storage. Mitigation measures and best practice operations ensure there is no negative impact on the underlying groundwaters.

Mitigation Measures

All potentially polluting substances are stored and handled in designated areas on site. These designated areas (fuel storage area/waste acceptance area) are bunded and designed to contain any of the substances therein. A leachate collection system on site diverts any leachate into a holding tank where it is collected for treatment in the Local Authority wastewater treatment plant. Spillage kits will be located throughout the facility in the case of an unforeseen spillage/leakage of potential polluting substances. All equipment on site is serviced regularly.

A surface water drainage system directs run-off from the yard area through a siltation trap and oil interceptor for discharge off site. The facility will operate under a waste licence with conditions in place to protect the underlying subsurface.

3.6 Air

To determine the baseline air quality and subsequently assess the impact of the development the following approach was taken:

- Identification of the potential pollutants
- Monitoring of pollutants to assess the current air quality levels
- Discussion of the potential impact to air quality during the operational phases of the development
- Mitigation measures to minimise these potential impacts.

Potential Impact of the Proposed Development

Examination of both the existing and proposed processes indicates that a number of potential pollutants may be produced at significant levels to have an impact on the existing air quality. The identified pollutants include:

- Particulates (Dust Deposition)
- Incomplete combustion products
- Traffic derived pollutants
- Odour
- Bio aerosols

Mitigation Measures

Dust minimisation measures will be implemented during the construction phase of the project in order to reduce the potential for the migration of dust from the site and from the construction traffic using public roads.

The presence of on-site vehicles will give rise to NO_2, BTEX and SO_2 emissions. Good site practices will be implemented to minimise these emissions. All vehicles and machinery will be switched off when not in use to eliminate any unnecessary emissions.

The operation of the CHP engine will be in line with BAT requirements. The plant itself will be a new previously unused piece of equipment that will operate to the highest technical specifications. The raw material feed stock for the operation of this unit will only consist of wood chip, paper and cardboard and will therefore not come in under the requirements of the

Waste Incineration Directive. As the plant will be new, it will comply with the BAT emission requirements for this type of gasification process. Therefore, the potential impact of this unit will be minimal.

Full enclosure of the composting process will ensure that the emission of bio-aerosols to the surrounding environment will be minimised and that the levels of this parameter will not have a significant impact on the surrounding environment.

All activities that have a high potential for odour generation such as feedstock blending, tunnel loading/unloading, composting, curing, turning of curing piles and screening will be carried out within the proposed building or enclosed composting system to ensure capture and treatment of any odours produced.

3.7 Noise

A survey of baseline noise levels at the site of the waste transfer station of Clean (Irl) Refuse & Recycling Ltd. has been conducted during 2007 and 2008 by Bord na Móna Technical Services, to determine current noise levels at the site perimeters and at noise sensitive locations situated close to the facility.

Potential Impacts of the Proposed development

All operations at the development may give rise to potential impact on the existing noise environment.

Noise levels recorded during the operation of the facility show that noise levels are in compliance with the 55dBA L_{eq} daytime value at the noise sensitive location. The majority of the boundary locations are also within the limit. The screening berms around the boundary of the site will also act to reduce the noise impact further. In addition the presence of the proposed Biostabilisation Plant will act as a buffer for noise emitted from the south of the site. Construction noise will be intermittent and best practices will be employed to mitigate any increase in noise levels from the facility.

Mitigation Measures

The control of on-site activities through the implementation of good management practices will combine to ensure that the noise generated at the site will not have any undesirable effects on the existing neighbouring environment. Measures such as cladding of the trommel may be required to reduce plant noise. The movement of plant at C&D waste storage area and feeding into conveyor belt will be enclosed along with the proposed enclosure of the timber shredder.

All processing equipment associated with the Biostabilisation Plant including shredders, mixers, front-end loaders and screens will be operated within enclosed buildings during defined working hours each day, thus reducing any noise from these sources. The engine associated with the CHP engine will have noise reducers in line with BAT.

3.8 Traffic

A Traffic Impact Assessment was carried out to examine the potential impacts on the existing road networks of the traffic generated as a result of the proposed upgrade at Clean (Ireland) Refuse & Recycling Ltd.

Existing access into the site is through a gated entrance at the north of the site *via* the weighbridge only. The location of the main entrance to the facility will not be altered under the proposed upgrade of the facility. It is envisaged that the proposed skip storage area at the north of the site will be accessed though the existing car park. The design of the existing site access ensures that vehicles entering the site do not impede the traffic flow on the public road.

Impacts of the Proposed Development

The construction techniques will directly correlate with the type of traffic that will be required to complete the upgrade of the site. Several different types of construction vehicles will have to be brought on site. Processing buildings to be constructed will be prefabricated in sections and will arrive by HGV to site where they are assembled *insitu* using a crane which will also have to transported to the site. Traffic levels associated with the proposed infrastructure upgrade will result in a significant but temporary impact to traffic in the locality.

The current number of Clean (Irl) Refuse & Recycling Ltd household customers is approximately 18,000, and with the proposed development of the site the company aims to increase the customer base (household) to 30,000. The existing collection routes will continue to be used, and extra routes may be added to the collection schedule depending on the need for the bin collection service in the area. Traffic movements will increase with the rise in tonnages. The greatest increase is related to C&D waste, which shows over a 300% increase in movements.

Mitigation Measures

To minimise traffic disruption, waste trucks will not pass through Kilmihill outside peak hours (i.e. 7am-9am and 4pm to 6 pm.) and National roads will be used as traffic routes as alternatives to local roads.Brown bin waste collection will be centralised at an alternative depot to reduce the number·of·traffic·movements·to·the·site·in·Cree.

Construction traffic will be infrequent over a long duration of time and existing lay-bys on the L-6108 will continue to serve the public vehicles.

3.9 Climatic Factors

The closest synoptic station is Shannon synoptic station located east of the Creegh site (c.37km). Data for this station has been used as it is more likely to represent climate conditions at the Cree site due to its proximity to the coast.

The climate of the development site is characterised as follows:

- The prevailing wind direction over Ireland is from the south and west, and this is likely to be the case at the site.
- The strongest winds for the Cree site occur during the period from October to March
- The strongest winds for the Cree site (greater than 10knots / 5.15m/s) occur during the period from October to March (excluding November).
- Air temperature ranges from a mean monthly temperature of 5.4°C in January to 15.7°C in July

The development is not energy intensive and does not result in large scale emissions to the atmosphere. The use of natural lighting, energy efficient lights and ventilation equipment will minimise the energy requirements and hence the impact on the climate. It is not considered that the development has any impact on the climate in this area.

3.10 Landscape and Visual Impacts

The site is situated in a rural setting in west Clare where the immediate surrounding landscape is dominated by flat green fields intermingling with gently rolling hills. There are no landscape sensitive areas, designated routes, designated views or areas protected for nature in the immediate vicinity of the site. The recreational areas in the vicinity of the site are mainly beaches and small coastal villages, with White Strand beach being the closest recreational area at approximately 5km from the site in Cree.

Potential Impact of the Development

The proposed site will have a long term impact as it is intended that the facility will operate for a further twenty to fifty years. The expansion of the site is considered to be a visual intrusion rather than an obstruction, as the proposed development will be an addition to the existing intrusion on the landscape thereby, impinging on the existing view without obscuring it. The development will give rise to visual intrusion for the private dwellings on the local road, however it is contended that visibility is limited due to natural cover and intermingling drumlins.

Mitigation Measures

The visual impact will be minimised through the appropriate mitigation measures follows:

- Existing berms, hedgerows and landscaping at the east and south perimeter will be maintained
- Buildings will be constructed to be uniform with existing buildings and will reflect typical agricultural structures in the area
- Southern boundary will be fully stabilised and planted following construction works

3.11 Cultural Heritage

An archaeological assessment of the Clean (Irl) Refuse & Recycling Ltd. site and its environs was undertaken by archaeologist Annette Quinn of Tobar Archaeological Services at the request of Bord na Mona Technical Services in May 2005, in conjunction with a planning application relating to buildings at the site.

This assessment examined the archaeological heritage of the development area in order to identify any known or potential archaeological constraints. It also assesses any likely impacts on any known or potential features of archaeological importance and offers recommendations for the mitigation measures to be taken.

The archaeology assessment did not indicate any archaeological features in the development area. The development will not physically affect any recorded monument listed within the Record of Monuments and Places (RMP). No surface features of an archaeological nature were identified. There are no Monuments listed in the RMP within the development site.

The nearest recorded monument (in excess of 100m of the proposed site) (RMPCL047-050) is located west of the proposed site in the townland of Ballinagun West. The monument consists of a substantial earthen enclosure which is situated immediately south of the existing public roadway.

Cree Bridge (RPA 198) is listed as a protected bridge under the CDP 2005-2011 and is described as a three arched road bridge (c.1820) over a river. There are no other listed architectural features in the vicinity of the Clean (Irl) Refuse & Recycling site.

Potential Impacts of Quarry Development

By their very nature, developments of this kind are likely to have an impact on their environs. Topsoil stripping, ground reductions and general landscaping works have the potential of revealing hitherto unknown sites, features and artefacts of archaeological potential and interest. Furthermore, extant remains, whether or not previously identified and recorded, also have the ability to be damaged or destroyed. There are no recommended mitigation measures arising from the archaeological study of the site.

3.12 MATERIAL ASSETS

It is contended that the material asset values of the surrounding area will not be significantly affected by the development as the environmental impacts (air, noise and water pollution, visual intrusion, traffic impacts) of the activity are shown to be minimal.

The development is in character with activities currently being undertaken at the site.

4.0 CONCLUSIONS

In summary, it is contended that the negative impacts of the development of the waste transfer station at Cree, Clare can be minimised or eliminated by adherence to the mitigation measures. The Environmental Impact Statement, therefore, shows that no significant adverse effect on the environment should occur as a result of this development.

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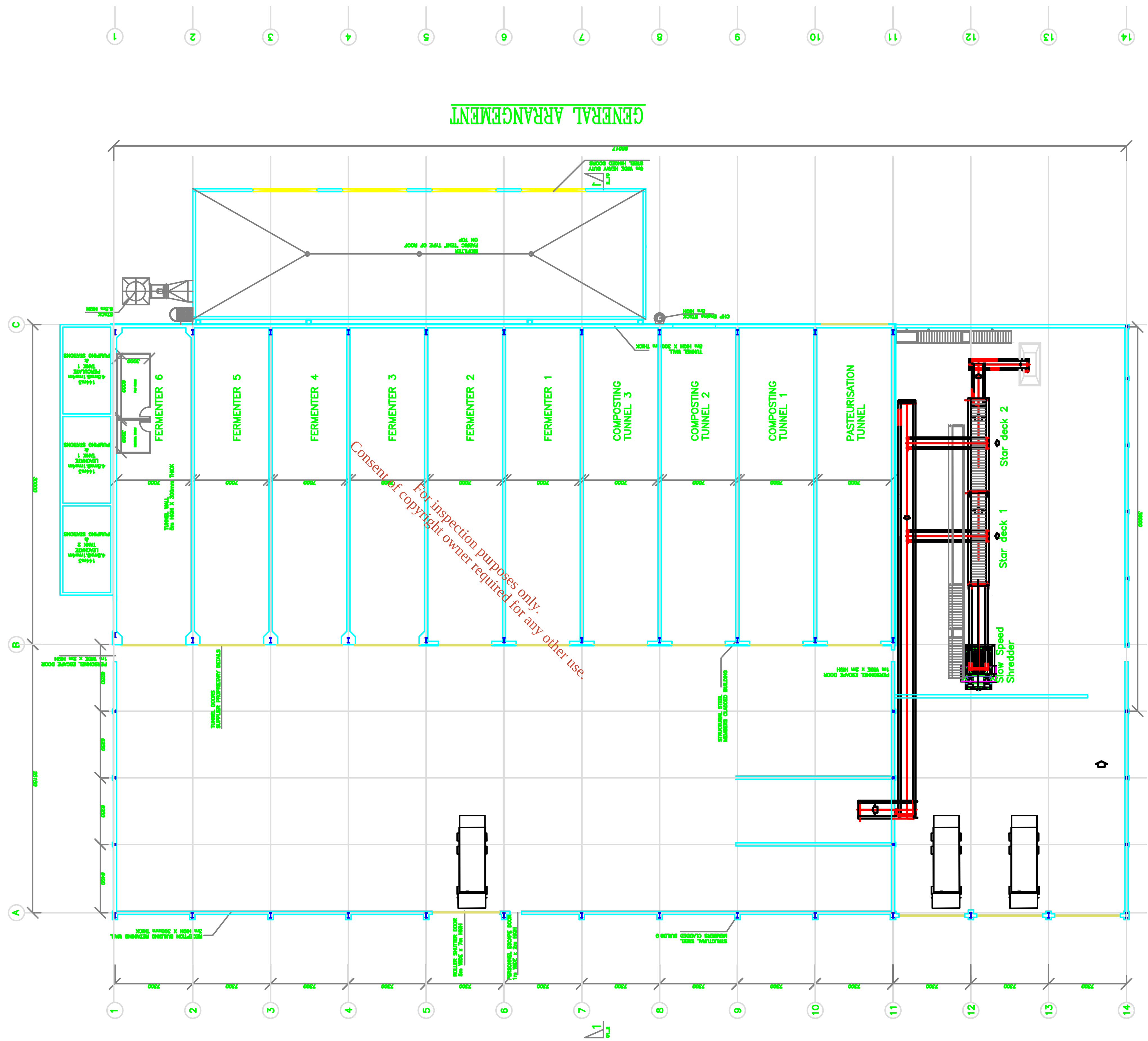

Project: EIS/WL Application

Client: Clean (Irl) Refuse & recycling ltd.

Dwg Ref: C(IRL)WL-27.Rev1

Date 20/11/2009 Scale 1:1000

REV: DATE:

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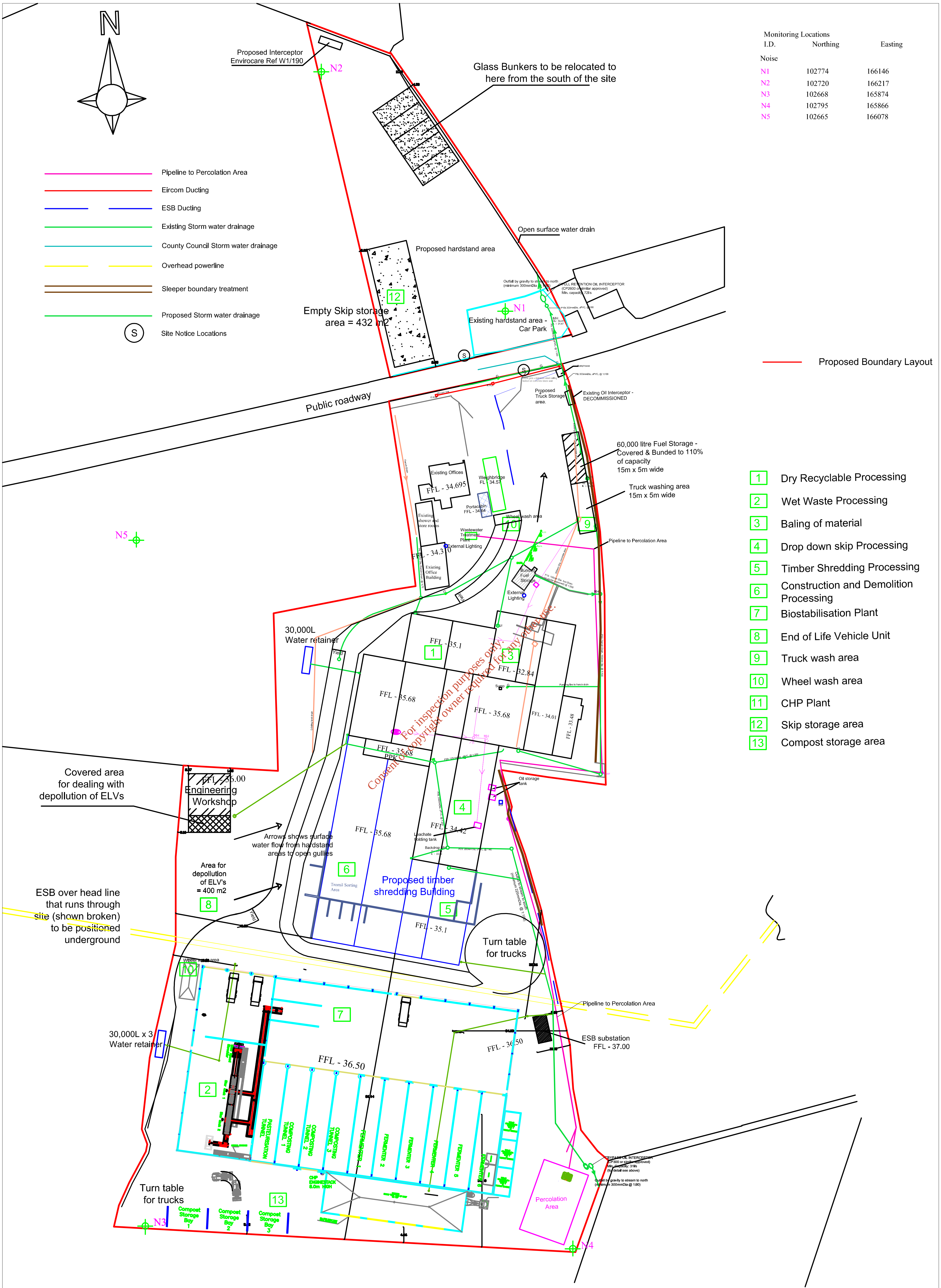
Celtic Composting Systems Ltd

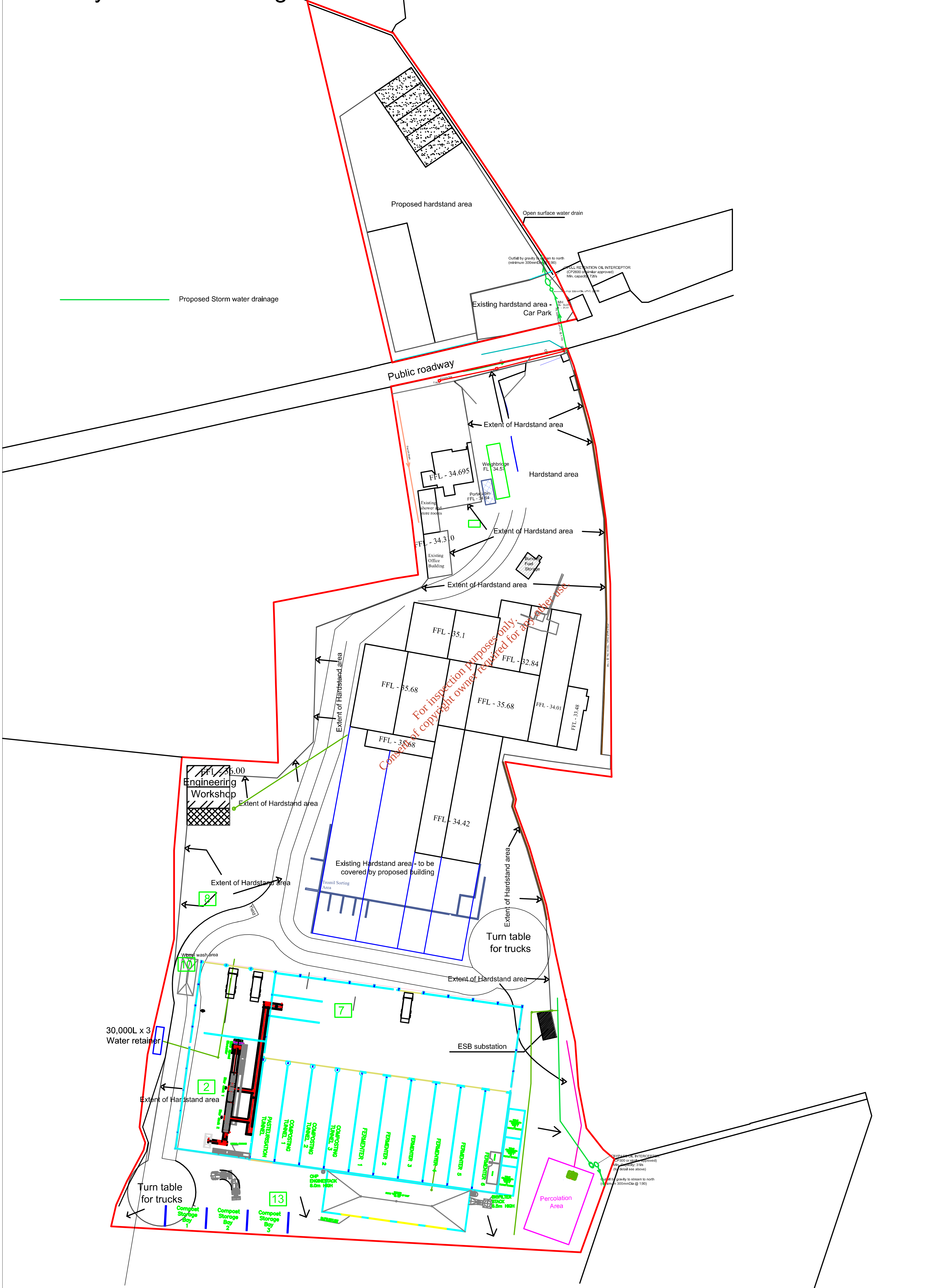


Monitoring Locations

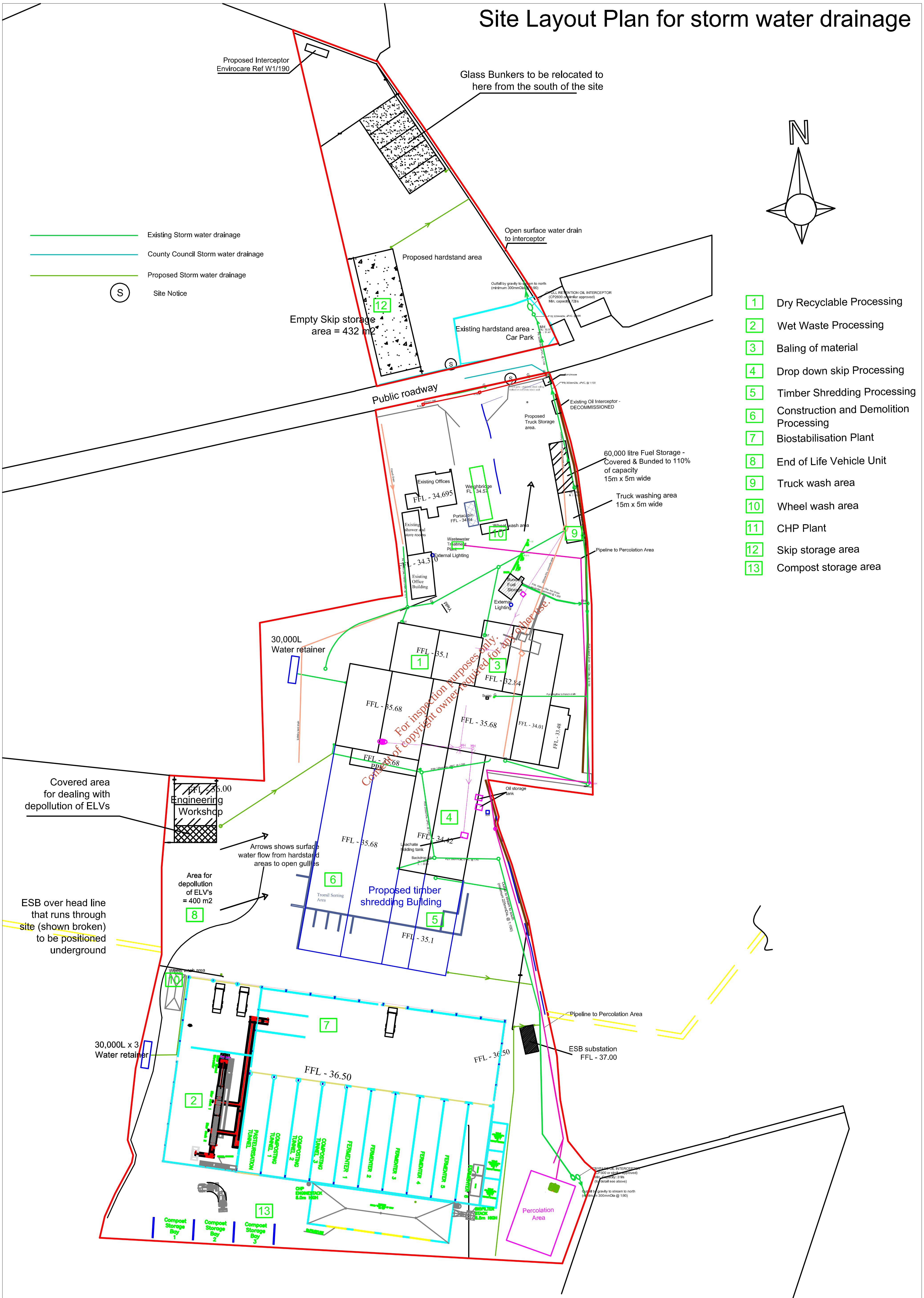
I.D.	Northing	Easting
Noise		
N1	102774	166146
N2	102720	166217
N3	102668	165874
N4	102795	165866
N5	102665	166078

PND	Page Title: Noise Monitoring Locations	Project: Clean Ireland Waste Licence Application	Client: Clean Ireland Refuse Ltd, Cree, Co. Clare	Drg. No. C(IRL)WL-25Rev1	Drawn by: Pádraig Neylon, B.Sc (Surveying) Benvoran, Cooraclare, Co. Clare.	Date: 20/ 11 / 09	Scale: A3 - 1: 1000	PND

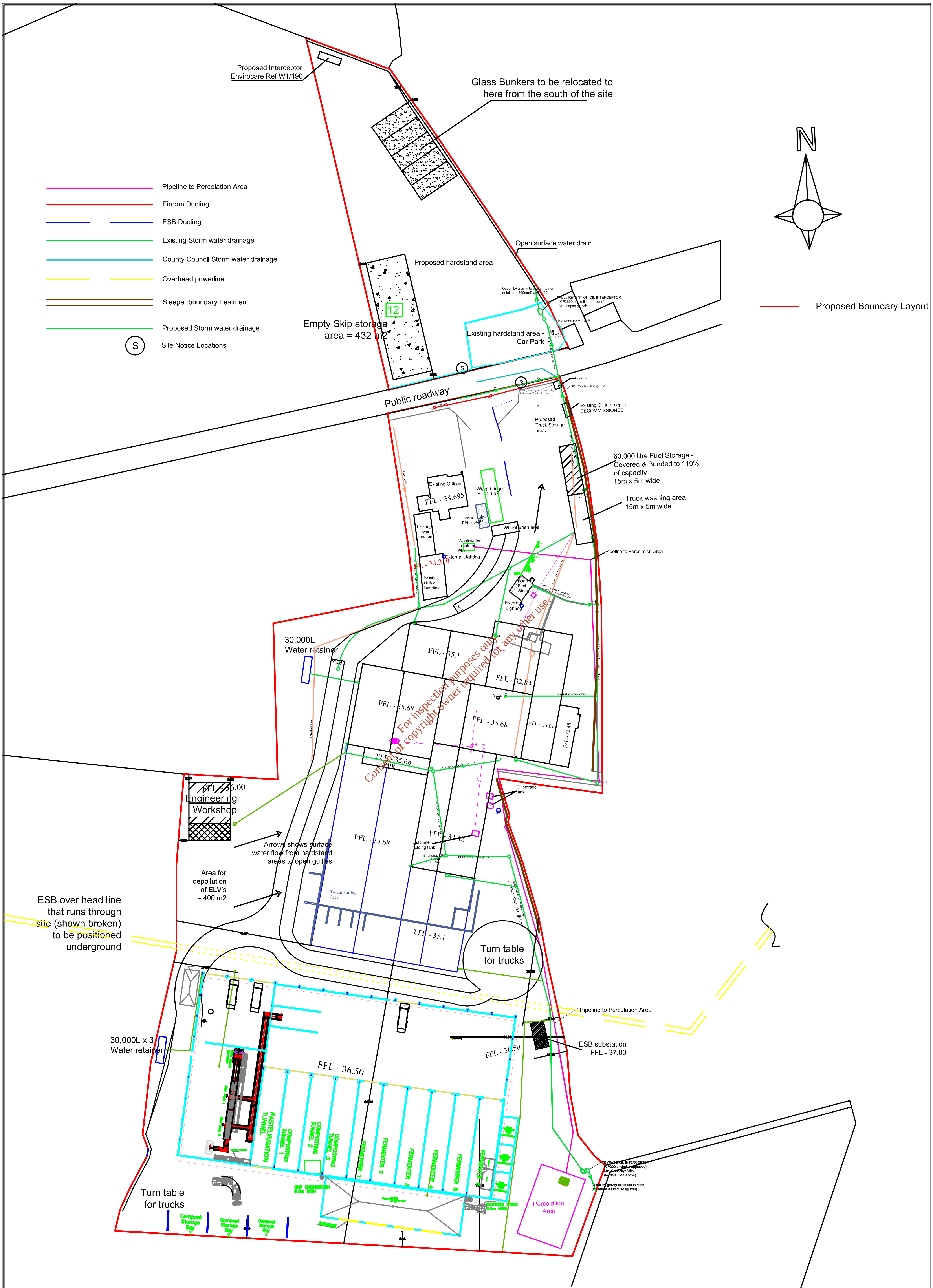
Site Layout Plan showing extent of hardstand areas



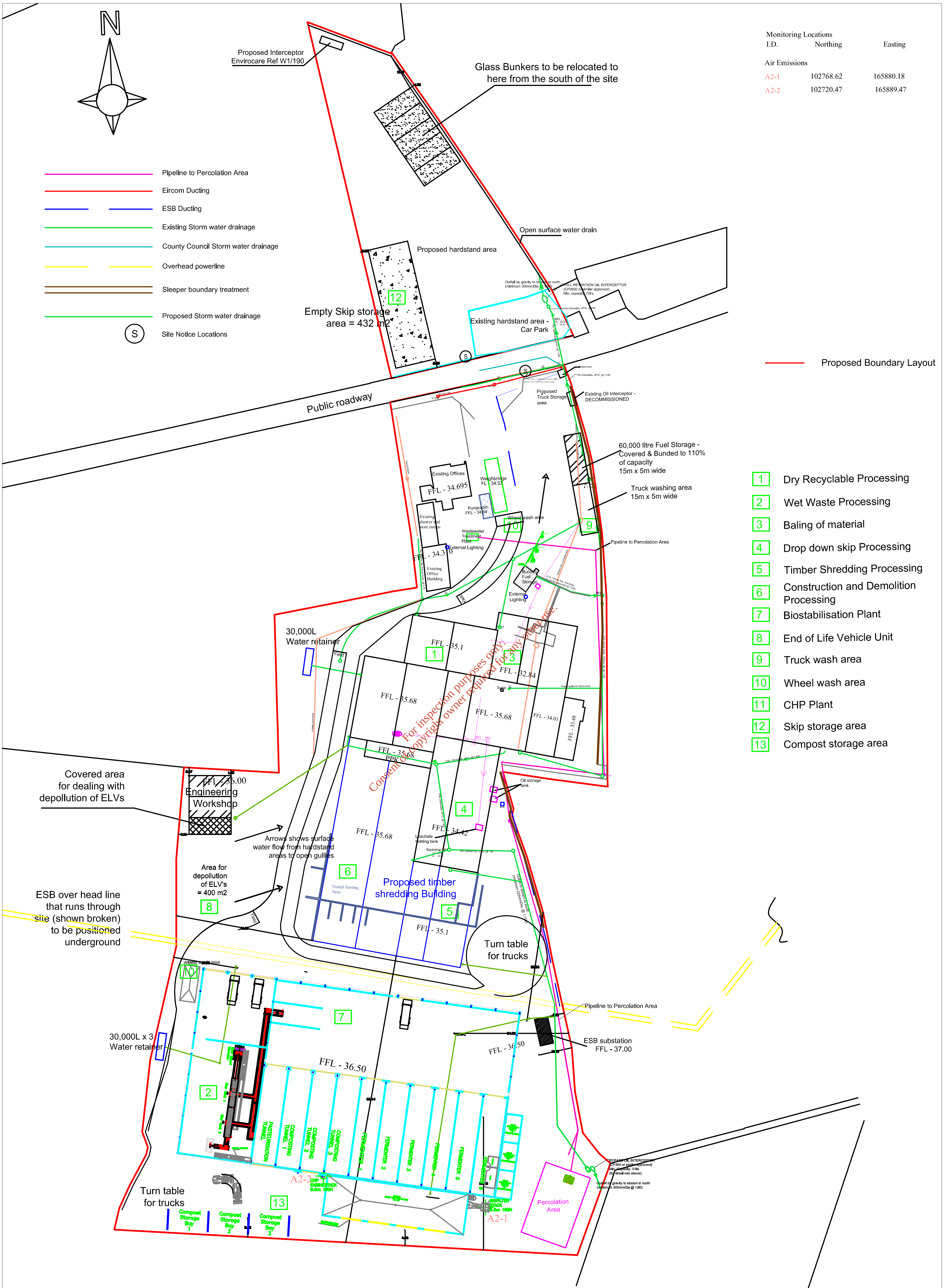
Page Title:	Project:	Client:	Drg. No.	Drawn by:	Date:	Scale:
Proposed Hardstanded Areas	Clean (Irl) Refuse & Recycling Ltd. Waste Licence Application	Clean Ireland Refuse, Cree, Ennis, Co. Clare	C(IRLWL-23Rev1	Pádraig Neylon, B.Sc (Surveying) Benvoran, Cooraclare, Co. Clare.	20 / 11 / 09	1 : 500



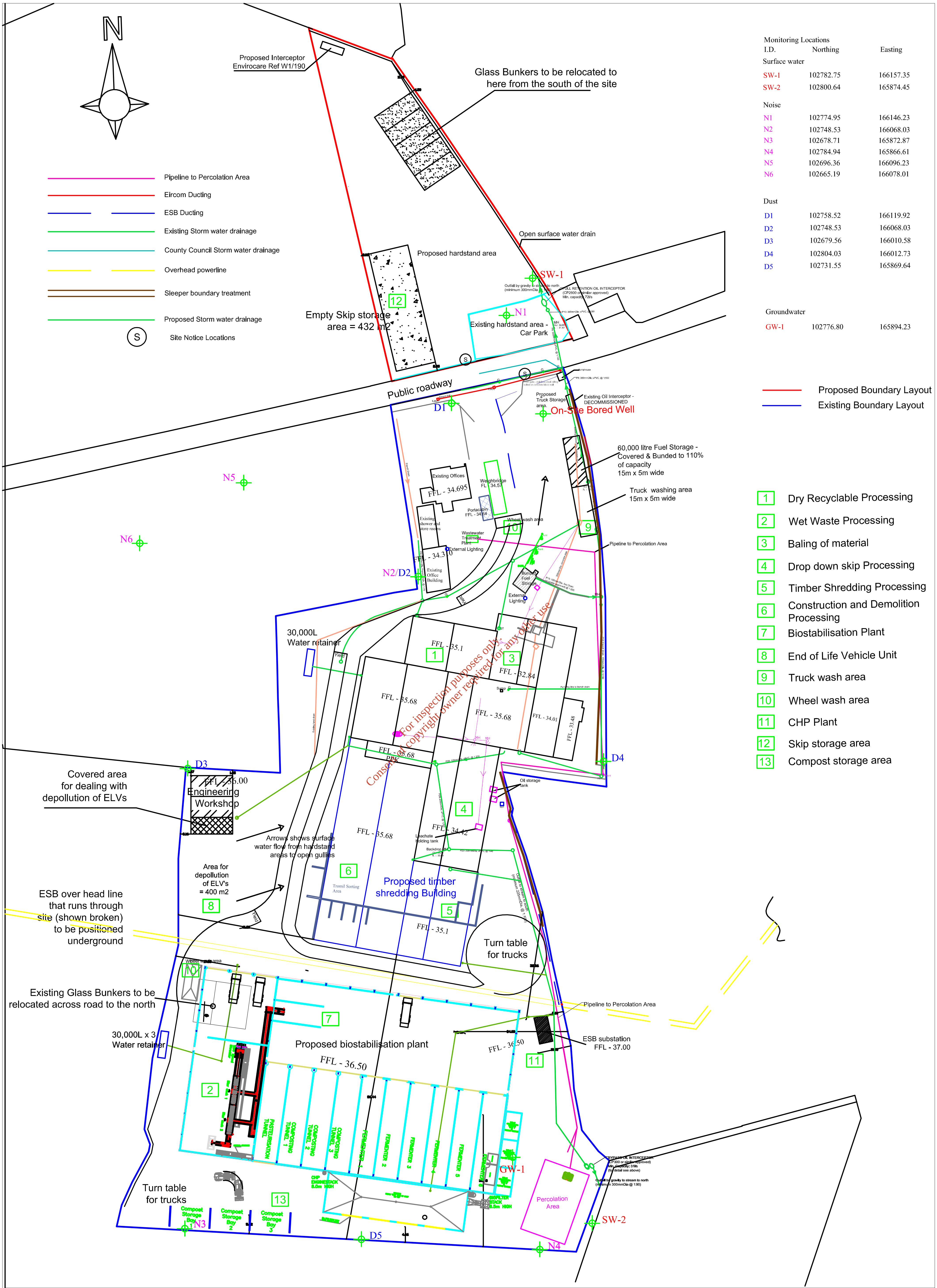
Page Title:	Project:	Client:	Drg. No.	Drawn by:	Date:	Scale:
Surface Water Drainage Plan	Clean (Irl) Refuse & Recycling Ltd. Waste Licence Application	Clean Ireland Refuse Ltd, Cree, Co. Clare	C(IRL)WL-19Rev1	Pádraig Neylon, B.Sc (Surveying) Benvoran, Cooraclare, Co. Clare.	20 / 11 / 09	A3 - 1: 1000



PND	Page Title: Services Plan	Project: Clean Ireland Waste Licence Application	Client: Clean Ireland Refuse Ltd, Cree, Co. Clare	Drg. No. C(IRL)WL-12Rev1	Drawn by: Pádraig Neylon, B.Sc (Surveying) Benvoran, Cooraclare, Co. Clare.	Date: 20 / 11 / 09	Scale: A3 - 1: 1000	PND



Page Title:	Project:	Client:	Drg. No.	Drawn by:	Date:	Scale:
Emissions to Air Monitoring Locations	Clean Ireland Waste Licence Application	Clean Ireland Refuse Ltd, Cree, Co. Clare	C(IRL)WL-10Rev1	Pádraig Neylon, B.Sc (Surveying) Benvoran, Cooraclare, Co. Clare.	20/ 11 / 09	A3 - 1: 1000



Monitoring Locations

I.D.	Northing	Easting
Surface water		
SW-1	102782.75	166157.35
SW-2	102800.64	165874.45
Noise		
N1	102774.95	166146.23
N2	102748.53	166068.03
N3	102678.71	165872.87
N4	102784.94	165866.61
N5	102696.36	166096.23
N6	102665.19	166078.01
Dust		
D1	102758.52	166119.92
D2	102748.53	166068.03
D3	102679.56	166010.58
D4	102804.03	166012.73
D5	102731.55	165869.64
Groundwater		
GW-1	102776.80	165894.23

PND

Page Title: Existing Monitoring Locations

Project: Clean Ireland Waste Licence Application

Client: Clean Ireland Refuse Ltd, Cree, Co. Clare

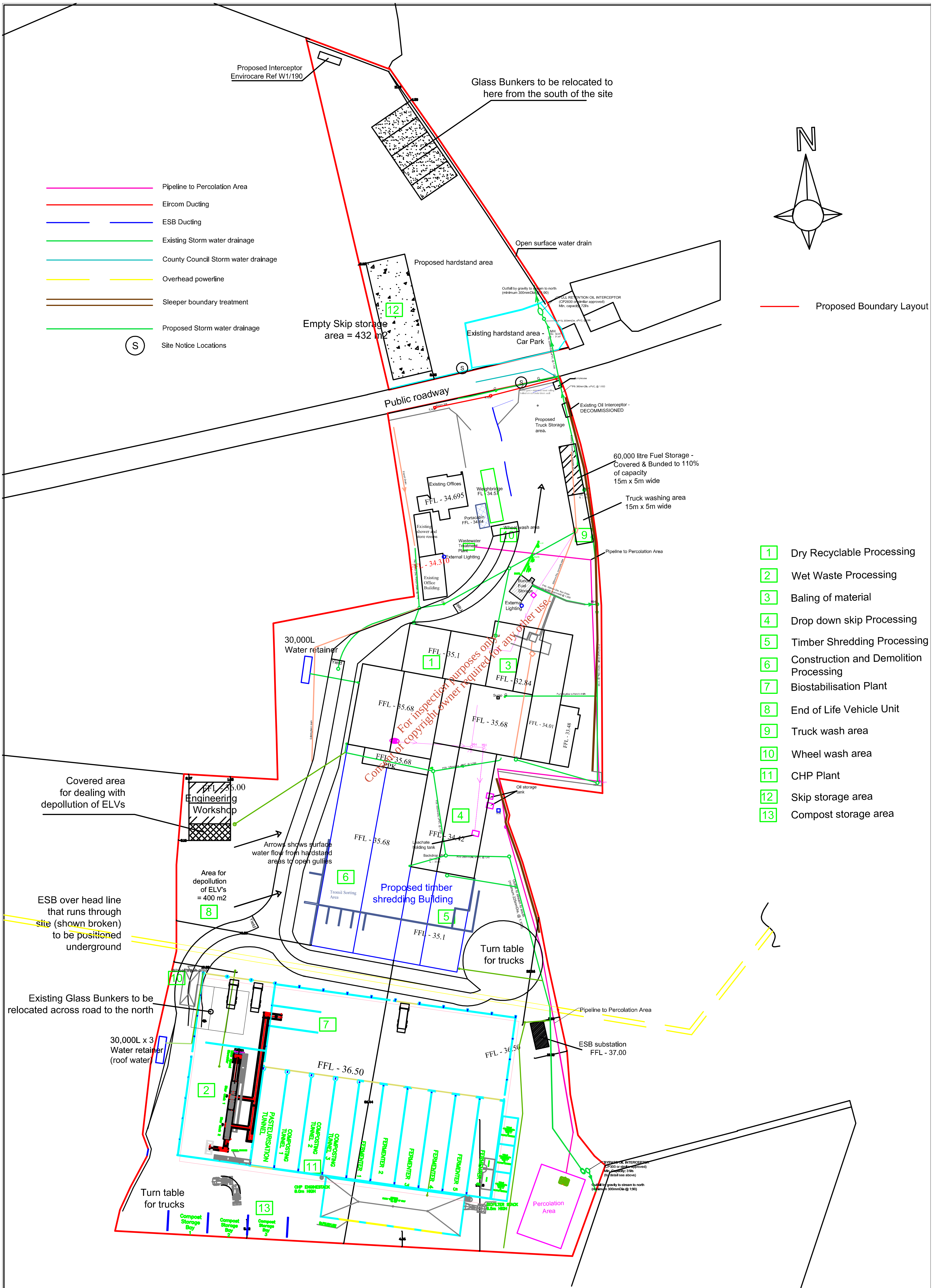
Drg. No. C(IRL)WL-06 Rev 2

Drawn by: Pádraig Neylon, B.Sc (Surveying) Benvoran, Cooraclare, Co. Clare.

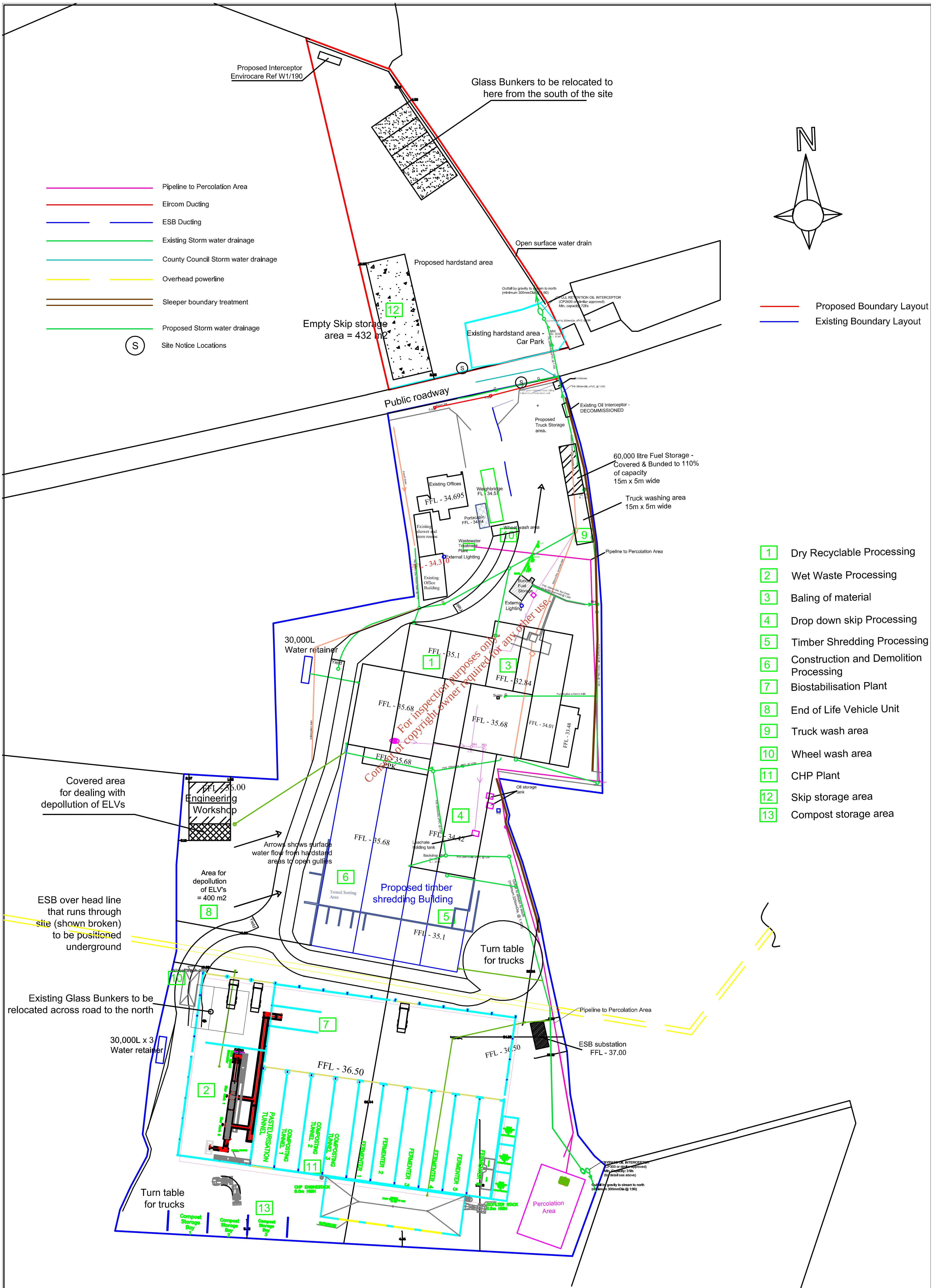
Date: 20 / 11 / 09

Scale: A3 - 1: 1000

PND



PND	Page Title: Existing Site Layout Plan	Project: Clean Ireland Waste Licence Application	Client: Clean Ireland Refuse Ltd, Cree, Co. Clare	Drg. No. C(IRL)WL-02Rev1	Drawn by: Pádraig Neylon, B.Sc (Surveying) Benvoran, Cooraclare, Co. Clare.	Date: 20 / 11 / 09	Scale: A3 - 1: 1000



PND	Page Title: Existing Site Layout Plan	Project: Clean Ireland Waste Licence Application	Client: Clean Ireland Refuse Ltd, Cree, Co. Clare	Drg. No. C(IRL)WL-01Rev1	Drawn by: Pádraig Neylon, B.Sc (Surveying) Benvoran, Cooraclare, Co. Clare.	Date: 20 / 11 / 09	Scale: A3 - 1: 1000	PND

CIR20 - 128

REV: 02

Biostabilisation Plant Operation CIR20-128

Clean (Irl) Refuse & Recycling Co. Ltd

Ballinagun West,

Cree,

Co. Clare

Tel: (065) 9059092

Email: cleanirl@iol.ie

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Originator ……………………..

Signed of by …………………..

Date Released…………………

Purpose

0

To outline the process for operation of the Biostabilisation Plant

Scope

Biostabilisation Process

Reason For Issue

First Release

Responsibility

Operational Director

Waste Quantities and European Waste Codes (EWC)

The proposed development is a combination of wet and dry AD designed to process the following

16,000 tonnes of MSW converted to 8,000 tpa of MBT fines (EWC 20 03 01)
4,000 tpa of domestic source separated food waste (EWC 20 01 08)
3,000 tpa of commercial source separated food waste (EWC 20 01 08)

Overview of Waste Flow

The facility is designed to treat both source separated and mixed waste feed stocks. As such, the incoming feedstock will be either directed to the biological building in the case of source separated material or to the mechanical pre-processing building in the case of MSW. Referring to Figure 3 and Figure 4 the following paragraphs will explain the process and waste flow. A more detailed explanation of each step within the process is given in the subsequent sections on dry AD and composting.

The brief mass balance for the MSW and bio-waste inputs to the facility is illustrated in Figures 1 & 2.

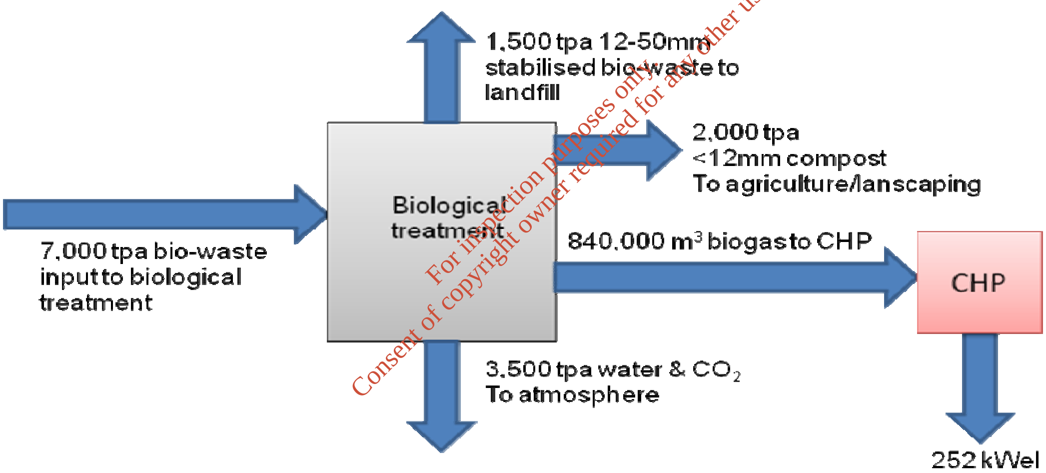


Fig. 1. Mass balance for the bio-waste inputs to the Clean Ireland facility.

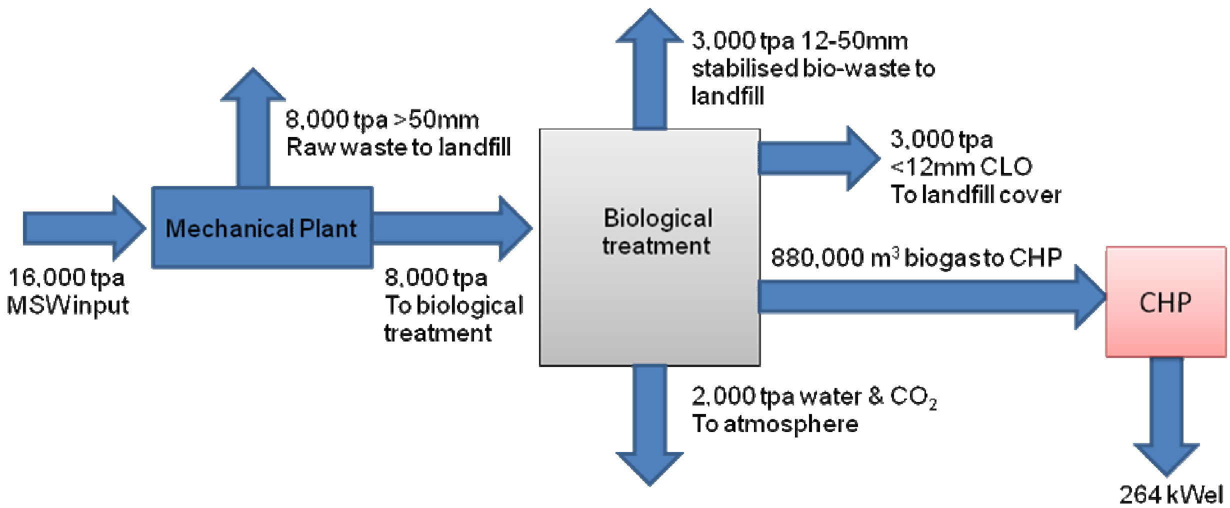


Fig. 2. Mass balance for the MSW inputs to the Clean Ireland facility.

Waste Reception and Pre-Treatment

The reception and pre-treatment of the bio-waste will occur within the waste reception building. The reception and pre-treatment method employed will vary depending on the incoming feedstock.

MBT Fines

The MBT fines consist of organic rich material that is mechanically extracted from mixed waste delivered to the facility. The mixed waste is shredded and screened at 50mm within the MRF section of the facility and the fines (Fig. 3) are conveyed to the biological building by conveyor. These fines are destined for the dry AD processing stream and will be delivered to the facility in a form that will not require any further pre-processing. The MBT fines will be stockpiled in a dedicated section of the reception building until such time as the volume of feedstock is sufficient to half fill a fermentation chamber (225-325 m^3).

Fig. 3. MBT fines currently being produced at the Clean Ireland MRF.

Domestic Co-mingled Food & Green Bio-Waste

The combined domestic food and green bio-waste feedstock will be delivered to the biological facility by refuse lorry in a form directly suitable for dry AD. Consequently, this material is directly tipped onto the reception building floor and then contained within a dedicated reception area (Fig. 4). As was the case with the MBT fines, this material will be stockpiled in the reception area until such time as there is an adequate supply to make a 50-50 mixture with the partially fermented contents of a recently unloaded fermentation chamber.

Fig. 4. Bio-waste being tipped at the Broadpath in-vessel composting facility in Devon (left) and material being held prior to processing (right).

Dry Anaerobic Digestion System

Introduction

Dry digestion is well suited to dealing with stackable bio-waste with lower moisture levels, i.e. >20% total solids (TS). These stackable materials can also have high levels of physical contamination and as a result dry anaerobic digestion is ideally suited to the processing of co-mingled brown bin material and MSW fines. In this system the incoming feedstock is loaded into "garage" like gas tight biocells using a loading shovel with little or no pre-processing required. These biocells are referred to as fermentation chambers. A summary schematic of the dry fermentation process is illustrated in Fig. 5. In brief, bio-waste or MBT fines are loaded into a sealed, gas tight concrete vessel and the anaerobic digestion (AD) process is initiated through the spraying of activated anaerobic percolate onto the biomass. This percolate is kept in circulation through an external percolate storage system. The biomass is heated to 37-40^{o}C and biogas production is facilitated. This biogas is drawn off the tunnels and stored prior to use as fuel in a CHP gas engine.

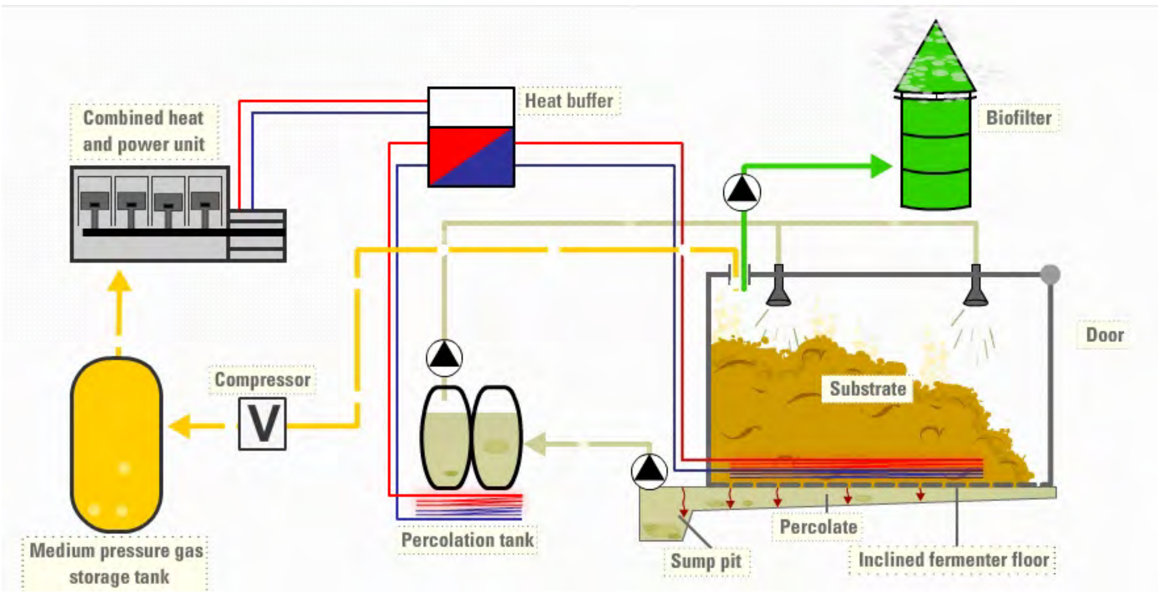


Fig. 5. Schematic of the BIOFERM dry fermentation process.

The system is modular with increasing tonnages of material being managed by additional fermenters. The fermenters are typically 30m long, 7m wide with an internal stacking height of 3.5m. Each fermenter can typically process 2,500 tonnes of bio-waste per year. Due to the cyclical nature of the biogas production process, the minimum number of fermenters is three. This ensures that there is always biogas available to feed the CHP (Fig. 6).

The process of dry fermentation is based on the following procedural steps:

1. Supply and storage of biomass
2. Fermentation
3. Extraction of digestate
4. Ventilation system
5. Gas utilisation

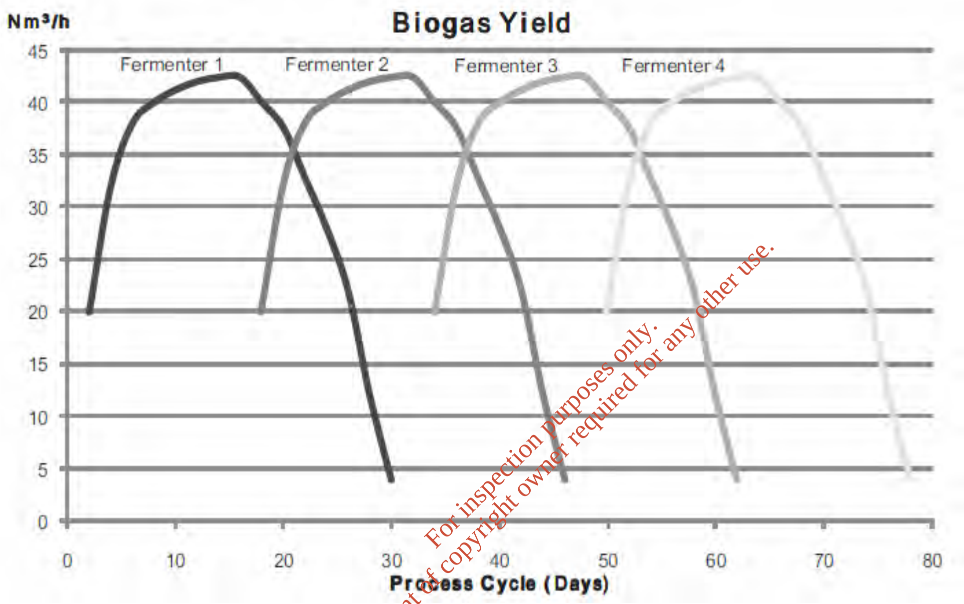


Fig. 6. Typical biogas production cycle from a four fermenter facility.

Supply and Storage of Biomass

When the plant is operational the supply of biomass to the fermentation chamber is based on a 28 day cycle. When a chamber is ready for fresh biomass the first step of the exchange requires the extraction of the partially fermented biomass within the chamber. One portion of the extracted biomass is kept on the building floor and then mixed in an approximate ratio with fresh biomass using a front loader. This ratio will be dictated by the tonnage of material being delivered to the facility and may fluctuate to accommodate seasonal peaks but is expected to be a 50-50 split. The loading and unloading of the solid state digestate is conducted using air-conditioned loading shovels (Fig. 7).

Fig. 7. Filling of a fermentation chamber with Bio-waste.

The Fermentation Chambers

Each of the individual fermentation chamber units has an inner floor area of 7m x 30m with an internal height of 5m (Fig. 8). The height of the stacked biomass however, must not exceed 4.0 meters and this is typically managed at 3.5m. The reinforced concrete fermentation chamber is gas tight to prevent the infiltration of oxygen (the presence of which would cause the methane producing bacteria to become inactive). This also prevents the leakage of biogas to the atmosphere. An in-floor heating system holds the biomass at a constant temperature range of between 37-40°C. The plant engineering components are located in a dedicated technology section housed above the fermenters. The capture and storage of biogas is managed through a stainless steel piped biogas ventilation system while short to medium term gas storage bags are also located above the fermentation chambers. The percolate from the fermenters is stored in two insulated and heated tanks.

Fig. 8. Interior of fermenter prior to filling (left) and with bio-waste prior to fermenter sealing.

To insure that the fermentation chamber is not opened before the methane gas is completely drawn from the chamber and safe atmospheric levels of O_2, CO_2 and H_2S are reached, the air inside the chamber is continuously measured and analysed. The values are communicated to the computerized security system controlling the chamber doors. With the exception of loading and unloading biomass from the fermentation chambers the entire plant is fully automated by PLC. Interruptions are immediately recognised and documented.

The Percolate Cycle

The dry fermentation process is facilitated by the "percolate cycle". This involves the spraying of the biomass with an activated anaerobic sludge that is developed in a separate heated tank. This percolate inoculates the biomass while keeping it moist (>70% moisture; <30% solids). While the process of hydrolysis is initiated during storage of the fresh biomass within the reception building, both acidogenisis and methanogenesis steps occur simultaneously within the fermenter. The bathing of the biomass in this activated percolate is key to the process.

In order to drain off excess percolate, a series of stainless steel gutters of 1 m length each with grating are built into the fermentation chamber floor. They absorb excess liquid from percolate sprinkling and route it in a controlled way to a gas tight pipe collection system. From the collection pipes the percolate is routed to the insulated covered transfer pump duct (10 m^3) utilising the following equipment:

- Fill level sensor to switch the lift pump
- Transfer pump (mix pump) with pressure pipe to the percolate storage unit
- Ventilated air pipe
- Temperature sensors
- Access door
- Limit Switch

From the transfer pump duct, which is already equipped with a 3-layer coating and a leakage detection system, the fermentation liquid is pressure pumped into an insulated percolate storage unit (Fig. 9). The entire piping system is routed in a frost-proof zone outside the fermentation chamber area. The percolate storage unit consists of the following parts:

- Inlet pipe end
- Filling level sensor to switch the pump
- Transfer pump (mix pump) with pipes to the chamber sprinkling system
- Water tank for excess pressure safety
- Heating (Wall heating)
- Temperature sensor
- Pressure sensor
- Access door
- Limit switch
- Fermentation chamber connection unit

This percolate storage unit is installed with capacity to hold enough percolate for the entire fermentation process (even in the case of dry or highly structured material) where excess water may need to be added. The percolate storage unit is heated via a heat exchanger attached to the CHP unit. A temperature meter is located in the storage unit and takes real time percolate temperature measurements. By doing this, the heat circulation pump can be controlled and when necessary turned on/off.

The percolate is pumped to the individual fermentation chambers via HDPE pressure pipes. The percolate pipes route to the sprinkling unit of the fermentation chambers through gas tight ceiling ducts. A time sensitive control system determines the maximum percolate sprinkling requirement of the biomass. The cycle comes to an end when the percolate has seeped through the biomass. The remaining bacterial fluid is collected, siphoned and then transported using the transfer pump duct. This is to ensure that the percolate cannot leave the system in an uncontrolled manner. Should the gauge in the percolator storage unit fall below the minimum level required for fermentation of exceptionally dry biomass, fresh water can be applied to the biomass. As a general rule the percolate level should be balanced as the percolate is recycled and stored in the final storage chamber.

Fig. 9. Percolate storage at a Bioferm facility in Japan.

Heating

Less than 5% of the heat generated from the CHP engine is utilised to maintain the working temperature within the fermenters; the rest can be used for external purposes. The thermal energy from the CHP engine is passed to a heat-exchanging device whose operating temperature averages around 85°C. By means of heat pumps, warm water is channeled though the heating system of the biogas plant. The fermentation system is conducted at mesophilic temperatures of around 37-40° C. Heat is transported through stainless steel pipes. The fermentation chamber floor is equipped with heat piping so that the temperature of the fermenting material is maintained at 37-40° C. The placement of the heat distributor alongside the heat in-feed of the percolate storage units ensures against excess heat exchanges.

Pneumatic Controls

The compressor produces the required compressed air to activate all pneumatic valves and it is regulated with an on/off switch. The air pressure lines are routed to a distribution manifold to facilitate individual valve requirements. In the case of pressure loss or a controlled emergency stop, all pneumatic valves are depressurised automatically through a closing mechanism, using the spring-break principle, thus securing the plant in a safe operating state and preventing uncontrolled gas leaks. Pneumatic valves are activated by the air pressure from the respective chambers: The chamber door is manually opened and closed. When the door is closed, it is pneumatically locked. Compression couplings generate the necessary surface pressure and use it to assure the chamber remains gas tight. In order to open the fermentation chamber door, clamping screws require loosening and a pneumatic release device needs to be operated by hand. Only when gas quantities of ≤ 3 % CH_4, < 0.5 % CO_2 and > 18 % O_2 are measured in the fermentation chamber is approval to open the door given via the PLC system (green indicator on control panel). The pneumatic lock on the chamber door can then only be opened with a key. There is a finite time limit within which the chamber door must be opened. If the door is not opened during the allowed time a new approval sequence must be given by the PLC control system based on the content of methane and oxygen in the fermentation chamber.

Gas Measurement and Storage

After loading the fermentation chambers, the biomass is kept undisturbed for a period of approximately four weeks, during which time the biomass is anaerobically fermented and biogas is produced. The gas quality (CH_4, CO_2, H_2S and O_2) is determined with a gas analysis device and communicated to the PLC system and the Siemens SCADA software interface (Figs. 10 & 11). The plant operating parameters such as temperature, pressure, gas quantity and quality are stored in a database. Percolate quantity, valve and plant conditions (fermentation chamber, gas storage, CHP) are monitored via the PLC.

The biogas is extracted from the chamber with an explosion and leak proof ventilation mechanism and it is routed into the gas storage unit located on top of the fermentation chambers (Fig. 12). The internal pressure of the gas storage unit under normal operating conditions is maintained at a maximum of 5 mbar. For safety reasons the internal pressure of the gas storage unit must never exceed 25 mbar. This is controlled by the PLC with a further mechanical pressure relief valve that routes the excess biogas to a flare. The gas storage bag is designed with enough capacity to buffer the biogas even during offline maintenance works on the degasification units of the plant or the CHP unit. When the degasification unit or the CHP unit comes back online the buffered gas can be reprocessed. Under normal operation the gas storage units are loaded to a maximal of 30 - 40 % of capacity via the level control sensor to guarantee enough buffer capacity for operational disturbances.

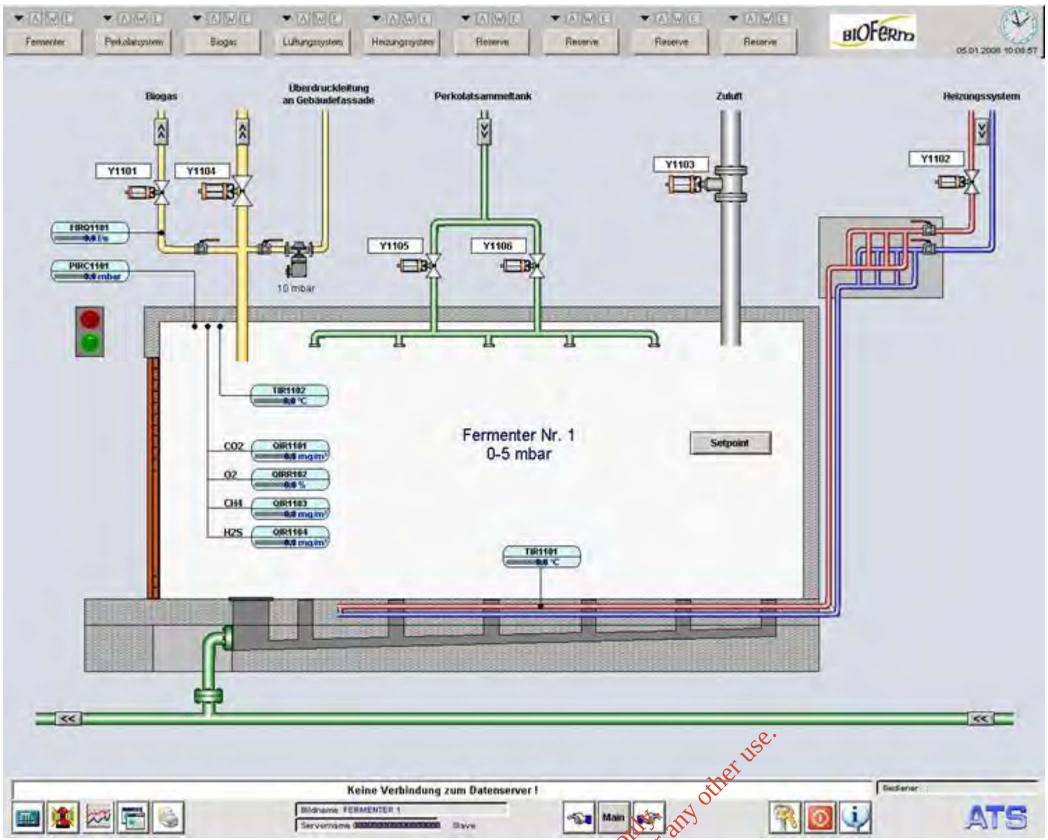


Fig. 10. Siemens SCADA control of fermenter No.1 at the Moosdorf facility in Bavaria.

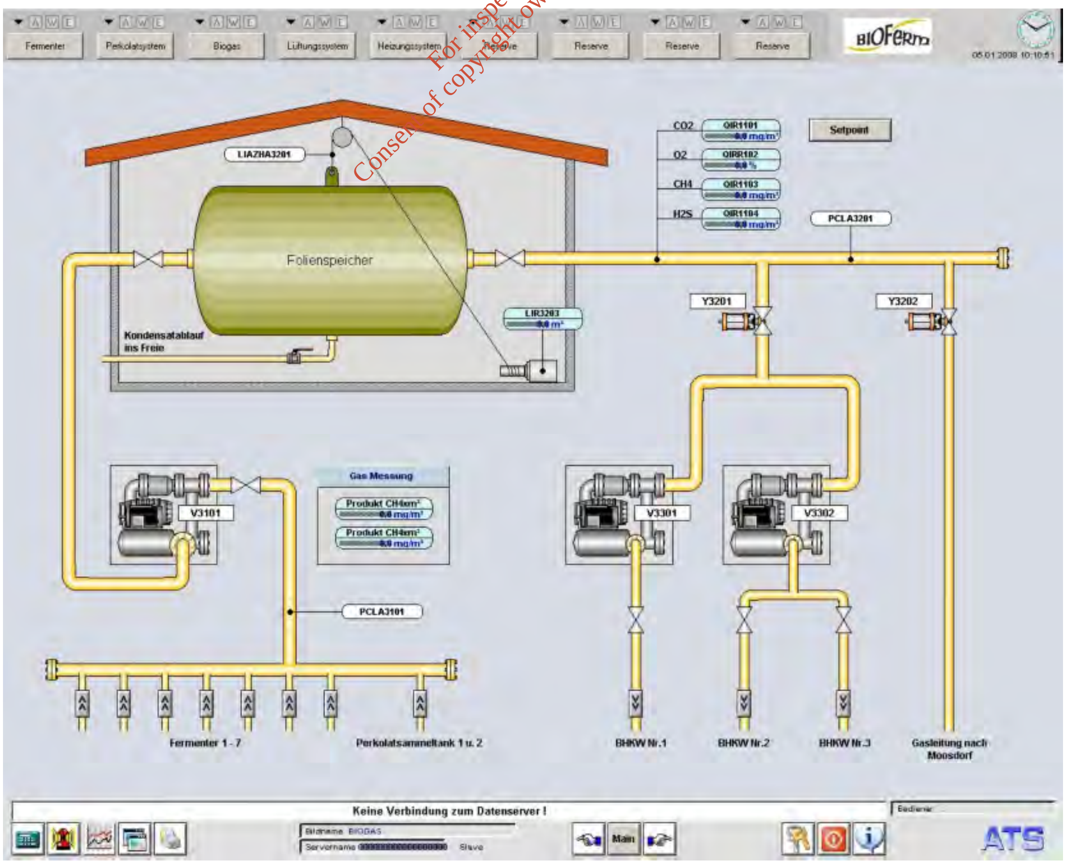


Fig. 11. Siemens SCADA control of gas storage at the Moosdorf facility in Bavaria.

By mixing the streams of gas from different fermentation chambers a gas with consistent methane content is produced. Due to this process the methane content of the mixed gas will be the average of the combined fermentation chambers thus achieving higher process stability. A minimum mixed gas methane content of 57% is aspired to. The desulphurisation of the gas is achieved automatically by the PLC control system. A hydrogen sulfide level of less than ≤ 100 ppm is desired. The moist biogas stays in the gas storage unit for a period of time while cooling to ambient temperature. During this process the water in the gas condenses and is transferred via a siphon water duct (150 mm) from the deepest point of the gas storage unit to the fermentation chamber below. This is process is referred to as passive condensation extraction. Further biogas production takes place in the percolate storage tank. A connection to a fermentation chamber is installed on the ceiling of the percolate storage tank and the biogas is exhausted via a gas compressor. The gas is condensed and routed to the gas storage unit.

Continuous measurement of CH_4, CO_2, H_2S and O_2 levels and gas volume for each individual fermentation chamber as well as the volume and composition of the mixed gas in the gas storage unit is carried out to monitor the line operation. This is essential for optimal control of all processes and any interruptions can be detected and prevented at an early stage.

Fig. 12. The pneumatic gas collection system on the roof of the fermenters (left) and the gas transfer blower to the gas bag located in the roof space above the fermenters (right).

A fermentation chamber gas extraction unit consisting of the following components is attached to each fermentation chamber on a gas tight ceiling conduit:

- Valve to the CHP
- Valve for the gas collection pipes with gas meter.
- Hydraulic safety valve for vacuum and pressure gauge

Fermenter Ventilation System

The ventilation system provides sufficient ventilation for the fermenter chamber opening process. Ventilation is accomplished with a controlled piping system (stainless steel, resistant to methane gas and electrical conductivity), backpressure valves and ventilation units. The exhaust air within the fermentation chamber is combined with compost exhaust and the building air which is ultimately discharged to the atmosphere via a bio-filter.

CHP

The CHP unit is supplied with biogas from the respective gas storage units via an individual gas control valve and gas compressor. The CHP units are installed in a separate, noise dampened containerised unit (Fig. 13). The electricity produced by the CHP units is fed into the public grid and/or used for internal consumption. The thermal energy generated by the CHP units is needed in small amounts as process heat (approx. 5 %) in the plant (in-floor heating of dry fermentation chambers, heating of buildings etc.); the surplus thermal energy can be provided for external thermal use. In cases where the thermal energy is not used, the CHPs are equipped with a standard emergency cooling mechanism.

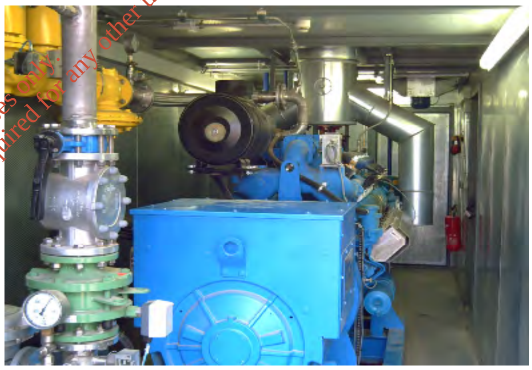


Fig. 13. Containerised CHP at the Decker biogas plant in Northern Germany

The accessories to the gas engines include the compressors, fire and smoke detectors within the room, a separate electrical control cabinet and remote control that enable the supplier to check the biogas engines on a daily basis or according to requirements. Exhaust gas emissions will be in accordance with European standards. Details can be adjusted for local requirements. Noise and exhaust gas quality are based on European regulations. All the safety design is according to German Safety Regulations for Agricultural Biogas Plants. In a situation where the gas engines are out of operation due to maintenance or repair, an emergency flare burns the surplus biogas. The emergency flare has a fully covered flame and is automatically turned on by the level control of the gas holder. It burns biogas at about 800 – 850 °C and follows international standards for this duty.

In-Vessel Composting System

The Compost Tunnels

Three aerobic tunnels are provided (30m x 7m x 5m) to post process the dry AD fermenter output for both the MBT and source separated outputs from dry fermentation. The tunnels are constructed from re-enforced concrete designed to withstand strong chemical attack and high abrasion (Fig. 14). They are sealed by insulated stainless steel lined sliding doors. The tunnels are equipped with a proprietary "C:N" aerated floor system with a computer controlled blower system that is mounted in a gallery on the roof of the tunnels overlooking the tunnel loading area. Approximately 50% of the output from the fermenters is transferred to the aerobic composting tunnels on each cycle and the material is mixed with screen overs to inoculate the material with aerobes.

This material is then stacked within the composting tunnels and aerated. The material readily de-waters and the aerobic microbial population rapidly increases. This is reflected by the auto-thermic increase in temperature of the biomass into the thermophilic range.


Fig. 14. Exterior of the composting biocells illustrating the sliding doors (left) and the proprietary C:N in-pavement aeration system (right).

Control of the Composting Process

The composting process for the tunnels is controlled by a PLC / PC interface, which dictates the airflow within the biomass. The flow of air responds to temperature, pressure and oxygen changes in the composting mass that are continuously recorded by the PLC.

At the beginning of the process, when the composting mass is heating up, the computer system is in "oxygenation" mode. Here the process control system is programmed to blow air into the vessels on a periodic basis to maintain adequate oxygen levels and stimulate the growth of aerobic bacteria. A diagram of the aeration system is illustrated below. The blower system is illustrated in Fig. 16.

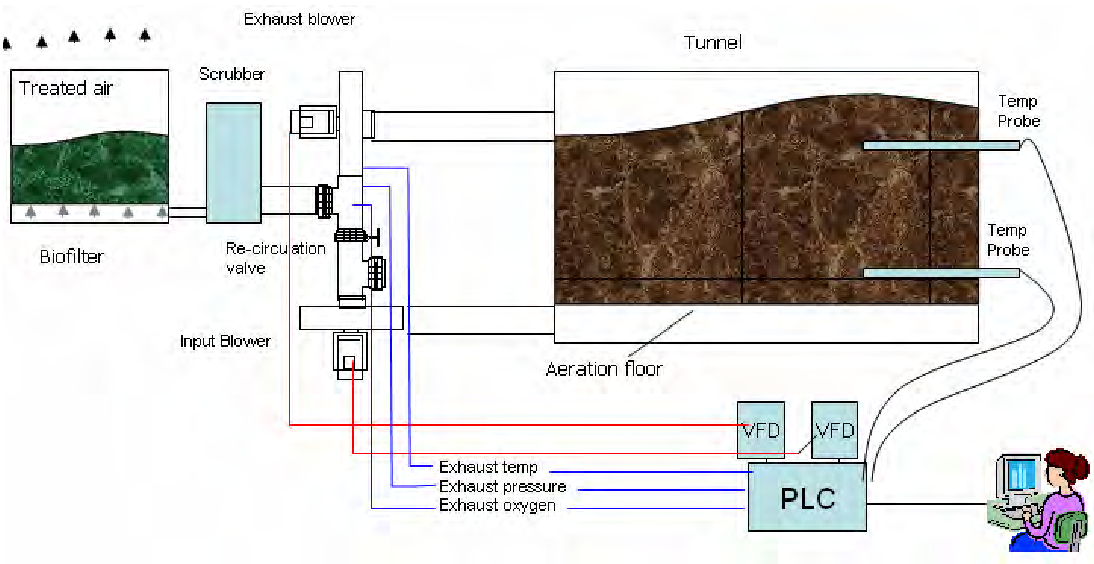


Fig. 15. Schematic of the CCS PLC controlled biocell aeration system.

The PLC coupled with a windows based PC computer allows the operator to configure a temperature profile for the 14-28 days of post fermentation composting and bio-drying. This allows the temperature within the biomass to be controlled within set limits while excess moisture is driven off. Typically the compost would be turned within 7-10 days to break up compaction during this aerobic stage. At the end of this period, a compost at Rottgrade IV will be produced with a moisture content of 35-40% that is then retrieved from the composting tunnels for screening.

Fig. 16. The blower modules in the gallery of the Deepmoor tunnel composting facility in Devon.

Compost Screening

The screening plant is housed within the building to ensure that there are no fugitive emissions of odorous air during the screening operation (Fig. 17). In order to achieve ABPR compliance, both MBT and source separated materials will be screened at 12mm. The overs from the MBT line will be landfilled as stabilised bio-waste, while a proportion of the source separated overs will be used to inoculate the digestate prior to tunnel composting. The unders from the 12mm screen will be segregated for pasteurisation.

Fig. 17. Housed trommel screen illustrating multiple sections that produce different grades of compost and overs.

Compost Pasteurisation and Storage

The trommel screen will produce a fine grain 12mm compost fraction from both MBT and source separated lines. This material will be loaded into a dedicated pasteurisation tunnel that is aerated under maximum re-circulation. Recently screened compost will generate a short period of increased microbial activity due to the physical abrasion resulting from screening. As a result, this compost will reach high temperatures (60-80^{o}C) in the following days if oxygen is supplied. This is facilitated within the controlled tunnel environment and while temperatures in excess of 70^{o}C can be expected in the following 48 hours, additional heat can be introduced from the CHP heat exchanger that is connected to the input blower as a fail safe feature.

After the pasteurisation set points have been achieved, the blowers automatically revert to heat exchange mode to bring the temperature down and thus facilitate further mesophillic maturation during the remaining 4-7 days. This also ensures that when the compost is retrieved from the back door of the pasteurisation tunnels odour is all but eliminated.

An area at the back of the facility has been designated for compost storage prior to release off site. The area will allow for approximately 2-3 weeks of compost storage to allow quarantine and seasonal demand issues (Fig. 18).

Fig. 18. Compost storage at the Waterford city Compost facility.

ABPR Compliance

The Animal By-Product Regulation (ABPR) was introduced into European legislation in 2002 on the back of concerns over exotic animal diseases such as foot and mouth and BSE. Regulation (EC) No. 1774/2002 of the European Parliament and of the Council of 3 October 2002 lays down health rules concerning animal by-products not intended for human consumption. This regulation defines animal by-products as *"entire bodies or parts of animals or products of animal origin… not intended for human consumption".* A distinction is drawn between the measures to be implemented in the use and disposal of the material concerned, depending on the nature of animal by- products involved.

Under the Regulation

- A composting plant is defined as *"a plant in which biological degradation of products of animal origin is undertaken under aerobic conditions"* and
- A biogas plant is defined as *"a plant in which biological degradation of products of animal origin is undertaken under anaerobic conditions for the production and collection of biogas".*

Article 15 of Regulation (EC) No. 1774/2002 requires that biogas plants and composting plants shall be subject to veterinary approval by the competent authority. Under Article 6 of S.I. 248 of 2003, the European Communities (Animal by-products) Regulations 2003 which implements the above Regulation, the Minister at the Department of Agriculture, Fisheries and Food (DAFF) may grant an approval, attach conditions to an approval, revoke or vary a condition, withdraw an approval or refuse an application.

As described in Section 1.8, the option of processing the compost at the back end in accordance with EU 1774 is being pursued. In this configuration, the incoming bio-waste is managed in the fermenters and biocells in accordance with best composting and fermentation practice. At the end of this process and as described, the material is screened @ 12mm and this fine grade material is placed in flow through tunnels that facilitate the attainment of the 70^{o}C protocol with the aid of external heat from the CHP as required. This latter heat re-use option is a distinct advantage of the fermentation/composting configuration. The other advantage of this approach is that former foodstuffs can also be processed thus maximizing the band width of bio-wastes that can be accepted by the facility.

Other aspects of the ABPR that the facility design has addressed include the full enclosure of the building and process with stock-proof fencing around the full waste management facility. In addition, all personnel access doors will be fitted with foot baths.

In accordance with the requirements of the latest guidance document published by DAFF, Clean Ireland will undertake the process of phase 1 and 2 ABPR application based on this facility configuration including the development of the facility HACCP plan in parallel with the facility operators manual and SOPs. Once material is available for pasteurisation, there will be a requirement for the facility to pasteurise six concurrent batches and to produce temperature and pathogen data as part of the final license confirmation process. Specifically, Clean Ireland will expect the facility to achieve validation when six batches have been demonstrated to have achieved the time/temperature requirements of the ABPR and to have passed the *E.coli* and Salmonella testing requirements. This is expected to take approximately six months from the date of reception of the first waste loads.

Celtic Composting Systems have been retained to achieve the ABPR license for the facility having successfully delivered on licenses for Galway City Council, Waddock Composting and Waterford City Council compost facilities in addition to a range of facilities in the UK.

COMPOST QUALITY

COMPOST QUALITY (SOURCE SEPARATED MATERIALS)

A good compost quality is clearly a key requirement of this facility. Compost quality parameters can be broken down in a number of key categories:

(a) Maturity / stability
(b) Microbial sanitization
(c) Trace metal concentrations
(d) Nutrient content
(e) Level of physical contamination

Maturity
In relation to maturity, it is expected that the proposed Irish compost stability standard of 13mmolO_2/gVS/h will be achieved (Prasad & Foster, 2009). Typically, the source separated bio-waste will be subjected to approximately eight weeks of dry fermentation followed by three weeks of post composting giving a total retention time of 11 weeks. This retention time within a managed biological treatment system will ensure that the requisite level of maturity is achieved (Fig. 20).

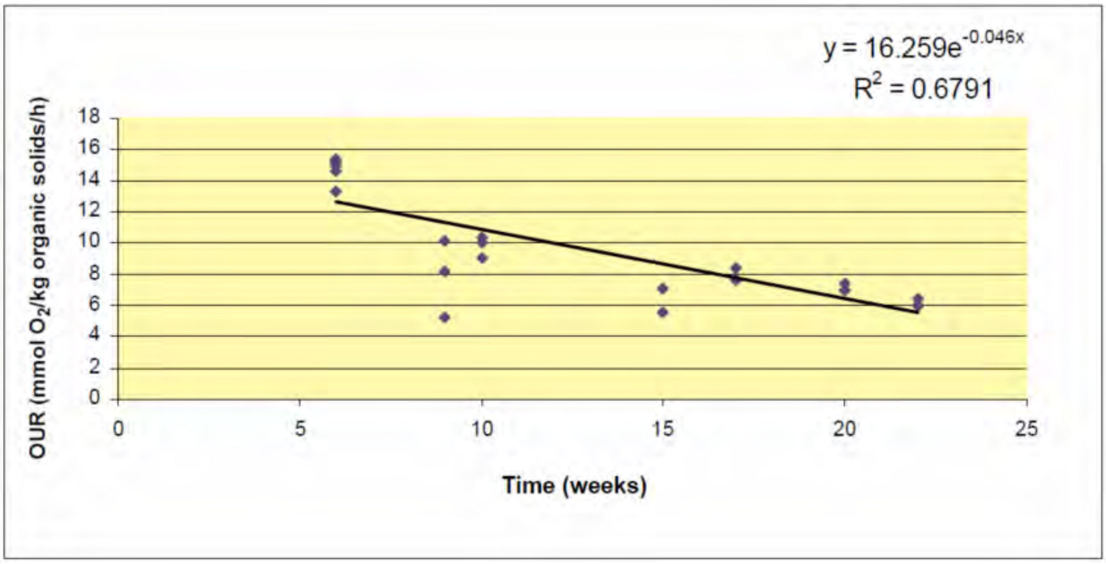


Fig. 19. Oxygen Uptake Rate (OUR) for compost against retention time (Prasad & Foster 2009).

Microbial Sanitation
This is specifically dealt with in accordance with DAFF Animal By-Products Legislation in relation to Salmonella and *E. coli* levels in the output compost product. The regulations state "Sampling must be carried out on digestive residue during or immediately after processing (i.e. immediately after processing parameters have been achieved) in the case of E.Coli, and during or on withdrawal from storage for Salmonella ".

Under the regulations the plant must comply with the following standards

Escherichia coli: n = 5, c = 1, m = 1000cfu, M = 5000cfu in 1 g;
or
Enterococaceae: n = 5, c = 1, m = 1000cfu, M = 5000cfu in 1 g;

and

Representative samples of the digestion residues taken during or on withdrawal from storage at the plant must comply with the following standards:

Salmonella: absence in 25 g: n = 5; c = 0; m = 0cfu M = 0cfu;

where:

n = number of samples to be tested;
m = threshold value for the number of bacteria; the result is considered satisfactory if the number of bacteria in all samples does not exceed m;
M = maximum value for the number of bacteria; the result is considered unsatisfactory if the number of bacteria in one or more samples is M or more; and
c = number of samples the bacterial count of which may be between m and M, the sample still being considered acceptable if the bacterial count of the other samples is m or less.

Trace metals

The concentration of trace metals in the final compost from facilities processing source separated bio-waste is directly linked with the concentration in the incoming material and a high correlation has been found between the level of physical contamination in the incoming bio-waste and the final compost. As a result, the control of this parameter is primarily the responsibility of the collector who is in a position to police the quality of the source separation schemes. In addition, it has been found that high levels of overs re-use containing plastics and metals has a detrimental effect on compost metal concentrations. As a result it is imperative that the >50mm fraction is removed from the process at every pass to avoid this material that contains much of the contamination from being re-processed. PVC has been identified as a particular problem in this regard. Facilities that have failed to do this tend to experience a noticeable increase in lead and zinc concentrations with subsequent issues as regards use of the final compost product.

Nutrient Content
While no standard has been set for these parameters, the data attached in Appendix 2 is for information. CCS uses the nitrate / ammonium ratio as a guide to maturity and process stability.

Physical Contamination
Similar to trace metals, physical contamination is a function of the quality of the incoming bio-waste. However, as the facility will not be using high speed shredders and will be screening the final product @ 12mm, this will preclude much of these contaminants, i.e. film and hard plastics, metals and textiles etc. The data attached illustrates that low levels of physical contaminants are possible as a result even from relatively contaminated bio-waste streams as has been experienced at the Waterford City and Galway City facilities.

COMPOST QUALITY (STABILISED BIO-WASTE)
The principal issue regarding the compost quality derived from mixed waste inputs is the stability of the output. Specifically, MBT is a process that is designed to biologically stabilise waste prior to landfill. Such stabilised wastes will have a substantially lower potential to generate landfill gas with resultant significant reductions in greenhouse gas emissions. In addition, the leachate strength from such material will be considerably lower than in the case of raw waste. In Ireland, the EPA has published a standard for stability:

'stabilisation' means the reduction of the decomposition properties of bio-waste to such an extent that offensive odours are minimised and that either the Respiration Activity after four days (AT4) is below 10mg O2/g dm or the Dynamic Respiration Index is below 1,000 mg O2/kg VS/h.

This standard must be met for qualifying waste in 2010 and is to be increased to **7mg O_2/g dm** by 2016 in accordance with the requirements of the EU Landfill Directive. The Clean Ireland facility is designed to achieve the 2016 standard given the design life expectancy of the facility (20 years). This increase in stabilisation as a result of the combined anaerobic and aerobic processing is illustrated in Fig. 21 below. The threshold illustrated is **5mg O_2/g dm** based on German standards. Given a design combined retention time of nine weeks, the Irish 2016 standard will be readily achieved.

The facility will produce two bio-stabilised products from the MSW stream. The first will be a 12-50mm material that will have been subjected to the full nine weeks of biological processing. This material will be destined for the landfill void as stabilised bio-waste in accordance with the EPA stability standards or will be thermally treated as a refuse derived fuel (RDF). The other product consisting of pasteurised <12mm compost will be used as a landfill cover. This material will not be used in agriculture, landscaping or horticulture due to the mixed waste nature of the origin material. The stability of this material will be the same as the coarse fraction. However, due to the fine grain nature of the material, the level of physical contamination is expected to be less than 3% by weight thus making it suitable for use as a cover material. Clean Ireland will also investigate alternative uses for this material for bio-remediation purposes in accordance with EPA guidance.

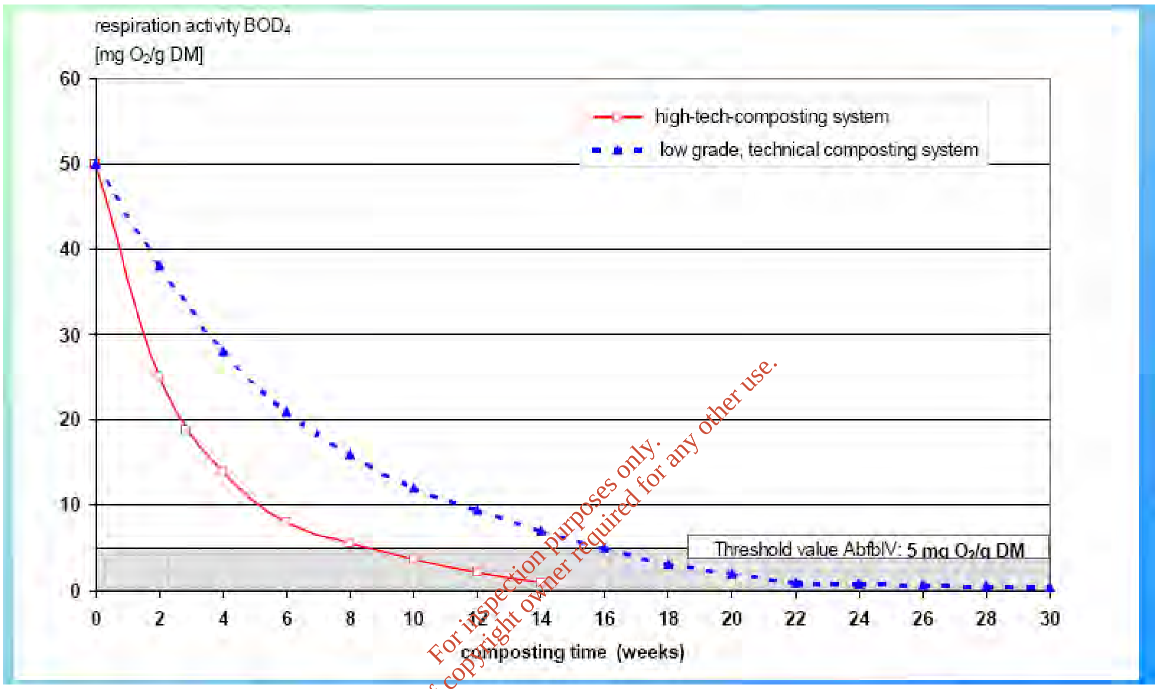


Fig. 20. Reduction in the AT_4 value of mixed waste comparing in-vessel composting and windrow composting techniques.

Hazardous Waste

Proposed Hazardous Waste to be accepted and stored at Clean (Irl) Refuse & Recycling Ltd. (excluding hazardous waste arising from processing of End of Life Vehicles) prior to transfer to waste destination for recovery, process of disposal.

EWC Code 16 06 01 Lead Acid Batteries
EWC Code 16 06 02 Alkaline Batteries

EWC Code 15 02 02* Absorbets, Filter materials Wiping cloths protective clothing contaminated by dangerous substances

EWC Code 1706
Asbestos from construction waste

EWC Code 08 01 11
Waste Paint and Varnish containing organic solvents or other dangerous substances.

EWC Code 08 01 17
Waste from paint or varnish removal containing organic solvents or other dangerous substances.

EWC Code 08 01 21
Waste Paint or Varnish Remover

EWC Code 13 01 13
Other hydraulic Oil

EWC Code 13 05 02
Sludges from oil/water separators

EWC Code 13 05 03
Interceptor sludge

EWC Code 15 02 02
Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances

Explosive Components (air Bags)

EWC Code 17 05 03
Soil Stone containing dangerous substances

EWC Code 17 08 01
Gypsum based construction materials contaminated with dangerous substances

EWC Code 20 01 35
Discarded electrical and Electronic Equipment 20 01 21 20 01 23 20 01 35

Handling and Storage

Description	Handling and Storage
Asbestos	Will be stored on timber pallets to facilitate transportation of-site. Asbestos will be double wrapped in 1000 gauge heavy duty plastic and clearly marked. Will then be forwarded onto KTK Landfill Co. Kildare
Waste Paint and Varnish containing organic solvents or other dangerous substances	Stored in 205 Litre UN Drums within drop down skip processing building Will be forwarded onto Enva Ireland Ltd, Clonminam Industrial Estate, Portlaoise, Co. Laois.
Waste from paint or varnish removal containing organic solvents or other dangerous substances.	Stored in 205 Litre UN Drums within drop down skip processing building Will be forwarded onto Enva Ireland Ltd, Clonminam Industrial Estate, Portlaoise, Co. Laois.
Waste Paint or Varnish Remover	Stored in 205 Litre UN Drums within drop down skip processing building. Will be forwarded onto Enva Ireland Ltd, Clonminam Industrial Estate, Portlaoise, Co. Laois.
Sludges from oil/water separators	Will be forwarded onto Enva Ireland Ltd, Clonminam Industrial Estate, Portlaoise, Co. Laois.
Interceptor sludge	Will be forwarded onto Enva Ireland Ltd, Clonminam Industrial Estate, Portlaoise, Co. Laois.
Soil Stone containing dangerous substances	Stored on an impermeable concrete slab. Will be forwarded onto Enva Ireland Ltd, Clonminam Industrial Estate, Portlaoise, Co. Laois.
Gypsum based construction materials contaminated with dangerous substances	Stored on an impermeable concrete slab. Will be forwarded onto Enva Ireland Ltd, Clonminam Industrial Estate, Portlaoise, Co. Laois.
Discarded electrical and Electronic Equipment	Within waste processing sheds.
Batteries	All stored in leak proof and corrosion proof plastic container pending disposal within drop down skip processing building. Will be forwarded onto Enva Ireland Ltd, Clonminam Industrial Estate, Portlaoise, Co. Laois.
Fluorescent Tubes	Inside in wheeled coffin box. Will then be forwarded onto Irish Lamp Recycling Co. Kildare.
Explosive Components	Stored within covered area for dealing with depollution of ELV's
Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	Stored within covered area for dealing with depollution of ELV's
Other hydraulic Oil	Stored within covered area for dealing with depollution of ELV's

Amendments to EIS submitted to EPA on 22rd December 2008

Notes			
All references to the following drawings in the EIS have been overwritten with a revised version to amend the site drawings for the change in proposed Biostabilisation Plant. Original Drwg no: / Revised Drwg no: / Description C(IRL)WL-01 / C(IRL)WL-01 Rev 1 / Existing site layout & proposed redline C(IRL)WL-02 / C(IRL)WL-02 Rev 1 / Proposed Site Layout (redline only) C(IRL)WL-06 Rev1 / C(IRL)WL-06 Rev 2 / Environmental monitoring locations existing with proposed redline only C(IRL)WL-10 / C(IRL)WL-10 Rev 1 / Emissions to air C(IRL)WL-12 / C(IRL)WL-12 Rev 1 / Services plan C(IRL)WL-19 / C(IRL)WL-19 Rev 1 / Surface Water Drainage Plan C(IRL)WL-23 / C(IRL)WL-23 Rev 1 / Hardstanded area C(IRL)WL-25 / C(IRL)WL-25 Rev 1 / Noise Emissions C(IRL)WL-27 / C(IRL)WL-27 Rev 1 / General Arrangements			
Page No.	Section	Paragraph	Last Title
4	1.2	3	*Scope*
Paragraph/bullets overwritten with the following: The proposed infrastructure development will include: • Biostabilisation Plant (dry fermentation, in vessel composting tunnels, biofilter) • Extension to existing processing buildings • Relocation of glass bunkers • Provision to End of Life Vehicle unit • Relocation of existing diesel tank bunded storage area • Truck wash area • Wheel wash • Combined Heat Power (CHP) Plant • Hardstanding skip storage area			
Page No.	Section	Paragraph	Last Title
4/5	1.2	5	*Scope*
Paragraph/bullets overwritten with the following: The introduction of new waste processes/activities which will include: • Biostabilisation (dry fermentation and in vessel composting tunnels) of source segregated brown waste and organic fines from Municipal Solid Waste (MSW) using mechanical separation technique • Utilisation of Biogas from dry fermentation process in a CHP Engine to providing heat and electricity • End of Life Vehicle processing • Hazardous waste acceptance and storage • Storage of Refuse Derived Fuel (RDF) • Truck wash			

- Wheel wash
- Skip storage

Page No.	Section	Paragraph	Last Title
10	1.4	6	Alternatives Considered

All Section 1.4 to be overwritten with the following:

Considering, the existing facility which is already carrying out several waste processing streams as listed in previously Scope 1.2, alternatives have not been considered as the existing operations are already inline with the waste management plan's objectives. However, in considering the introduction of the brown waste bin an assessment of the alternatives were considered. including landfill.

Landfill disposal is the current practice in most of Ireland and within County Clare for the management of biodegradable waste materials. As described previously, landfill disposal is the least preferable option for managing waste with respect to potential environmental impacts, current EU and Irish legislation and cost. Landfilling of biodegradable materials increases the environmental impacts of landfill disposal by generating methane gas, creating odours, producing nutrient rich leachate and attracting pests. Methane gas is 21 times more potent as a greenhouse gas than carbon dioxide, a much less harmful greenhouse gas that is generated when materials are aerobically treated via composting. When materials are allowed to uncontrollably rot in landfills, they can create offensive odours and leachate, especially in our wet climatic conditions here in Ireland. In older unlined landfills, this leachate becomes a source of water pollution. In newer lined landfills, this leachate is collected for treatment as long as the landfill is lined and actively managed. This collection system and leachate treatment adds to the cost of landfill construction and management while the landfill is open and even after it is closed. Daily tipping of waste into landfill cells attracts insect, bird and rodent pests which can serve as a vector for disease and can become a nuisance to neighbours. Due to the severe negative environmental impacts associated with landfilling biodegradable waste materials, EU and Irish legislation have been developed to minimise the use of landfills for disposal purposes. Therefore, landfill disposal will no longer be a viable or preferred option in the future for unprocessed mixed waste or separated biodegradable waste materials.

Clean Ireland Recycling plays a significant role in the management of MSW in County Clare. In this regard, the company has been active in assessing technologies which effectively facilitate landfill diversion. To date this has concentrated on the retrieval of dry recyclables. More recently, technologies for the biological processing of both source-separated and mixed bio-waste have also been assessed. In this regard Clean (Irl) Refuse & Recycling Ltd. considered that the development of biological treatment infrastructure for both source-separated bio-waste and mixed waste would be necessary in order to achieve the levels of diversion set down in the waste management plan for the region.

Initially, it was considered that in vessel composting was the most appropriate approach for the handling of both source-separated and mixed MSW. In parallel with this assessment, the energy efficiency of the technologies was considered. As a result, with the recent introduction of a feed in tariff for renewable electricity allied to the increase in energy prices, anaerobic digestion was also considered. Initially this was discounted as the economies of scale typically applied to standard anaerobic digestion (AD) systems were beyond the potential tonnages that would be available in Clare. In addition, it was also considered that typical wet fermentation systems were unreliable in the processing of mixed waste. During this period, Clean Ireland received consultation on the issue and actively visited bio-waste plants in Ireland, the UK and Germany. Ultimately it was considered, that no single technology would be suitable to process the full range of bio-waste that Clean Ireland expected to receive at their facility.

In brief, Clean Ireland needed the flexibility to process the following bio-waste inputs:

- Domestic brown bins containing both green waste and food waste
- Domestic brown bins containing food waste only
- Mechanically separated organics from MSW
- Post-consumer catering waste
- Former foodstuffs
- Grease trap
- Bio-solids
- Wood waste
- Green waste

All these materials have differing ABPR restrictions and material handling requirements. Therefore, it was identified that the facility would need to meet the following criteria.

- Ability to receive and process both liquid and solid inputs
- Ability to process both source-separated and mixed waste fines
- Maximum energy retrieval from material where possible
- Generation of a marketable compost and or digestate product from the source-separated bio-waste input material
- Generation of a landfill directive compliant bio-stabilised output from the mixed waste material
- ABPR compliance
- EPA license compliance
- Full enclosure to manage emissions
- Cost effectiveness

Ultimately, it was determined that a combination of dry fermentation and tunnel composting technologies would be required to meet these specifications that would allow the facility maximum flexibility in relation to the bio-waste that it intended to manage. As a result maximum control of emissions is provided for with little or no leachate being generated as all process liquors are contained. In addition, effective odour abatement is provided by the initial sealed fermenter based anaerobic processing of all raw bio wastes allied to the tunnel based post composting of the solid-state digestate. In addition, all ventilation air within the processing hall is captured and subjected to biofiltration.

The Biostabilisation Plant which has been proposed to convert "brown bin" materials (food and garden trimmings) into valuable soil amendment products is not without energy needs. Currently, the facility runs a 650kW diesel generator to provide electrical power to the site. The proposed alternative to this operation is the installation of a gas storage unit and CHP engine to produce all of the electricity and heat needed to operate the expanded Clean Ireland facility and the opportunity to export to the nation electricity grid. The gasification system takes super clean and dry wood that the site is currently producing and coverts it into a Hydrogen rich "syngas" that fuels an engine/generator. It simply substitutes a carbon neutral renewable energy system for the non-renewable diesel one currently being used on site.

Given the types and relatively small quantities of materials to be processed by Clean (Irl) Refuse & Recycling Ltd. , building and operating an aerobic Biostabilisation Plant makes the most economic sense and produces a high-quality marketable product while complying with EU, Irish and regional waste management legislation, policies and goals

Page No.	Section	Paragraph		
13	1.5	1		

Consulting Team Composting Consultancy	Celtic Composting Systems Ltd Registered (No. 350269) Gearagh Road, Ballinacurra, Midleton, Co. Cork, Ireland (Dr. Andrew Walsh)

Page No.	Section	Paragraph	Last Title
16	2.1.1	2	*Development Proposal-Overview*

Paragraph/bullets overwritten with the following:
The proposed infrastructure development will include:

- Biostabilisation Plant (dry fermentation and in vessel composting tunnels)
- Biofilter and Fabric Roof
- CHP Plant
- Extension to existing processing buildings
- Relocation of glass bunkers
- Provision to End of Life Vehicle unit
- Relocation of existing diesel tank bunded storage area
- Truck wash area
- Wheel wash
- Hardstanding skip storage area

Page No.	Section	Paragraph	Last Title
17	2.1.1	1	*Development Proposal-Overview*

Paragraph/bullet overwritten with the following:
The introduction of new waste processes/activities which will include:

- Biostabilisation (dry fermentation and in vessel composting tunnels) of source segregated brown waste and organic fines from MSW using mechanical separation technique
- Utilisation of Biogas from dry fermentation process in a CHP Engine to providing heat and electricity
- End of Life Vehicle processing
- Hazardous waste acceptance and storage
- Storage of RDF
- Truck wash

- Wheel wash
- Skip storage

Page No.	Section	Paragraph	Last Title
23	2.2.2.3	2	***Wheelie Bin/Truck/Wheel Washing***

Section 2.2.2.3 overwritten with the following:

Clean (Irl) Refuse & Recycling Ltd. refuse and container trucks are washed as required in a designated area adjacent to the Fuel Storage Bund at the front of the site. A power hose is used to wash mud and dust off the vehicles. The washings drain into a concrete trap to retain any larger items (e.g. caught in wheels). This water drains into the surface water and is discharged to the north drain via a silt/oil interceptor. Wheelie bins washing currently takes place at a hardstanded designated area located at the eastern perimeter of the facility; washings are directed into the eastern surface water drain running parallel to the east perimeter in a northerly direction. There is currently no wheel wash facility at the site however, the proposed development will include a designated truck wash with a leachate collection tank at the north of the site, all wheelie bin washing will take place at an alternative facility off site.

Page No.	Section	Paragraph	Last Title
33	2.3.1	4	*Site Overview*

Paragraph overwritten with the following:
The most significant development of the site will be localised to the most southerly section of the site where it is proposed to build a biostabiliation plant/biofilter, and also a CHP plant for the generation of electricity and heat for the site with potential to feed into the national grid. Extensions to the existing processing buildings, relocation of the glass bunkers, installation of diesel storage bunded unit, and the creation of End of Life Vehicle unit will be secondary in terms of the scale of the development. The proposed hours of operation are detailed overleaf:

Page No.	Section	Paragraph	Last Title
34	2.3.1	1	*Site Overview*

Paragraph overwritten with the following:

Proposed hours of operation:

7a.m. to 12a.m. Monday to Saturday
8 a.m. to 6p.m. Sunday

Proposed hours of waste acceptance/handling:

8a.m. to 8a.m. Monday to Saturday
8a.m. to 6p.m. Sunday

Proposed hours of any construction and development works at the facility and timeframes:

9a.m. to 6p.m. Monday to Friday
9a.m. to 1p.m. Saturday

Page No.	Section	Paragraph	Last Title
34/35	2.3.2	2/3	*Development Proposal*

Paragraph/bullets overwritten with the following:

The proposed project, which will upgrade existing activities at the site, is being developed by Clean (Irl) Refuse & Recycling Ltd. and will include the following: The proposed infrastructure development will include:

- Biostabilisation Plant (dry fermentation and in vessel composting tunnels)
- Biofilter and Fabric Roof
- CHP Plant
- Extension to existing processing buildings
- Relocation of glass bunkers
- Provision to End of Life Vehicle unit
- Relocation of existing diesel tank bunded storage area
- Truck wash area
- Wheel wash
- Hardstanding skip storage area

The introduction of new waste processes/activities which will include:

- Biostabilisation (dry fermentation and in vessel composting tunnels) of source segregated brown waste and organic fines from MSW using mechanical separation technique
- Utilisation of Biogas from dry fermentation process in a CHP Engine to providing heat and electricity
- End of Life Vehicle processing
- Hazardous waste acceptance and storage
- Storage of RDF
- Truck wash
- Wheel wash
- Skip storage
-

Also, End of Life Vehicles on line 10, page 35 to be overwritten with 'hazardous; which will mainly include hazardous components from the depollution of End of Life Vehicles, waste paints/inks, asbestos, WEEE etc'. In figure 2.4 on this page, End of Life Vehicles in the pie chart to be overwritten with hazardous.

Page No.	Section	Paragraph	Last Title
36	2.3.2.1.1	1	*Construction and Design*

In figure 2.5 on this page, End of Life Vehicles in the pie chart to be overwritten with hazardous.
All of Section 2.3.2.1.1 overwritten with the following:

Clean (Ireland) Refuse and Recycling Ltd. is proposing to build and operate a state-of-the-art, totally enclosed facility to convert up to 15,000 tonnes (when blended with bulking materials, mainly shredded timber) per year of biodegradable materials found in the residential and commercial waste streams into fully stable and marketable soil amendment products. The proposed tonnes for brown bin waste intake to the facility will be 13,500 tonnes. This facility will utilise proven, best available control technologies and best management practices for processing biodegradable waste materials, such as landscape materials, food, wood and non-recyclable paper, into valuable soil enhancing products while minimising any potential impacts to the environment or nuisances to neighbours. This proposed bio-stabilisation plant will be built in one phase and involves footprints of c.5,182m^2 for the Biostabilisation Plant (including MSW mechanical sorting area) and 496m^2 for the associated biofilter.

The Internal Layout Drawing C(IRL)WL-27 Rev-1 are included in Attachment 3. The plant design is segregated into following waste processing areas:

- Enclosed mixed waste reception area
- Enclosed MSW mechanical separation plant
- Enclosed source separated reception area
- 6 no. Fermentation Chambers (30m x 7m x 5m)
- 3 no. Aerobic Composting Tunnels (30m x 7m x 5m) with single doors
- 1 no. Pasteurisation Tunnels (30m x 7m x 5m) with double doors

Ancillary components required for the operation of the Biostabilisation Plant include:

- 1. no. Percolate Storage Tanks
- 2. no Leachate Storage Tanks
- Compost screen
- 1no. Biofilter
- 1no. CHP Engine and enclosure

Storage of final compost will occur in an external compost area as indicated on drawing Internal Layout C(IRL)WL-27 Rev-1.

The Biostabilisation Plant is split into two distinct areas. Along the most westerly section of the building, a mechanical sorting and screening plant for biowaste (MSW) will be segregated from the main building to mitigate cross contamination of MBT fines and source segregated organic waste.

The remaining plant layout will be in the form of main waste reception area and 6 no. fermentation chambers, 3 no. in vessel composting tunnels and 1 no. pasteurisation tunnels. There will be a gallery positioned over the concrete tunnels where the blowers and ancillary equipment will be located. A gas storage unit is also located in this area to supply Biogas to the CHP engine adjacent. Finally, a facility office and control room is located in the gallery to monitor and control the operation of the plant.

The building fabric of the plant will mainly comprise of concrete with cladding to the eaves. The highest apex is 10.7m high with a split roof falling to the eaves. Concrete push walls are required internally which will be constructed 2-3 metres high for handling of waste piles with plant machinery. Ventilation of the main building void is under negative pressure with 1-4 air changes per hour.

Page No.	Section	Paragraph	*Last Title*
38	2.3.2.1.2	2	*Air Extraction*

All of Section 2.3.2.1.2 overwritten with the following:

Air Extraction

While the building is designed to be operated under slight negative pressure (1-4 air changes per hour), the air handling design for the building has been developed to minimize the volume of air to be handled and consequently the biofilter size:

- The management of all raw bio-waste through the dry fermentation process results in all emissions from this process to be directed to the CHP. The resultant thermal oxidation of the anaerobic exhaust will give greater than 99% reduction in odour from the bio-waste while being maintained under anaerobic conditions.
- The uncontaminated air space above the tunnels and fermenters is isolated from the main building to avoid the requirement to biofilter this void space. This is ventilated directly to atmosphere with no consequential odour risk.
- The interior of the building is coated with a polyurethane coat for corrosion protection and also to seal the building so that a low to moderate air exchange rate can be facilitated without risk of fugitive emissions.
- As all of the composting process occurs within sealed biocells and tunnels with a low head space, air re-circulation is applied to minimize exhaust generation and thus reduce the biofilter load.

As a result, the ventilation of the main building void is designed for 1-4 air changes per hour. This will allow for rapid clearance of any fog from the building during material movement between biocells/tunnels and screening while minimizing fugitive emissions from the building. This air is mixed with hot and humid exhaust from the aerobic tunnels passed through the biofilter to reduce the odour output from the facility down to levels in compliance with the EPA license and to ensure that sensitive receptors are not impacted by the facility's operation.

Page No.	Section	Paragrapl	Last Title
39	2.3.2.1.3	2	*Odour Control*

All of Section 2.3.2.1.3 overwritten with the following:

Odour Control

The odour abatement system consists of the compost aeration system described previously, the building ventilation system including ventilation piping installed in the roof space of the reception/process building, ventilation blowers, enclosed biofilter and discharge stack. The ventilation pipe work is located in the roof spaces and operates under vacuum. The piping and blowers are sized to ensure that between 1 and 4 air changes per hour can be applied to the building void. The exhaust from the building void will initially be passed through the mixing chamber where the air stream will be mixed with the humid exhaust from the tunnels. This mixture will combine to create a humid exhaust with a moderate temperature that will be suitable for biofiltration. The subsequent exhaust will be passed through a biofilter bed that is composed of graded wood chip (Fig. 19). This media has been found to provide good odour removal efficiencies. The biofilter has been designed to allow an empty bed retention time (EBRT) of between 45 and 90 seconds.

Figure 1: Typical enclosed Biofilter with Stack

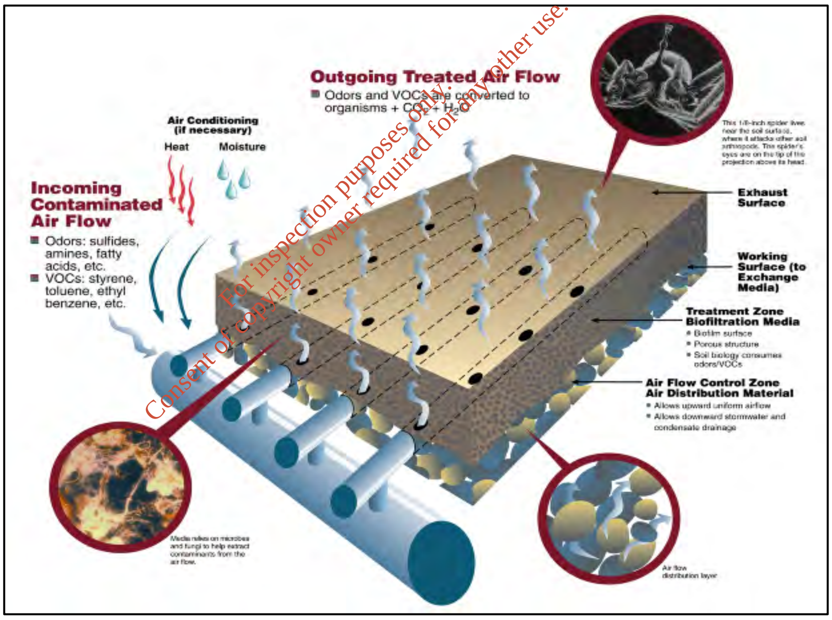


Fig. 2. Schematic of Biofilter Operation.

In the event of desiccation of the media, the biofilter can operate in bio-trickling mode. In this mode, the organic media is kept permanently moist through the use of sprinklers. The exhaust from the biofilter is then discharged through a stack to the atmosphere.

The full enclosure of the facility with a single discharge point allows for maximum control of the odour output from the facility. The combination of enclosure, optimised compost aeration, effective air stream capture and treatment will result in odour emissions from the facility that will not result in nuisance in the vicinity of the facility. One of the primary design criteria for the facility is its odour impact and the above five elements are being developed in parallel with an odour model that will ensure that the odour emission limits set in the EPA license (Table 1) are not exceeded. 1. Below shows limits Values for Biofilters (EPA License).

Parameter	Emission Limit Value
Ammonia	50 ppm (v/v)
Hydrogen sulphide	5 ppm (v/v)
Mercaptans	5 ppm (v/v)

Page No	Section	Paragraph	Last Title
41	2.3.2.2.	2	Biostabilisation Plant Operation

All of Section 2.3.2.1 and 2.3..2.2 overwritten with the following:

he facility is designed to treat both source separated and mixed waste feed stocks. As such, the incoming feedstock will be either directed to the biological building in the case of source separated material or to the mechanical pre-processing building in the case of MSW. Referring to Figure 3 and Figure 4 the following paragraphs will explain the process and waste flow. A more detailed explanation of each step within the process is given in the subsequent sections on dry AD and composting.

The brief mass balance for the MSW and bio-waste inputs to the facility is illustrated in Figures 2.

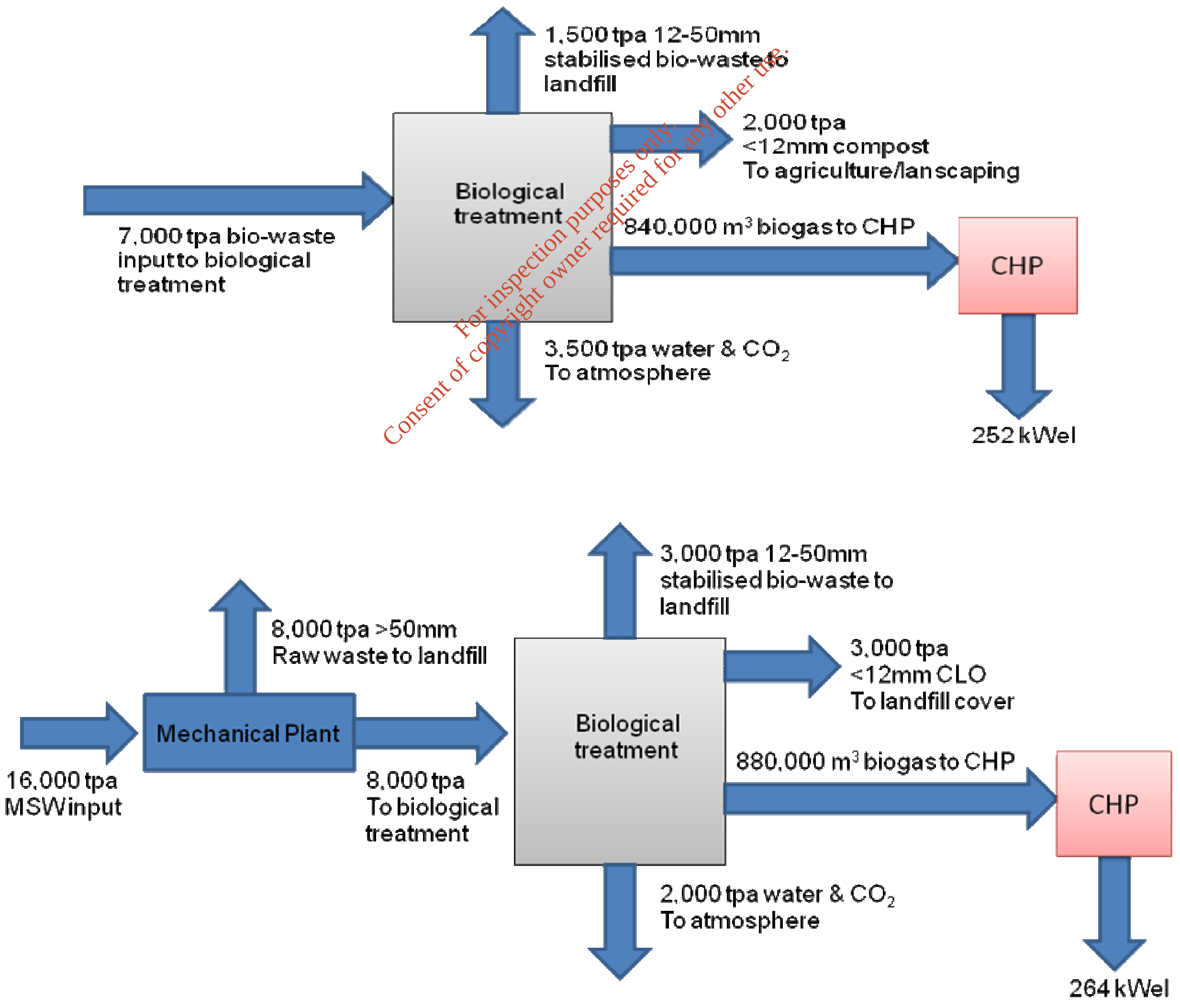


Fig. 3. Mass balance for the MSW inputs to the Clean Ireland facility.

1.1 Waste Reception and Pre-Treatment

The reception and pre-treatment of the bio-waste will occur within the waste reception building. The reception and pre-treatment method employed will vary depending on the incoming feedstock.

1.1.1 MBT Fines

The MBT fines consist of organic rich material that is mechanically extracted from mixed waste delivered to the facility. The mixed waste is shredded and screened at 50mm within the MRF section of the facility and the fines (Fig. 3) are conveyed to the biological building by conveyor. These fines are destined for the dry AD processing stream and will be delivered to the facility in a form that will not require any further pre-processing. The MBT fines will be stockpiled in a dedicated section of the reception building until such time as the volume of feedstock is sufficient to half fill a fermentation chamber (225-325 m^3).

Fig. 4. MBT fines currently being produced at the Clean Ireland MRF.

1.1.2 Domestic Co-mingled Food & Green Bio-Waste

The combined domestic food and green bio-waste feedstock will be delivered to the biological facility by refuse lorry in a form directly suitable for dry AD. Consequently, this material is directly tipped onto the reception building floor and then contained within a dedicated reception area (Fig. 4). As was the case with the MBT fines, this material will be stockpiled in the reception area until such time as there is an adequate supply to make a 50-50 mixture with the partially fermented contents of a recently unloaded fermentation chamber.

Fig. 5. Bio-waste being tipped at the Broadpath in-vessel composting facility in Devon (left) and material being held prior to processing (right).

1.2 Dry Anaerobic Digestion System

1.6.1. Introduction

Dry digestion is well suited to dealing with stackable bio-waste with lower moisture levels, i.e. >20% total solids (TS). These stackable materials can also have high levels of physical contamination and as a result dry anaerobic digestion is ideally suited to the processing of co-mingled brown bin material and MSW fines. In this system the incoming feedstock is loaded into "garage" like gas tight biocells using a loading shovel with little or no pre-processing required. These biocells are referred to as fermentation chambers. A summary schematic of the dry fermentation process is illustrated in Fig. 5. In brief, bio-waste or MBT fines are loaded into a sealed, gas tight concrete vessel and the anaerobic digestion (AD) process is initiated through the spraying of activated anaerobic percolate onto the biomass. This percolate is kept in circulation through an external percolate storage system. The biomass is heated to 37-40°C and biogas production is facilitated. This biogas is drawn off the tunnels and stored prior to use as fuel in a CHP gas engine.

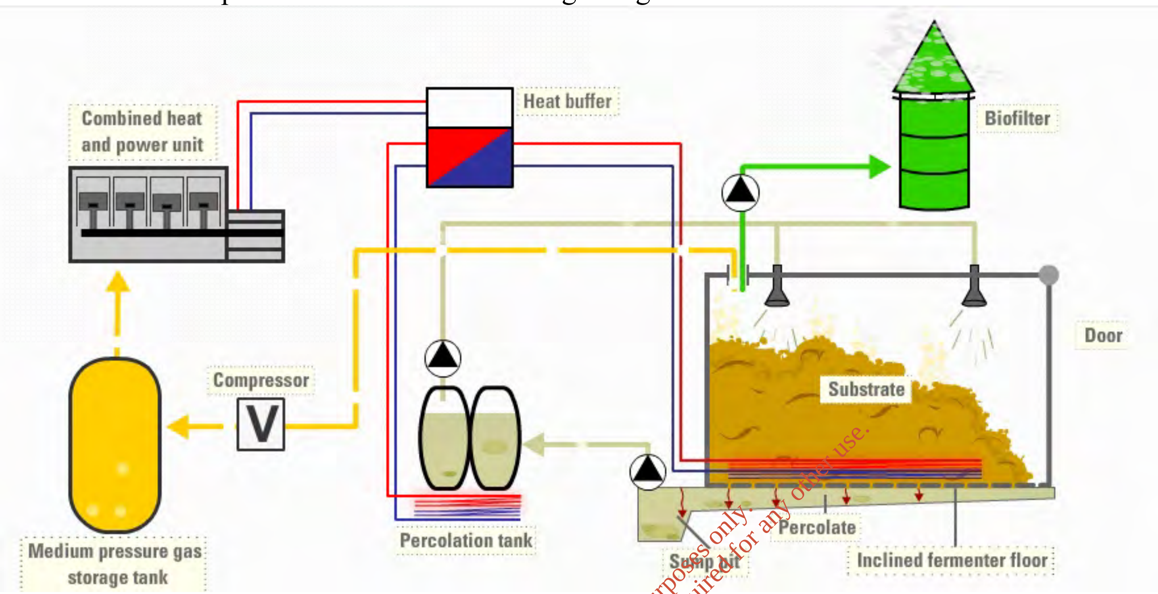


Fig. 6. Schematic of the BIOFERM dry fermentation process.

The system is modular with increasing tonnages of material being managed by additional fermenters. The fermenters are typically 30m long, 7m wide with an internal stacking height of 3.5m. Each fermenter can typically process 2,500 tonnes of bio-waste per year. Due to the cyclical nature of the biogas production process, the minimum number of fermenters is three. This ensures that there is always biogas available to feed the CHP (Fig. 6).

The process of dry fermentation is based on the following procedural steps:

1. Supply and storage of biomass
2. Fermentation
3. Extraction of digestate
4. Ventilation system
5. Gas utilisation

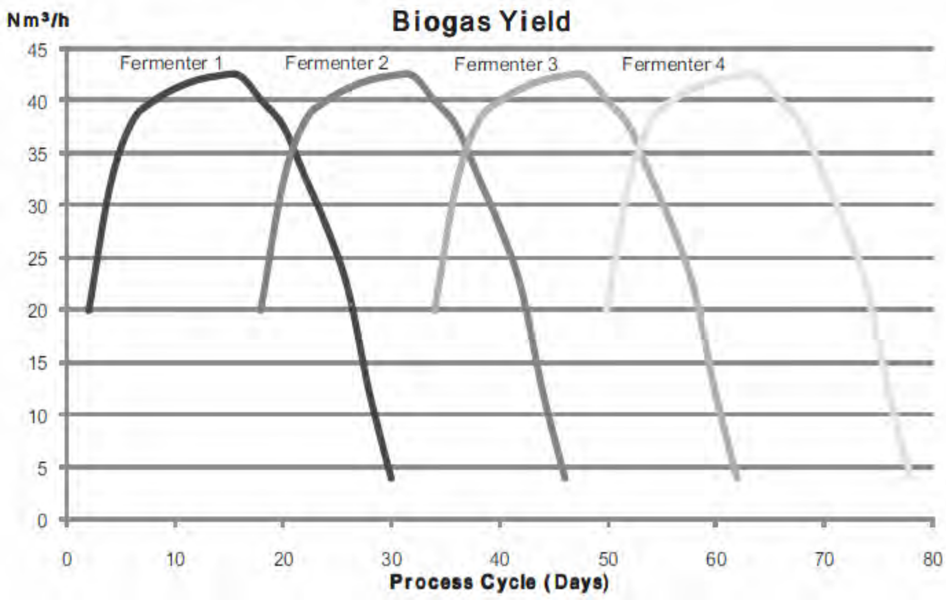


Fig. 7. Typical biogas production cycle from a four fermenter facility.

1.6.2. Supply and Storage of Biomass

When the plant is operational the supply of biomass to the fermentation chamber is based on a 28 day cycle. When a chamber is ready for fresh biomass the first step of the exchange requires the extraction of the partially fermented biomass within the chamber. One portion of the extracted biomass is kept on the building floor and then mixed in an approximate ratio with fresh biomass using a front loader. This ratio will be dictated by the tonnage of material being delivered to the facility and may fluctuate to accommodate seasonal peaks but is expected to be a 50-50 split. The loading and unloading of the solid state digestate is conducted using air-conditioned loading shovels (Fig. 7).

Fig.8. Filling of a fermentation chamber with Bio-waste.

1.6.3. The Fermentation Chambers

Each of the individual fermentation chamber units has an inner floor area of 7m x 30m with an internal height of 5m (Fig. 8). The height of the stacked biomass however, must not exceed 4.0 meters and this is typically managed at 3.5m. The reinforced concrete fermentation chamber is gas tight to prevent the infiltration of oxygen (the presence of which would cause the methane producing bacteria to become inactive). This also prevents the leakage of biogas to the atmosphere. An in-floor heating system holds the biomass at a constant temperature range of between 37-40°C. The plant engineering components are located in a dedicated technology section housed above the fermenters. The capture and storage of biogas is managed through a stainless steel piped biogas ventilation system while short to medium term gas storage bags are also located above the fermentation chambers. The percolate from the fermenters is stored in two insulated and heated tanks.

Fig. 9. Interior of fermenter prior to filling (left) and with bio-waste prior to fermenter sealing.

To insure that the fermentation chamber is not opened before the methane gas is completely drawn from the chamber and safe atmospheric levels of O_2, CO_2 and H_2S are reached, the air inside the chamber is continuously measured and analysed. The values are communicated to the computerized security system controlling the chamber doors. With the exception of loading and unloading biomass from the fermentation chambers the entire plant is fully automated by PLC. Interruptions are immediately recognised and documented.

1.6.4. The Percolate Cycle

The dry fermentation process is facilitated by the "percolate cycle". This involves the spraying of the biomass with an activated anaerobic sludge that is developed in a separate heated tank. This percolate inoculates the biomass while keeping it moist (>70% moisture; <30% solids). While the process of hydrolysis is initiated during storage of the fresh biomass within the reception building, both acidogenisis and methanogenesis steps occur simultaneously within the fermenter. The bathing of the biomass in this activated percolate is key to the process.
In order to drain off excess percolate, a series of stainless steel gutters of 1 m length each with grating are built into the fermentation chamber floor. They absorb excess liquid from percolate sprinkling and route it in a controlled way to a gas tight pipe collection system. From the collection pipes the percolate is routed to the insulated covered transfer pump duct (10 m^3) utilising the following equipment:

- Fill level sensor to switch the lift pump
- Transfer pump (mix pump) with pressure pipe to the percolate storage unit
- Ventilated air pipe
- Temperature sensors
- Access door
- Limit Switch

From the transfer pump duct, which is already equipped with a 3-layer coating and a leakage detection system, the fermentation liquid is pressure pumped into an insulated percolate storage unit (Fig. 9). The entire piping system is routed in a frost-proof zone outside the fermentation chamber area. The percolate storage unit consists of the following parts:

- Inlet pipe end
- Filling level sensor to switch the pump

- Transfer pump (mix pump) with pipes to the chamber sprinkling system
- Water tank for excess pressure safety
- Heating (Wall heating)
- Temperature sensor
- Pressure sensor
- Access door
- Limit switch
- Fermentation chamber connection unit

This percolate storage unit is installed with capacity to hold enough percolate for the entire fermentation process (even in the case of dry or highly structured material) where excess water may need to be added. The percolate storage unit is heated via a heat exchanger attached to the CHP unit. A temperature meter is located in the storage unit and takes real time percolate temperature measurements. By doing this, the heat circulation pump can be controlled and when necessary turned on/off.

The percolate is pumped to the individual fermentation chambers via HDPE pressure pipes. The percolate pipes route to the sprinkling unit of the fermentation chambers through gas tight ceiling ducts. A time sensitive control system determines the maximum percolate sprinkling requirement of the biomass. The cycle comes to an end when the percolate has seeped through the biomass. The remaining bacterial fluid is collected, siphoned and then transported using the transfer pump duct. This is to ensure that the percolate cannot leave the system in an uncontrolled manner. Should the gauge in the percolator storage unit fall below the minimum level required for fermentation of exceptionally dry biomass, fresh water can be applied to the biomass. As a general rule the percolate level should be balanced as the percolate is recycled and stored in the final storage chamber.

Fig. 10. Percolate storage at a Bioferm facility in Japan

1.6.5. Heating

Less than 5% of the heat generated from the CHP engine is utilised to maintain the working temperature within the fermenters; the rest can be used for external purposes. The thermal energy from the CHP engine is passed to a heat-exchanging device whose operating temperature averages around 85°C. By means of heat pumps, warm water is channeled though the heating system of the biogas plant. The fermentation system is conducted at mesophilic temperatures of around 37-40° C. Heat is transported through stainless steel pipes. The fermentation chamber floor is equipped with heat piping so that the temperature of the fermenting material is maintained at 37-40° C. The placement of the heat distributor alongside the heat in-feed of the percolate storage units ensures against excess heat exchanges.

1.6.6. Pneumatic Controls

The compressor produces the required compressed air to activate all pneumatic valves and it is regulated with an on/off switch. The air pressure lines are routed to a distribution manifold to facilitate individual valve requirements. In the case of pressure loss or a controlled emergency stop, all pneumatic valves are depressurised automatically through a closing mechanism, using the spring-break principle, thus securing the plant in a safe operating state and preventing uncontrolled gas leaks. Pneumatic valves are activated by the air pressure from the respective chambers: The chamber door is manually opened and closed. When the door is closed, it is pneumatically locked. Compression couplings generate the necessary surface pressure and use it to assure the chamber remains gas tight. In order to open the fermentation chamber door, clamping screws require loosening and a pneumatic release device needs to be operated by hand. Only when gas quantities of ≤ 3 % CH_4, < 0.5 % CO_2 and > 18 % O_2 are measured in the fermentation chamber is approval to open the door given via the PLC system (green indicator on control panel). The pneumatic lock on the chamber door can then only be opened with a key. There is a finite time limit within which the chamber door must be opened. If the door is not opened during the allowed time a new approval sequence must be given by the PLC control system based on the content of methane and oxygen in the fermentation chamber.

1.6.7. Gas Measurement and Storage

After loading the fermentation chambers, the biomass is kept undisturbed for a period of approximately four weeks, during which time the biomass is anaerobically fermented and biogas is produced. The gas quality (CH_4, CO_2, H_2S and O_2) is determined with a gas analysis device and communicated to the PLC system and the Siemens SCADA software interface (Figs. 10 & 11). The plant operating parameters such as temperature, pressure, gas quantity and quality are stored in a database. Percolate quantity, valve and plant conditions (fermentation chamber, gas storage, CHP) are monitored via the PLC.

The biogas is extracted from the chamber with an explosion and leak proof ventilation mechanism and it is routed into the gas storage unit located on top of the fermentation chambers (Fig. 12). The internal pressure of the gas storage unit under normal operating conditions is maintained at a maximum of 5 mbar. For safety reasons the internal pressure of the gas storage unit must never exceed 25 mbar. This is controlled by the PLC with a further mechanical pressure relief valve that routes the excess biogas to a flare. The gas storage bag is designed with enough capacity to buffer the biogas even during offline maintenance works on the degasification units of the plant or the CHP unit. When the degasification unit or the CHP unit comes back online the buffered gas can be reprocessed. Under normal operation the gas storage units are loaded to a maximal of 30 - 40 % of capacity via the level control sensor to guarantee enough buffer capacity for operational disturbances.

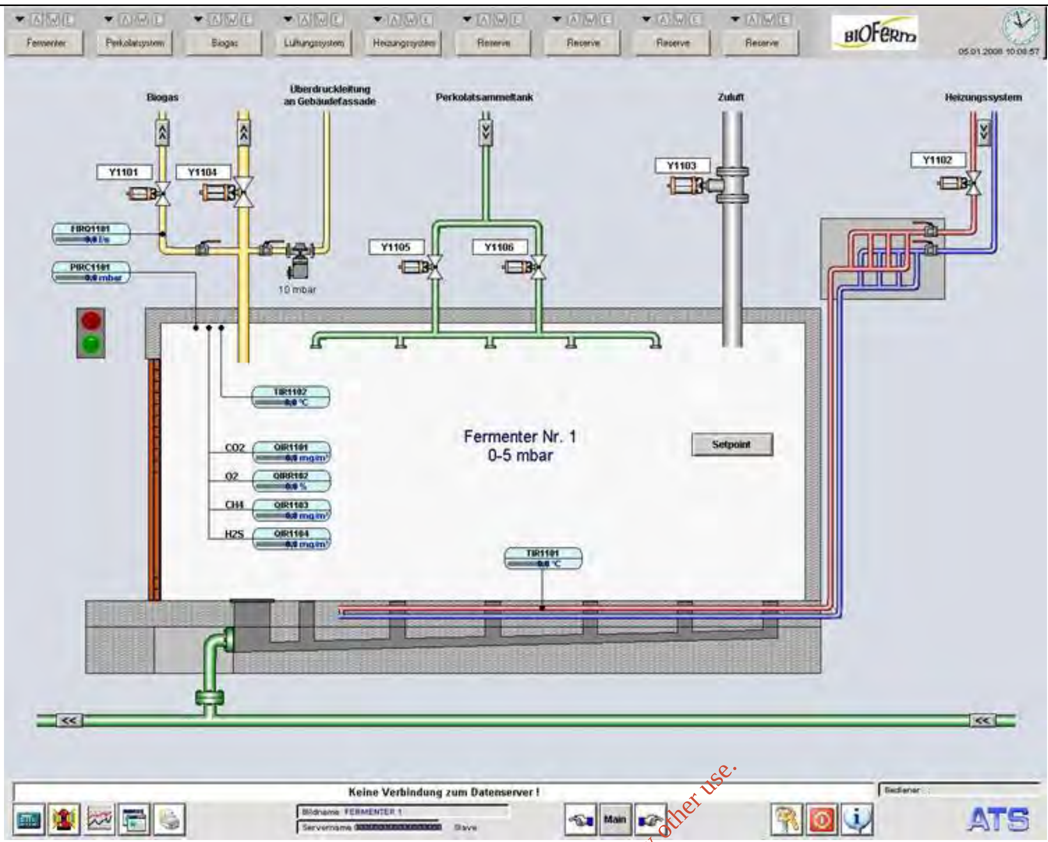


Fig. 11. Siemens SCADA control of fermenter. No.1 at the Moosdorf facility in Bavaria.

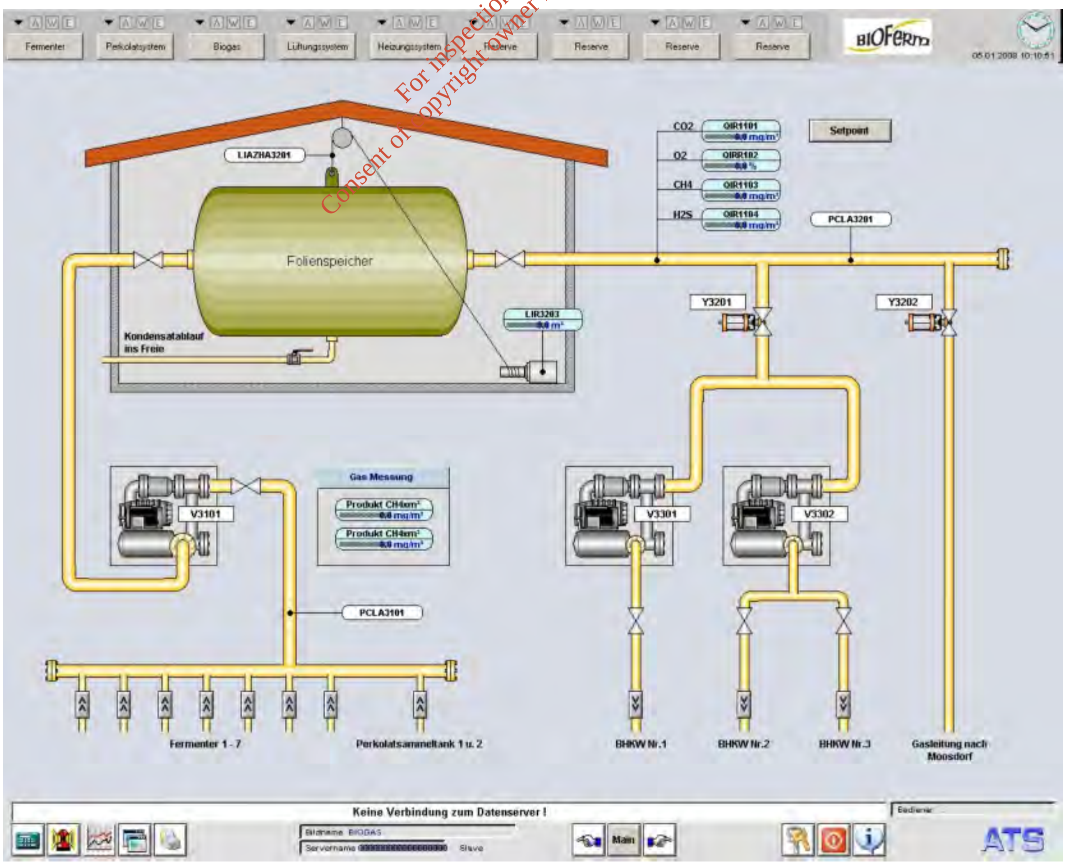


Fig. 12. Siemens SCADA control of gas storage at the Moosdorf facility in Bavaria.

By mixing the streams of gas from different fermentation chambers a gas with consistent methane content is produced. Due to this process the methane content of the mixed gas will be the average of the combined fermentation chambers thus achieving higher process stability. A minimum mixed gas methane content of 57% is aspired to. The desulphurisation of the gas is achieved automatically by the PLC control system. A hydrogen sulfide level of less than ≤ 100 ppm is desired. The moist biogas stays in the gas storage unit for a period of time while cooling to ambient temperature. During this process the water in the gas condenses and is transferred via a siphon water duct (150 mm) from the deepest point of the gas storage unit to the fermentation chamber below. This is process is referred to as passive condensation extraction. Further biogas production takes place in the percolate storage tank. A connection to a fermentation chamber is installed on the ceiling of the percolate storage tank and the biogas is exhausted via a gas compressor. The gas is condensed and routed to the gas storage unit.

Continuous measurement of CH_4, CO_2, H_2S and O_2 levels and gas volume for each individual fermentation chamber as well as the volume and composition of the mixed gas in the gas storage unit is carried out to monitor the line operation. This is essential for optimal control of all processes and any interruptions can be detected and prevented at an early stage.

Fig. 13. The pneumatic gas collection system on the roof of the fermenters (left) and the gas transfer blower to the gas bag located in the roof space above the fermenters (right).

A fermentation chamber gas extraction unit consisting of the following components is attached to each fermentation chamber on a gas tight ceiling conduit:

- Valve to the CHP
- Valve for the gas collection pipes with gas meter.
- Hydraulic safety valve for vacuum and pressure gauge

1.6.8. Fermenter Ventilation System

The ventilation system provides sufficient ventilation for the fermenter chamber opening process. Ventilation is accomplished with a controlled piping system (stainless steel, resistant to methane gas and electrical conductivity), backpressure valves and ventilation units. The exhaust air within the fermentation chamber is combined with compost exhaust and the building air which is ultimately discharged to the atmosphere via a bio-filter.

See page 23 of this document for description of the CHP engine.

1.7. In-Vessel Composting System

1.8.1 The Compost Tunnels

Three aerobic tunnels are provided (30m x 7m x 5m) to post process the dry AD fermenter output for both the MBT and source separated outputs from dry fermentation. The tunnels are constructed from re-enforced concrete designed to withstand strong chemical attack and high abrasion (Fig. 14). They are sealed by insulated stainless steel lined sliding doors. The tunnels are equipped with a proprietary "C:N" aerated floor system with a computer controlled blower system that is mounted in a gallery on the roof of the tunnels overlooking the tunnel loading area. Approximately 50% of the output from the fermenters is transferred to the aerobic composting tunnels on each cycle and the material is mixed with screen overs to inoculate the material with aerobes.

This material is then stacked within the composting tunnels and aerated. The material readily de-waters and the aerobic microbial population rapidly increases. This is reflected by the auto-thermic increase in temperature of the biomass into the thermophilic range.

Fig. 15. Exterior of the composting biocells illustrating the sliding doors (left) and the proprietary C:N in-pavement aeration system (right).

1.7.2. Control of the Composting Process

The composting process for the tunnels is controlled by a PLC / PC interface, which dictates the airflow within the biomass. The flow of air responds to temperature, pressure and oxygen changes in the composting mass that are continuously recorded by the PLC.

At the beginning of the process, when the composting mass is heating up, the computer system is in "oxygenation" mode. Here the process control system is programmed to blow air into the vessels on a periodic basis to maintain adequate oxygen levels and stimulate the growth of aerobic bacteria. A diagram of the aeration system is illustrated below. The blower system is illustrated in Fig. 16.

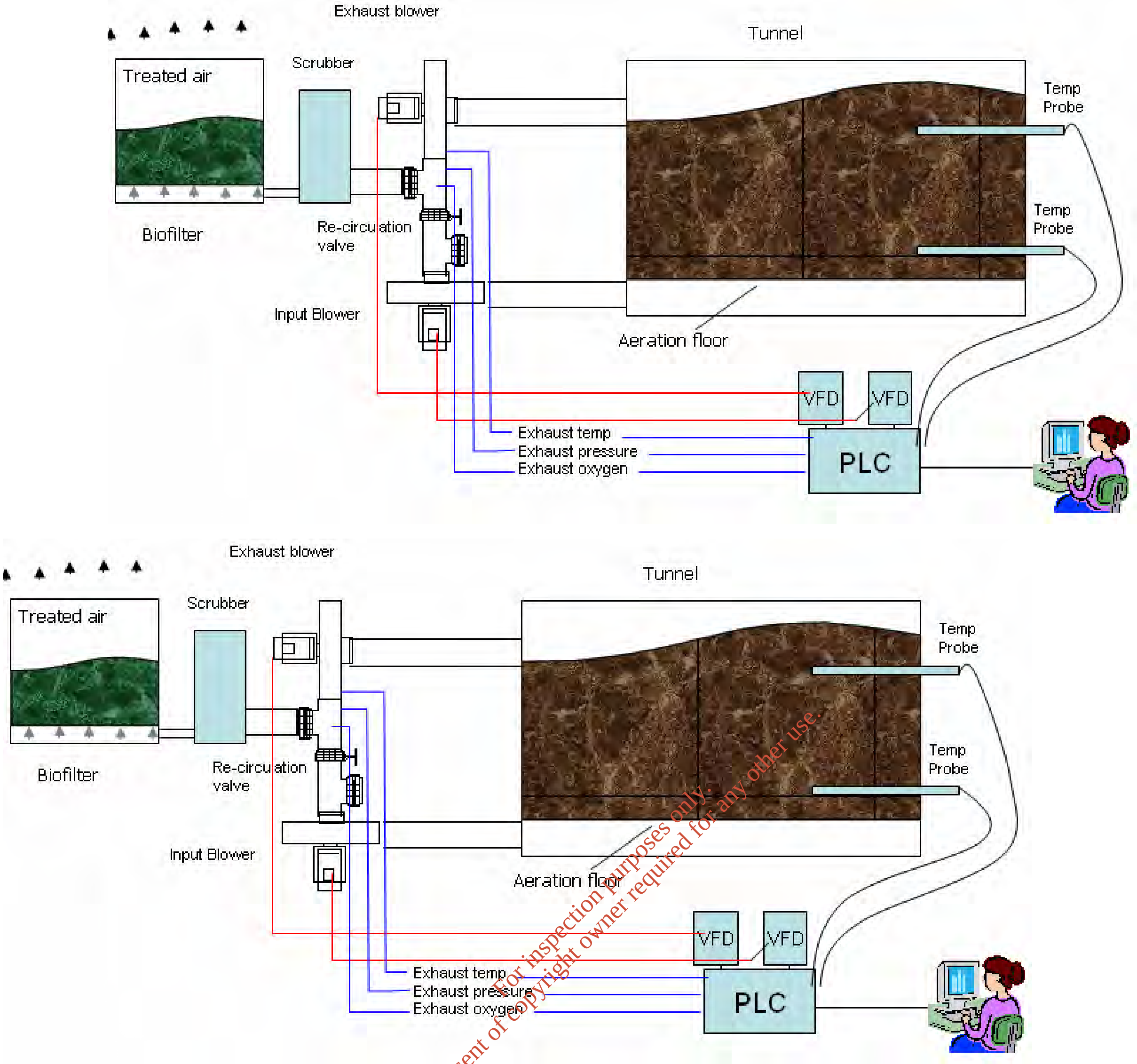


Fig. 16. Schematic of the CCS PLC controlled biocell aeration system.

The PLC coupled with a windows based PC computer allows the operator to configure a temperature profile for the 14-28 days of post fermentation composting and bio-drying. This allows the temperature within the biomass to be controlled within set limits while excess moisture is driven off. Typically the compost would be turned within 7-10 days to break up compaction during this aerobic stage. At the end of this period, a compost at Rottgrade IV will be produced with a moisture content of 35-40% that is then retrieved from the composting tunnels for screening.

Fig. 17. The blower modules in the gallery of the Deepmoor tunnel composting facility in Devon.

1.7.3. Compost Screening

The screening plant is housed within the building to ensure that there are no fugitive emissions of odorous air during the screening operation (Fig. 17). In order to achieve ABPR compliance, both MBT and source separated materials will be screened at 12mm. The overs from the MBT line will be landfilled as stabilised bio-waste, while a proportion of the source separated overs will be used to inoculate the digestate prior to tunnel composting. The unders from the 12mm screen will be segregated for pasteurisation.

Fig. 18. Housed trommel screen illustrating multiple sections that produce different grades of compost and overs.

1.7.4. Compost Pasteurisation and Storage

The trommel screen will produce a fine grain 12mm compost fraction from both MBT and source separated lines. This material will be loaded into a dedicated pasteurisation tunnel that is aerated under maximum re-circulation. Recently screened compost will generate a short period of increased microbial activity due to the physical abrasion resulting from screening. As a result, this compost will reach high temperatures (60-80°C) in the following days if oxygen is supplied. This is facilitated within the controlled tunnel environment and while temperatures in excess of 70°C can be expected in the following 48 hours, additional heat can be introduced from the CHP heat exchanger that is connected to the input blower as a fail safe feature.

After the pasteurisation set points have been achieved, the blowers automatically revert to heat exchange mode to bring the temperature down and thus facilitate further mesophillic maturation during the remaining 4-7 days. This also ensures that when the compost is retrieved from the back door of the pasteurisation tunnels odour is all but eliminated.

An area at the back of the facility has been designated for compost storage prior to release off site. The area will allow for approximately 2-3 weeks of compost storage to allow quarantine and seasonal demand issues (Fig. 18).

Fig. 19 Compost storage at the Waterford city Compost facility.

1.8. ABPR Compliance

The Animal By-Product Regulation (ABPR) was introduced into European legislation in 2002 on the back of concerns over exotic animal diseases such as foot and mouth and BSE. Regulation (EC) No. 1774/2002 of the European Parliament and of the Council of 3 October 2002 lays down health rules concerning animal by-products not intended for human consumption. This regulation defines animal by-products as *"entire bodies or parts of animals or products of animal origin… not intended for human consumption"*. A distinction is drawn between the measures to be implemented in the use and disposal of the material concerned, depending on the nature of animal by- products involved.

Under the Regulation

- A <u>composting plant</u> is defined as *"a plant in which biological degradation of products of animal origin is undertaken under aerobic conditions"* and
- A <u>biogas plant</u> is defined as *"a plant in which biological degradation of products of animal origin is undertaken under anaerobic conditions for the production and collection of biogas"*.

Article 15 of Regulation (EC) No. 1774/2002 requires that biogas plants and composting plants shall be subject to veterinary approval by the competent authority. Under Article 6 of S.I. 248 of 2003, the European Communities (Animal by-products) Regulations 2003 which implements the above Regulation, the Minister at the Department of Agriculture, Fisheries and Food (DAFF) may grant an approval, attach conditions to an approval, revoke or vary a condition, withdraw an approval or refuse an application.

As described in Section 1.8, the option of processing the compost at the back end in accordance with EU 1774 is being pursued. In this configuration, the incoming bio-waste is managed in the fermenters and biocells in accordance with best composting and fermentation practice. At the end of this process and as described, the material is screened @ 12mm and this fine grade material is placed in flow through tunnels that facilitate the attainment of the 70°C protocol with the aid of external heat from the CHP as required. This latter heat re-use option is a distinct advantage of the fermentation/composting configuration. The other advantage of this approach is that former foodstuffs can also be processed thus maximizing the band width of bio-wastes that can be accepted by the facility.

Other aspects of the ABPR that the facility design has addressed include the full enclosure of the building and process with stock-proof fencing around the full waste management facility. In addition, all personnel access doors will be fitted with foot baths.

In accordance with the requirements of the latest guidance document published by DAFF, Clean Ireland will undertake the process of phase 1 and 2 ABPR application based on this facility configuration including the development of the facility HACCP plan in parallel with the facility operators manual and SOPs. Once material is available for pasteurisation, there will be a requirement for the facility to pasteurise six concurrent batches and to produce temperature and pathogen data as part of the final license confirmation process. Specifically, Clean Ireland will expect the facility to achieve validation when six batches have been demonstrated to have achieved the time/temperature requirements of the ABPR and to have passed the *E.coli* and Salmonella testing requirements. This is expected to take approximately six months from the date of reception of the first waste loads.

Celtic Composting Systems have been retained to achieve the ABPR license for the facility having successfully delivered on licenses for Galway City Council, Waddock Composting and Waterford City Council compost facilities in addition to a range of facilities in the UK.

Page No.	Section	Paragraph	Last Title
51	2.3.2.5	3	Wheelie Bin/Truck Wash

All of Section 2.3.2.5 overwritten with the following:

Truck Wash

A proposed truck and wheel wash area will include a leachate holding tank and will be located at the east perimeter to the front of the north face of the waste processing buildings relatively close to the weighbridge as shown on Site Layout Plan Ref C(IRL)WL-02 in Attachment 3. A contained area for truck wash activities will minimise the interaction with the hardstanded area across the site and reduce the leachate production and the potential for entering the surface water drains. There water supply for the washing activities may be sourced from the rainwater harvested on site which will in turn reduce the volume of surface water diverted from the site. There will be no abstraction from surface waters. . Leachate will be collected and then removed from the facility by a tanker and disposed of appropriately by an approved waste contractor.

Page No.	Section	Paragraph	Last Title
52	2.3.2.7	4	Biomass Recovery Plant

All of Section 2.3.2.7 overwritten with the following:

CHP

The CHP unit is supplied with biogas from the respective gas storage units via an individual gas control valve and gas compressor. The CHP units are installed in a separate, noise dampened containerised unit (Fig. 13). The electricity produced by the CHP units is fed into the public grid and/or used for internal consumption. The thermal energy generated by the CHP units is needed in small amounts as process heat (approx. 5 %) in the plant (in-floor heating of dry fermentation chambers, heating of buildings etc.); the surplus thermal energy can be provided for external thermal use. In cases where the thermal energy is not used, the CHPs are equipped with a standard emergency cooling mechanism.

Fig. 14. Containerised CHP at the Decker biogas plant in Northern Germany

The accessories to the gas engines include the compressors, fire and smoke detectors within the room, a separate electrical control cabinet and remote control that enable the supplier to check the biogas engines on a daily basis or according to requirements. Exhaust gas emissions will be in accordance with European standards. Details can be adjusted for local requirements. Noise and exhaust gas quality are based on European regulations. All the safety design is according to German Safety Regulations for Agricultural Biogas Plants. In a situation where the gas engines are out of operation due to maintenance or repair, the biofilters are used in an emergency situation. This possible rather than having an emergency flare, as the AD process within the fermenters can be brought to a matter of hours limiting the potential volume of biogas to be dissipated in an emergency.

This text replaces 2.3.2.7 Biomass recovery Plant

Page No.	Section	Paragraph	Last Title

57	2.3.3	1	Construction Phase –General

- *Construction of Biomass Recovery Plant* to be deleted.

Page No.	Section	Paragraph	Last Title
60	2.3.4 (iv)	3	***Water Requirement & Supply***

All of Section 2.3.2.4 (iv) overwritten with the following:

However, water is required for to carry out the flowing activities on site:

- Biostabilisation Plant
- CHP Engine
- Domestic services
- Truck washing
- Wheel wash in Biostabilisation Plant
- Wheel wash
- Dust spraying during dry periods
- Fire fighting

Fire Hydrant

There is no fire hydrant at the facility or mains water. Clean firewater is retained in a firetruck for the facility with a capacity of 800 litres.

Drinking Water

Drinking water is supplied from either the on-site bored well, which is passed through a filtration system. Alternatively water is sourced from the Drumehilly-Cree group water scheme.

Rainwater Harvesting

Rain harvesting is currently in practice from roof runoff into a tanker at the west face of the processing building. This water provides flushing water for the toilets. Also a 30m^3 tank is designated for firefighting water. Three 30m^3 tanks will collect roof rain from the Biostabilisation Plant for composting activities.

Page No.	Section	Paragraph	Last Title
56	2.3.3	4	Construction Phase-general

Bullet 7

‘ installation of wheel/truck/bin wash and leachate holding tank’

Replaced with

‘ installation of wheel, truck wash and leachate holding tank’

Page No.	Section	Paragraph	Last Title
61	2.3.4	3	Operational

Replace paragraph on Telecommunication and Electricity Supply

Telecommunication is already in place. ESB substation when completed will have an import·capacity·of·420·kva. The energy produced from the CHP engine will meet the majority of the site electricity requirements.

Page No.	Section	Paragraph	Last Title
72	3.1.2.1	2	Noise

All of Section 3.1.2.1 overwritten with the following:

Noise is an identified form of pollution and if uncontrolled can cause nuisance or a deterioration of amenities and quality of human life. The potential impact of the existing and proposed development on noise levels within the area is described in Section 3.7, Noise. In summary, noise levels from existing on-site activities have been established through a noise monitoring programme under the current Clare Co. Co. Waste Permit 002/07/WPT/CL. This data has shown that activities undertaken at the site during night time hours between 7.00a,m. to 8.00 a.m. prior to daytime hours 8.00 a.m. to 10.00 p.m. are elevated over the stipulated limit of 45db at the closest noise sensitive location (c. 126m).Activities identified to create noise during the night time period included the starting up of waste collection trucks and the ballistic separator are giving rise to the exceedance of the limit.

Mitigation has been put in place to reduce activities between 7.00 a.m. and 8.00 a.m. The development of the site will, however, incur increased activities on the site as a direct result of increase in tonnages in the gate. In anticipation of this, the facility is proposing to alter the opening hours of the site. The facility currently operates from 7.30a.m. to approximately 7.30p.m. Monday to Friday and 7.30 a.m. to 1p.m. on Saturday, depending on business demand. This will be increased to accommodate waste acceptance 24 hours Monday to Saturday and 8 a.m. to 6p.m. on Sunday however, it is planned to receive biowaste mainly during the first shift of the day. Actual waste processing will take place over the hours 7a.m. to 12a.m. (midnight) Monday to Saturday and 8 a.m. to 6p.m. on Sunday. This extension to hours provides the business with the opportunity to carry out activities on a 2 shift basis; 7 a.m. to 4p.m. and 4p.m. to 12 a.m. (midnight) for waste processing. In terms of noise emissions the trommel and timber shredder will not be operated outside the hours of 8 a.m. to 7p.m. on any given day. The main processing that will occur during the later shift 4p.m. to 12 a.m. will be indoor activity only (dry recyclables and Biostabilisation Plant duties) where the rollers doors and access doors will remain closed to reduce potential noise emissions. The site will be supervised on a 24 hour basis 8a.m. to 8a.m. Monday to Saturday and 8 a.m. to 6p.m. Sunday by designated supervisor to ensure noise mitigation measures are in place and there is rapid response to emergencies.

Noise levels associated with the temporary construction phase would not result in significant impacts to the ambient noise environment. Traffic associated with the delivery of materials, such a shed cladding may potentially increase vehicular movements and include delivery of structural and building materials to the site by HGVs. To this end, mitigation measures can be developed to reduce these levels significantly such as a phased construction of buildings, planning material delivery times to reduce impact on residents in the area. The operational phase of the biostabilisation units will have no significant impact on noise levels of the ambient environment given that the units are in-vessel and the loading associated with the process will be performed with plant machinery inside the buildings.

Page No.	Section	Paragraph	Last Title
73	3.1.2.2	5	Air pollutants

Fugitive emission paragraph overwritten with:

The proposed project includes a number of mitigation measures to reduce dust generation and abate fugitive dust emissions. Dust generation will be minimised by good working practices during both the construction and operational phases of the development. The proposed project which includes larger development phases Biostabilisation Plant, extension to existing processing sheds, will be developed in a number of phases thus limiting the extent of any exposed areas at any one time.

Page No.	Section	Paragraph	Last Title
74	3.1.2.4	6	Landscape and Visual

All of Section 3.1.2.4 overwritten with the following:

Land use in the vicinity of the project site is predominately agricultural with a number of residences located along the nearby roadways. As discussed in Section 3.8 Landscape and Visual Impacts, the existing processing sheds have been constructed with full planning permission and the proposed C&D waste storage building, timber storage building will be constructed such that the apex of these proposed shed will be at a lower height or inline with the existing structures. The maximum height of the Biostabilisation plant will be at 1.2m above the highest existing building (waste processing sheds 9.5m). The biofilter stack will be 6.5m in height, but as this is at the rear of the Biostabilisation plant, the visibility will be impaired from surrounds view points. The CHP engine will have an emission stack of 8m in height, which will be located adjacent to the building wall. Neither stack is taller than the highest point of the roof and therefore will not be causing and intrusion on the surrounding landscape. To accommodate the extension of the existing waste processing buildings for the timber shredder and the storage of C&D waste the roof height is estimated to be 12.5m to ensure working plant will not cause damage to the interior of the building during operation. The proposed skip storage area will have earthen berms created to conceal skips that may be stored at this area. Existing railway sleepers at the east perimeter and earthen berms with planted trees at the west perimeter have been constructed in such a manner as create minimum visual intrusion on the existing residents and road users, which would reduce long-term visual impacts.

Page No.	Section	Paragraph	Last Title
97	3.3.4	1	Potential Impacts of Proposed Developments

Addendum to paragraph 1.

In addition to hazardous waste arising from End of Life Vehicle processing, Clean (Irl) Refuse & Recycling Ltd. proposes to accept, handle and store certain Hazardous Wastes prior to transfer to waste destination for recovery, process of disposal with EPA approved waste contractors. A full list of these hazardous wastes in included in Attachment 5 (Lists) and attached to this document. Also proposed is the storage of 3,000 tonnes of Refuse Derived Fuel (RDF)which is mixed household waste following removal of organic fraction by mechanical sorting; it is intended that this is baled, wrapped in plastic and stored in a 30m^3 container at the site until transfer abroad where it is used as a renewable fuel is authorised industries.

Paragraph 2, 3 and 4 remain the same.

Page No.	Section	Paragraph	Last Title
98	3.3.5	5	Proposed Mitigation Measures

New paragraphs follow paragraph 5 :

- Specific hazardous wastes will be stored in designated storage areas in a particular manner relative to the type of hazards associated with the individual waste. Clean (Irl) Refuse & Recycling Ltd. has supplied a detailed list of handling and storage of the proposed hazardous waste as attached to this document and to be included in Attachment 5 (Lists) of the EIS. In general, all waste will be storage where rain contact cannot be made and over impermeable concrete surfaces for the protection of soil, surface water and ground water.

- Refuse Derived Fuel (RDF) will be baled indoors and transferred to a parked up container at the rear of the site. It is envisage that the container will be filled (3,000 tonnes) over a period of 6-8 weeks. The container itself will act as a bund. It will however be parked over an impermeable surface at the rear of the facility. There is a low moisture content of the RDF when the organic fraction has been removed so it is not envisaged that leachate will be emanating from the baled waste.

Page No.	Section	Paragraph	Last Title
118	3.4.4	3	Environmental Impacts Biostabilisation Plant

Paragraph 3 overwritten with the following:
The Biostabilisation plant will generate a number of effluents which may be considered to be leachate. This includes the wheel wash effluent & reception building wash down in the interior. Also, a dry fermentation percolate cycle where spraying of the biomass with an activated anaerobic sludge takes place to inoculate the biomass and keep it moist. Leachate is also generated in the compost tunnels during the spraying of the compost to keep it moist. Biofilter condensate is naturally generated from the moisture released from the biofilter media under the biofilter roof.

Page No.	Section	Paragraph	Last Title
119	3.4.4	4	Environmental Impacts

Addendum to Handling and Storage of Raw Materials.

In addition to hazardous waste arising from End of Life Vehicle processing, Clean (Irl) Refuse & Recycling Ltd. proposes to accept, handle and store certain Hazardous Wastes prior to transfer to waste destination for recovery, process of disposal with EPA approved waste contractors. A full list of these hazardous wastes in included in Attachment 5 (Lists) and attached to this document. Also proposed is the storage of 3,000 tonnes of Refuse Derived Fuel (RDF)which is mixed household waste following removal of organic fraction by mechanical sorting; it is intended that this is baled, wrapped in plastic and stored in a 30m^3 container at the site until transfer abroad where it is used as a renewable fuel is authorised industries.

Page No.	Section	Paragraph	Last Title
120	3.4.5	3	Wheelie Bin Wash/Truck Wash/Wheel Wash

Paragraph 3 overwritten with the following & paragraph 4 & 5 deleted

Wheelie Bin Wash/Truck Wash/Wheel Wash
As a mitigation measure, all wheelie bin washing will be relocated off site to a to a alternative location, where this activity will be carried out by the Clean (Irl) Refuse & Recycling Ltd. at a designated and approved location . On site, a truck and wheel wash area will include a leachate holding tank and will be located at the east perimeter to the front of the north face of the waste processing buildings relatively close to the weighbridge as shown on Site Layout Plan Ref C(IRL)WL-02 Rev-1 in Attachment 3. A contained area for truck wash activities will minimise the interaction with the hardstanded area across the site and reduce the leachate production and the potential for entering the surface water drains. The water supply for the washing activities may be sourced from the rainwater harvested on site which will in turn reduce the volume of surface water diverted from the site. There will be no abstraction from surface waters. As there is no public sewer servicing on the site, all washings will be contained in a

sump and pumped to an overground leachate holding tank with a capacity of c.6m^3. Leachate will be collected and then removed from the facility by a tanker and disposed of appropriately by an approved waste contractor. The water supply will be taken from three 30m^3 rain harvesters at the southwest of the facility collecting roof water from the Biostabilisation Plant. This is part of the leachate management program for the facility.

Page No.	Section	Paragraph	Last Title
121	3.4.5	2	Mitigation Measures: Biostabilisation Plant

Paragraph 2 Biostabilisation Plant overwritten with the following:
In order to mitigate the environmental impact of liquids generated in the Biostabilisation Plant, measures will be taken in the infrastructural design and daily operation of the Biostabilisation Plant to manage the liquids generated. The facility will generate a number of effluents that will require management:

(1) Wheel wash effluent & reception building wash down
As a steam cleaner will be used to clean the wheels of exiting vehicles, potentially harmful disinfectants will be avoided. Due to the MBT nature of the facility, this wash down plus the general building floor wash down will be discharged to leachate tank No.1. as indicated on Drawing C(IRL)WL-27.Rev1

(2) Dry fermentation percolate
In order to drain off excess percolate, a series of stainless steel gutters each with grating are built into the fermentation chamber floor. They absorb excess liquid from percolate sprinkling and route it in a controlled way to a gas tight pipe collection system. From the collection pipes the percolate is routed to the insulated covered transfer pump duct into an insulated percolate storage unit. The entire piping system is routed in a frost-proof zone outside the fermentation chamber area. The entire system is closed to ensure that the percolate cannot leave the system in an uncontrolled manner. The percolate tank is indicated on Drawing C(IRL)WL-27.Rev1.

(3) Composting tunnel leachate
The leachate from the tunnels is valved in order to segregate the leachate generated from MBT material from source separated material. The leachate from the MBT material is directed to leachate holding tank No.1 while the leachate from source separated material is directed to a second tank (leachate tank No. 2) as indicated on Drawing C(IRL)WL-27.Rev1

(4) Biofilter condensate
The biofilter condensate will be discharged to leachate tank number 2. C(IRL)WL27.Rev1

As described, there are two separate leachate tanks that will handle MBT and source separated liquors independently. Each will have a set of duty and stand-by pumps to return the respective effluents to the process where applicable. In the case of leachate tank No. 1 containing MBT leachate, this can only be applied to the composting tunnels handling MBT digestate while the contents of leachate tank No. 2 can be readily used as a moistening agent in both the MBT composting tunnels and the source separated composting tunnels. In relation to ABPR concerns, as the effluents are re-used in the process prior to pasteurisation, no by-pass occurs.

Page No.	Section	Paragraph	Last Title
123	3.4.5	3	Mitigation Measures

New paragraphs follow 'Handling and Storage of Raw Materials':

- Specific hazardous wastes will be stored in designated storage areas in a particular manner relative to the type of hazards associated with the individual waste. Clean (Irl) Refuse & Recycling Ltd. has supplied a detailed list of handling and storage of the proposed hazardous waste as attached to this document and to be included in Attachment 5 (Lists) of the EIS. In general, all waste will be storage where rain contact cannot be made and over impermeable concrete surfaces for the protection of soil, surface water and ground water.

- Refuse Derived Fuel (RDF) will be baled indoors and transferred to a parked up container at the rear of the site. It is envisage that the container will be filled (3,000 tonnes) over a period of 6-8 weeks. The container itself will act as a bund. It will however be parked over an impermeable surface at the rear of the facility. There is a low moisture content of the RDF when the organic fraction has been removed so it is not envisaged that leachate will be emanating from the baled waste.

Page No.	Section	Paragraph	Last Title
130	3.5.4	2	Potential Impacts of Proposed Developments.

Line 5 overwritten:
The percolation area is situated to the back of the site adjacent to the proposed Biostabilisation Plant.

Page No.	Section	Paragraph	Last Title
130	3.5.4	4	Potential Impacts of Proposed Developments

Additional paragraph:

In addition to hazardous waste arising from End of Life Vehicle processing, Clean (Irl) Refuse & Recycling Ltd. proposes to accept, handle and store certain Hazardous Wastes prior to transfer to waste destination for recovery, process of disposal with EPA approved waste contractors. A full list of these hazardous wastes in included in Attachment 5 (Lists) and attached to this document. Also proposed is the storage of 3,000 tonnes of Refuse Derived Fuel (RDF)which is mixed household waste following removal of organic fraction by mechanical sorting; it is intended that this is baled, wrapped in plastic and stored in a 30m^3 container at the site until transfer abroad where it is used as a renewable fuel is authorised industries.

Page No.	Section	Paragraph	Last Title
131	3.5.5	4	Proposed mitigation measures

Paragraph to be inserted after paragraph 4 and before paragraph 5.

- Specific hazardous wastes will be stored in designated storage areas in a particular manner relative to the type of hazards associated with the individual waste. Clean (Irl) Refuse & Recycling Ltd. has supplied a detailed list of handling and storage of the proposed hazardous waste as attached to this document and to be included in Attachment 5 (Lists) of the EIS. In general, all waste will be storage where rain contact cannot be made and over impermeable concrete surfaces for the protection of soil, surface water and ground water.

- Refuse Derived Fuel (RDF) will be baled indoors and transferred to a parked up container at the rear of the site. It is envisage that the container will be filled (3,000 tonnes) over a period of 6-8 weeks. The container itself will act as a bund. It will however be parked over an impermeable surface at the rear of the facility. There is a low moisture content of the RDF when the organic fraction has been removed so it is not envisaged that leachate will be emanating from the baled waste.

Page No.	Section	Paragraph	Last Title

133	3.6.1	2	Overview of Potential Pollutants

The following overwrites paragraph 2 and 3.

The proposed infrastructure development will include:

- Biostabilisation Plant (dry fermentation, in vessel composting tunnels, biofilter)
- Extension to existing processing buildings
- Relocation of glass bunkers
- Provision to End of Life Vehicle unit
- Relocation of existing diesel tank bunded storage area
- Truck wash area
- Wheel wash
- Combined Heat Power (CHP) Plant
- Hardstanding skip storage area

The facility will continue with the existing waste processes which include, dry recyclable processing, wet waste processing, baling of material , dropdown skip processing, timber shredding processing, construction and demolition waste processing. The additional infrastructure will allow the continuation of the existing processes and also will accommodate a Biostabilisation Plant, use of methane gas in a CHP engine, provision of an End of Life Vehicle unit, truck wash & wheel wash, hazardous waste storage, Refuse Derived Fuel (RDF) storage and additional Skip storage.

Page No.	Section	Paragraph	Last Title
135	3.6.1	3	Overview of Potential Pollutants

Paragraph 3 overwritten with the following:

The primary sources of incomplete combustion products at the facility will be traffic derived pollutants. An existing source of incomplete combustion products is the use of an onsite diesel generator. This is used to power the process machinery within the wet and dry waste buildings. A minor source of these parameters would be the existing woodchip boiler.

Operations associated with the Biostabilisation Plant will lead to incomplete combustion, with the primary source being from the loading shovel diesel engine and from the CHP engine processing the biogas generated by the fermenters. The diesel exhaust will be captured by the facility ventilation system with particulates and hydrocarbons being retained in the biofilter for bio-degradation. Any remaining gaseous by-products (NOx & CO) will be discharged to atmosphere. The CHP engine lean burn combustion control system guarantees the correct air/fuel ratio under all operating conditions to minimize exhaust gas emissions whilst maintaining stable operation. In combination with this, the gas mixer balances out fluctuations in calorific value, which can occur in biogas plants. Nevertheless there will be impurities in the exhaust these include, nitrogen oxide, carbon monoxide, sulphur oxides, particulates and some hydrocarbons. The presence of nitrogen in the atmosphere and the impure mixture of hydrocarbons that is typical of most fuels result in a number of reaction by-products. All of these by-product emissions will be managed through the proper operation of the engine to ensure that EU emission limits are not exceeded.

Page No.	Section	Paragraph	Last Title
139	3.6.1	4	Overview of Potential Pollutants

Additional paragraphs

Noxious Gases

The dry fermentation process involves the anaerobic decomposition of waste under anaerobic conditions with the production of biogas. In addition, composting is the bio-gasification of bio-waste under aerobic conditions. As a result, a large proportion of the organic material present in the in-coming material is transformed into a gaseous state during the process. The primary gases involved include methane, water vapour and carbon dioxide. The Bioferm and Celtic Composting technologies are designed to minimise the exposure of the operator and other personnel to the risks of this potentially harmful atmosphere.

In addition, many other gases will be present in trace amounts. These include ammonia, organic acids, alcohols, sulphides and other odorants. Under normal operating conditions, these gases are subject to double containment within the composting tunnels and the gases are predominantly retained within the odour abatement and CHP systems prior to discharge to atmosphere after treatment. Within the building, elevated concentrations of the gases due to fugitive emissions are kept to a minimum through the use of the ventilation system. The level of ventilation is typically increased during feedstock handling periods, i.e. when the material in the tunnels is being turned or when fresh biowaste is being mixed with partially fermented biowaste during the AD process. At these times, high levels of fugitive emissions will occur within the building and as a result, these operations are typically undertaken by operators within air conditioned loader cabs. High rates of air exchange in the tunnels and transfer corridors are maintained at these times to maximise visibility, to maintain high oxygen concentrations and to keep the concentrations of potentially harmful gases at non-toxic levels.

Page No.	Section	Paragraph	Last Title
151	3.6.3.2	3	Operational Phase

Paragraph 3 overwritten with the following:

The principal sources of air emissions from the operational phase of the proposed development include:

- Traffic movements in and out of the facility
- Operation of the C&D waste processing line
- Operation of the timber shredder
- The biostabilisatiocn process & biofilter
- Windblown Dust from on site activities
- Operation of the diesel generator
- Operation of CHP engine

Page No.	Section	Paragraph	Last Title
152	3.6.3.2	2	Operational Phase

Paragraph 2 overwritten with the following:

Incomplete Combustion Products

The primary sources of incomplete combustion products during the operational phase at the facility will be traffic derived pollutants from the additional traffic movements. An existing source of incomplete combustion products is the use of an onsite diesel generator. A minor source of these parameters would be the existing woodchip boiler.

Operations associated with the Biostabilisation Plant will lead to incomplete combustion, with the primary source being from the loading shovel diesel engine and from the CHP engine processing the biogas generated by the fermenters.

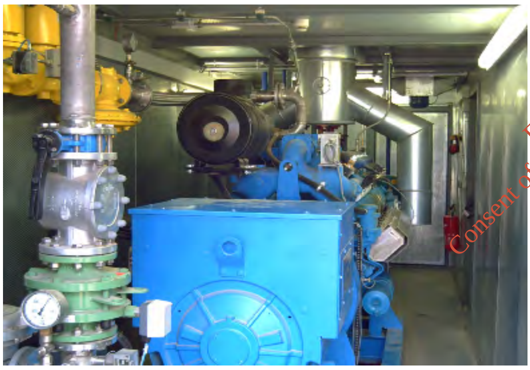
Page No.	Section	Paragraph	Last Title
154	3.6.3.2	2	Operational Phase

Entire Biomass Gasification Plant Paragraph overwritten by the following:

Combined Heat Power (CHP) Engine

It is proposed as part of the development of the site to include a CHP engine within the Biostabilisation Plant building. At present the facility already operates a wood chip boiler which is supplied by the timber shredding process that takes place at the facility. This woodchip boiler generates a maximum of 26kW and supplies heated water to the on site showers and heating requirements. The introduction of a CHP engine will supply electricity for the composting/fermentation process with the opportunity to export excess to the national grid. The gas engine will be procured with the development of the Biostabilisation Plant and would not be un-similar to the gas engine shown in Attachment 7 Additional Information and attached with this document. Such an engine is capable of an electrical output of 526 kW el. and 558 kW of a recoverable thermal output (180°C).

The CHP unit is supplied with biogas from the respective gas storage units via an individual gas control valve and gas compressor. The CHP units are installed in a separate, noise dampened containerised unit. The electricity produced by the CHP units is fed into the public grid and/or used for internal consumption. The thermal energy generated by the CHP units is needed in small amounts as process heat (approx. 5 %) in the plant (in-floor heating of dry fermentation chambers, heating of buildings etc.); the surplus thermal energy can be provided for external thermal use. In cases where the thermal energy is not used, the CHPs are equipped with a standard emergency cooling mechanism. An example of such a unit is shown below:



The accessories to the gas engines include the compressors, fire and smoke detectors within the room, a separate electrical control cabinet and remote control that enable the supplier to check the biogas engines on a daily basis or according to requirements. It is proposed that the emissions from the gas engines are ducted into an 8 m high stack. The location and physical characteristics of the emission stack and the maintenance of the gas engine will be carried out in such a manner as to ensure any potential emissions from the stack will not result in any exceedance of appropriate air quality standards or result in a significant impact on the ambient air quality of the surrounding environment.

Page No.	Section	Paragraph	Last Title
155	3.6.3.2	4	Odour

Paragraphs on odour are overwritten with the following:

Odour

Based on the proposed development description, the main proposed activity that has the potential to generate significant odours is the operation of the bio stabilisation the facility. Odours may arise from the handling and tipping of feed stock, screening of biowaste, blending and shredding of feed stock, storage of feed stock, and the composting and fermentation processes. However, given that the composting and fermentation process are undertaken in fully enclosed concrete tunnels, the odour potential is significantly reduced. The mechanical separation of black bin waste in the adjacent section will also give rise to odours. Nevertheless all of the processes mentioned above will be carried out within an enclosed building.

An odour management plan will be put in place at the facility and will outline a of operational conditions that will be enforced to minimise the production of odour. These conditions include:

- Rejection of overly odorous feed stock loads
- Maintenance of the appropriate Carbon/Nitrogen ratio of feedstock blends to prevent ammonia formation
- Strict maintenance of aerobic conditions at all times within the compost mass
- Adherence to a closed door policy to prevent the escape of any fugitive emission from the process buildings
- Maintain the negative pressure conditions within the reception areas to prevent escape of odours to the environment
- Collect any leachate produced and re-use in blending of new batches of compost
- Maintain a clean site and prevent and occurrence of standing water

Page No.	Section	Paragraph	Last Title
157	3.6.3.2	1	Bioaerosols

Paragraph 1 overwritten

….. This treatment process will also significantly reduce any bio-aerosols produced. Any bio-aerosols produced will have to pass through the biofilter prior to release to atmosphere. The high moisture level in the biofilter will significantly reduce the levels of this parameter reaching the ambient air environment.

Page No.	Section	Paragraph	Last Title
159	3.6.4.2	2&3	Biomass Gasification Plant

Over written with the following:

CHP Engine

The operation of this plant will be in line with BAT requirements Exhaust gas emissions will be in accordance with European standards. Details can be adjusted for local requirements. Noise and exhaust gas quality are based on European regulations. All the safety design is according to German Safety Regulations for Agricultural Biogas Plants. In a situation where the gas engines are out of operation due to maintenance or repair, surplus biogas routed through the biofilter. The biofilter will be used in place of a flare in emergency situations. This is possible as the AD process within the fermenters can be brought to a stop in a matter of hours limiting the potential volume of biogas to be dissipated in an emergency. The emergency flare has a fully covered flame and is automatically turned on by the level control of the gas holder. It burns biogas at about 800 – 850 °C and follows international standards for this duty.

The plant itself will be a new previously unused piece of equipment that will operate to the highest technical specifications. It is a positive environmental impact that products from the Biostabilisation process are used to generate energy that is inputted back into the composting process. This will reduce the environmental impact of the proposed composting process, result in a significant reduction in the use of fossil fuels, reduce the number of deliveries of diesel fuel to the site and hence the possible carbon foot print of the facility.

Page No.	Section	Paragraph	Last Title
159	3.6.4.2	4	Odour

Section on Odour to be overwritten with the following:

The main sources of odour generation associated with the development of the site will be the AD and composting processes. The odour abatement system consists of the compost aeration system described previously, the building ventilation system including ventilation piping installed in the roof space of the reception/process building, ventilation blowers, enclosed biofilter and discharge stack.

While the building is designed to be operated under slight negative pressure (1-4 air changes per hour), the air handling design for the building has been developed to minimize the volume of air to be handled and consequently the biofilter size:

(A) The management of all raw bio-waste through the dry fermentation process results in all emissions from this process to be directed to the CHP. The resultant thermal oxidation of the anaerobic exhaust will give greater than 99% reduction in odour from the bio-waste while being maintained under anaerobic conditions.

(B) The uncontaminated air space above the tunnels and fermenters is isolated from the main building to avoid the requirement to biofilter this void space. This is ventilated directly to atmosphere with no consequential odour risk.

(C) The interior of the building is coated with a polyurethane coat for corrosion protection and also to seal the building so that a low to moderate air exchange rate can be facilitated without risk of fugitive emissions.

(D) As all of the composting process occurs within sealed biocells and tunnels with a low head space, air re-circulation is applied to minimize exhaust generation and thus reduce the biofilter load.

As a result, the ventilation of the main building void is designed for 1-4 air changes per hour. This will allow for rapid clearance of any fog from the building during material movement between biocells/tunnels and screening while minimizing fugitive emissions from the building. This air is mixed with hot and humid exhaust from the aerobic tunnels passed through the biofilter to reduce the odour output from the facility down to levels in compliance with the EPA license and to ensure that sensitive receptors are not impacted by the facility's operation.

Page No.	Section	Paragraph	Last Title
160	3.6.4.2	5	Bio-aerosols

This section on bioaerosols is overwritten with the following:

Bioaerosols are air-borne particles, which contain viable microbes from the composting process, e.g. *Aspergillus fumigatus* and associated endotoxins. There has been some concern that these microbes may cause respiratory disease and infections, e.g. farmers lung, in compost facility workers. However, there is little epidemiological evidence that it is a serious risk as very few cases of respiratory problems have been associated with compost facility workers to date. Nevertheless, bio-waste facilities should be designed and operated to minimise these risks. The levels of bioaerosols and endotoxin in the air at composting facilities are closely correlated with dust levels. Consequently, the facilities and operations themselves should be designed to minimise dust generation. In this regard the combined dry fermentation and in-vessel composting facility has been designed with this in mind, i.e. maximum enclosure, moist feed stock conditions and minimal agitation. Nevertheless, significant dust can arise at certain stages of operations.

In the Clean Ireland facility, the input material will typically be relatively wet and does not generally generate dust upon delivery. However, dust can arise within the MSW pre-processing line, during material movement and during compost screening prior to pasteurisation. As much of the operational procedures are conducted within the confines of the cab of the loader, the air conditioning and filtration will protect the operator from the dust and bio-aerosols that will arise. Pedestrian operatives will wear face masks during potentially dusty operations.

Page No.	Section	Paragraph	Last Title
162	3.7.1	2	Noise & Vibration Introduction

Proposed hours of operation:

7a.m. to 12a.m. Monday to Saturday
8 a.m. to 6p.m. Sunday

Proposed hours of waste acceptance/handling:

8a.m. to 8a.m. Monday to Saturday
8a.m. to 6p.m. Sunday

Proposed hours of any construction and development works at the facility and timeframes:
9a.m. to 6p.m. Monday to Friday
9a.m. to 1p.m. Saturday

Page No.	Section	Paragraph	Last Title
173	3.7.2	2	Results of Baseline Noise Survey

Line 4 Replace:
'Appendix 1 outlines the noise locations on site' with 'C(IRL)WL-06Rev1 outlines the noise locations on site'.

Page No.	Section	Paragraph	Last Title
180	Table 3.7.9	(xi)	Noise Generation in relation to Activity

Replace Activity (ix) Wheelie Bin/truck wash to Truck wash
Replace Activity (xi) Biomass Recovery Plant with CHP engine

Page No.	Section	Paragraph	Last Title
181	Table 3.7.10	(x)	Noise Generation in relation to Activity

Replace Activity (x) 'construction of biomass recovery plant' with Activity (x) 'Installation of CHP engine'.
Replace Potential Noise Impact (x) 'concrete trucks, materials and equipment delivery with Potential Noise Impact' (x) 'hoists, HGV delivery with CHP engine and gas storage tanks and installation of associated infrastructure'.

Page No.	Section	Paragraph	Last Title
182	3.7.4	1	Mitigation Measures

Prior to bullets beginning with ‘ Proper training…’ the following is inserted:

Operational Hours:
Mitigation has been put in place to reduce activities between 7.00 a.m. and 8.00 a.m. The development of the site will, however, incur increased activities on the site as a direct result of increase in tonnages in the gate. In anticipation of this, the facility is proposing to alter the opening hours of the site. The facility currently operates from 7.30a.m. to approximately 7.30p.m. Monday to Friday and 7.30 a.m. to 1p.m. on Saturday, depending on business demand. This will be increased to accommodate waste acceptance 24 hours Monday to Saturday and 8 a.m. to 6p.m. on Sunday however, it is planned to receive biowaste mainly during the first shift of the day. Actual waste processing will take place over the hours 7a.m. to 12a.m. (midnight) Monday to Saturday and 8 a.m. to 6p.m. on Sunday. This extension to hours provides the business with the opportunity to carry out activities on a 2 shift basis; 7 a.m. to 4p.m. and 4p.m. to 12 a.m. (midnight) for waste processing. In terms of noise emissions the trommel and timber shredder will not be operated outside the hours of 8 a.m. to 7p.m. on any given day. The main processing that will occur during the later shift 4p.m. to 12 a.m. will be indoor activity only (dry recyclables and Biostabilisation Plant duties) where the rollers doors and access doors will remain closed to reduce potential noise emissions. The site will be supervised on a 24 hour basis 8a.m. to 8a.m. Monday to Saturday and 8 a.m. to 6p.m. Sunday by designated supervisor to ensure noise mitigation measures are in place and there is rapid response to emergencies.

Also changed;

- Alter existing operational hours from 7.30a.m. to 8 a.m. to be DELETED
- The engine associated with the Biomass Recovery Plant will have noise reducers in line with best available technology to be REPLACED by ‘The engine associated with the CHP will have noise reducers in line with best available technology’

Page No.	Section	Paragraph	Last Title
183	3.7.4	Bullet 5&6	Biostabilisation Plant Operation

Bullets 5& 6 to be deleted and the following inserted:

- All other equipment on site, including mixers, conveyors, screens, mechanical sorting of (MSW) equipment, blowers, will be equipped with quiet electric motors and housed indoors.

Page No.	Section	Paragraph	Last Title
194	3.8.4	1	Future Road Network- Environmental Impacts Construction Phase

Replace bulled’ Construction of Biomass recovery plant’ with ‘installation of CHP engine and gas storage tanks’.

Page No.	Section	Paragraph	Last Title
216	3.10.3	1	Significance

The full paragraph to be replaced with the following:

The operation of the existing waste transfer station has significantly altered the landscape from its previous use (pre 1984 agricultural usage). The proposed development requires an increase in the dimensions and scope of existing buildings. The new buildings to be constructed are to be built adjacent to the existing waste handing facility and as such represent an extension of the existing building complex rather than the construction of a new stand alone structure. It is not proposed to increase the height of the existing waste processing buildings; however the proposed Biostabilisation Plant will have an apex 1.7m higher than the existing apex of the waste processing buildings (9m). The stack associated with the CHP Engine will be 8m from the ground. The biofilter stack will be installed at a height of 6.5m above ground levels. The sizing of the diameter of the stacks have not been decided on at this stage and this may affect the significance of the visual impact of the stack. The existing views are outlined in the following pages. Although, the existing structures strongly influence the immediate area around the site, views towards the site from residential dwellings and roads around the site vary as local topography and vegetation often obscure clear views of the site.

Page No.	Section	Paragraph	Last Title
216	3.10.3	2	Sensitivity

Line 4 Delete Biomass Recovery Plant.

Page No.	Section	Paragraph	Last Title
217	3.10.4	3	Visual Assessment

The full paragraph to be replaced with the following:

Development at the south of the site may give rise to a moderate visual impact to surrounding dwellings on the east and west taking into account that the highest apex will rise 1.7metres above the existing apex (9metres) of the waste processing buildings. The CHP engine stack height (8m) and the biofilter (6.5m) stack will not rise above the highest apex of the Biostabilisation plant.

Also replacing on page 217 with

Construction Phase/Site Development:

- Biostabilisation Plant (dry fermentation, in vessel composting tunnels, biofilter)
- Extension to existing processing buildings
- Relocation of glass bunkers
- Provision to End of Life Vehicle unit
- Relocation of existing diesel tank bunded storage area
- Truck wash area
- Wheel wash
- Combined Heat Power (CHP) Plant
- Hardstanding skip storage area

Page No.	Section	Paragraph	Last Title
218	3.10.4	1	Construction Phase/Site Development

Replace 'Installation of wheel/truck/bin waste and leachate holding tank with 'Installation of truck wash and leachate holding tank'

Replace 'Construction of Biomass Recovery Plant' with 'Installation of CHP engine and storage tanks'

Page No.	Section	Paragraph	Last Title
220	3.10.4	n/a	Views

Plate 3.10.3 indicating location of proposed stack and biomass recovery plant – label, text obsolete.

Page No.	Section	Paragraph	Last Title
230	3.10.5	2	Mitigation Measures

Replace bullet 'The stack will be painted to blend in with the proposed structures, and where the height of the stack rises above the highest apex of the proposed buildings, the colour of the stack will be such that it will correspond with the natural skyline' with

The stack will be painted to blend in with the proposed structures.			
237	3.12.4	5	Water Usage
Paragraph overwritten: Water for domestic purposes will continue to be supplied from either the onsite bored well or the Dromehilly Group Water Scheme. Rain harvesting is practiced for domestic sewage also. Operational water use is low for washing of trucks. The wheel wash will be used as efficiently as possible to reduce water consumption at the facility.			
Page No.	Section	Paragraph	Last Title
238	3.12.4	1	Electricity Supply
Replace: 'electricity from a biomass recovery unit. There will be no change to the existing ancillary works as part of this development as an ESB substation has been introduced to the site.' With 'electricity from a CHP engine. There will be no change to the existing ancillary works as part of this development as an ESB substation has been introduced to the site.'			
Page No.	Section	Paragraph	Last Title
240	3.12.2	3	Human Beings: Air/Traffic/Landscape
Replace sentence: 'There two main direct emissions to air for the proposed upgrade of the facility namely, the biofilter and the CHP engine.			

Amendments to EIS ATTACHMENTS submitted to EPA on 23rd December 2008

1. Amended Attachments
   a. Attachment 2 Drawings **SEE INDIVIDUAL HARDCOPY/PDF FILE**

Drawing no:	Description
C(IRL)WL-01 Rev 1	Existing site layout & proposed redline
C(IRL)WL-02 Rev 1	Proposed Site Layout (redline only)
C(IRL)WL-06 Rev 2	Environmental monitoring locations existing with proposed redline only
C(IRL)WL-10 Rev 1	Emissions to air
C(IRL)WL-12 Rev 1	Services plan
C(IRL)WL-19 Rev 1	Surface Water Drainage Plan
C(IRL)WL-23 Rev 1	Hardstanded area
C(IRL)WL-25 Rev 1	Noise Emissions
C(IRL)WL-27 Rev 1	General Arrangements

   b. Attachment 5 Lists **SEE INDIVIDUAL HARDCOPY/PDF FILE**
      Hazardous Waste/Storage (new)

   c. Attachment 7 Previously 'Biomass Recovery Plant' now amended to 'Additional Information' **SEE INDIVIDUAL HARDCOPY/PDF FILE**
      CHP engine technical specifications (new)
      CHP engine emissions data (new)
      Biostabilisation Plant pictorial illustration (new)
      Waterford Data (new)

   d. Attachment 9 **SEE INDIVIDUAL HARDCOPY/PDF FILE**
      Biostabilisation Plant Operation CIR20-128Rev.2

Attachment 11 Non-Technical Summary

Page No.	Section	Paragraph	Last Title
3	2.2	4	Initial Development Phase

Paragraph 4 overwritten by the following:

In terms of the existing area of the site, the only increase to the site area under the proposed development will be an increase in area of c.0.4ha at the north of the facility thereby extending the site to the north only. The existing processing buildings and site infrastructure (ballistic separators, balers, conveyor belts) will not be impacted by the introduction of the new processes and development of the site. The most significant development of the site will be localised to the most southerly section of the site where it is proposed to build a biostabiliation plant with adjacent biofilter. The Biostabilisation plant will house a CHP engine which will utilise biogas to generate electricity with potential to feed into the national grid. Extensions to the existing processing buildings, relocation of the glass bunkers, installation of diesel storage bunded unit, and the creation of End of Life Vehicle unit will be secondary in terms of the scale of the development.

Page No.	Section	Paragraph	Last Title
4	2.2	2	Initial Development Page

Bullet Points overwritten by the following:

- Stripping of field and overlaying with hardcore
- Construction of earthen berms skip storage area
- Hardstanding Phase 1 of skip storage area
- Construction of extensions to processing buildings
- Construction of glass bunkers
- Construction of End of Life Vehicle Unit
- Installation of wheel/truck wash and leachate holding tank
- Construction of Biostabilisation Plant and Biofilter
- Hardstanding Phase 2 of skip storage area
- Ongoing hardstanding of the hardcore areas

Page No.	Section	Paragraph	Last Title
5	2.2	1	The Introduction of new waste process/activities which will include

Paragraph overwritten by the following:

The introduction of new waste processes/activities which will include:

- Biostabilisation (dry fermentation and in vessel composting tunnels) of source segregated brown waste and organic fines from Municipal Solid Waste (MSW) using mechanical separation technique
- Utilisation of Biogas from dry fermentation process in a CHP Engine to providing heat and electricity
- End of Life Vehicle processing
- Hazardous waste acceptance and storage
- Storage of Refuse Derived Fuel (RDF)
- Truck wash
- Wheel wash
- Skip storage

Proposed hours of operation:

7a.m. to 12a.m. Monday to Saturday
8 a.m. to 6p.m. Sunday

Proposed hours of waste acceptance/handling:

8a.m. to 8a.m. Monday to Saturday
8a.m. to 6p.m. Sunday

Proposed hours of any construction and development works at the facility and timeframes:
9a.m. to 6p.m. Monday to Friday
9a.m. to 1p.m. Saturday

Page No.	Section	Paragraph	Last Title
5	2.2	2	Biostabilisation

Paragraph overwritten by the following:

Clean (Irl) Refuse & Recycling Ltd. is proposing to build and operate a state-of-the-art, totally enclosed facility to convert up to 15,000 tonnes per year of biodegradable materials found in the residential and commercial waste streams into fully stable and marketable soil amendment products. This facility will utilise proven, best available control technologies and best management practices for processing biodegradable waste materials, such as landscape materials, food, wood and non-recyclable paper, into valuable soil enhancing products while minimising any potential impacts to the environment or nuisances to neighbours.

The reception and pre-treatment of the bio-waste will occur within the waste reception building. The bio-waste is loaded into dry fermentation chambers for a duration of 28 days. Digestion (AD) process is initiated through the spraying of activated anaerobic percolate onto the biomass. The biomass is heated to 37-40^{o}C and biogas production is facilitated. This biogas is drawn off the tunnels and stored prior to use as fuel in a CHP gas engine. 50% of the load is transferred to incoming stock and 50% is transferred to the composting tunnel, giving each particle a retention time of 56 days. The next step takes involves in-vessel composting of the bio-waste where the treatment takes place is closed aerated tunnels for 14-28 days. Following composting, screening of the material will take pace to separate different size particles. The screened compost is transferred to a pasteurisation tunnel and heated in the presence of oxygen to 60-80 degrees C for sixty minutes in accordance with the Animal by-products regulations. After the pasteurisation, the blowers automatically revert to heat exchange mode to bring the temperature down and thus facilitate further mesophillic maturation during the remaining 4-7 days. The final product is transferred to the compost storage area at the rear of the biosatbilisation plant. .

Page No.	Section	Paragraph	Last Title
6	2.2	2	Biostabilisation

Line 5 Delete – Or within the tunnels or curing area's.

Page No.	Section	Paragraph	Last Title
6	2.2	4	Wheelie Bin

Paragraph Overwritten by the following:

Truck wash
A truck wash area will be situated at the north east perimeter to with a leachate holding tank for washings of trucks. The activity will be fully contained and will not have the potential to contaminate surface water on site.

Page No.	Section	Paragraph	Last Title
7	2.2	1	Biomass Recovery

Paragraph overwritten by the following:

CHP Engine (electricity production)
A CHP engine will be housed in the Biostabilisation plant. Biogas generated during the fermentation process will be stored in gas storage tanks and used as required. The biogas will be used by the engine to generate heat and power, sufficient to meet the demands of the running of the Biostabilisation plant and also with potential to export to the national grid.

Page No.	Section	Paragraph	Last Title
9	3.1	2	Human Health

Paragraph overwritten by the following:

A number of air pollutants have known or suspected harmful effects on human health and the environment. In many areas these pollutants are principally the products of combustion from space heating, power generation or from motor vehicle traffic. The air pollutants derived from the waste activities can be separated into traffic derived emissions, dust deposition, biofilter emissions and CHP engine emissions. The presence of on-site vehicles will give rise to NO_2, BTEX and SO_2 emissions. Good site practices will be implemented to minimise these emissions. All vehicles and machinery will be switched off when not in use to eliminate any unnecessary emissions. Dust minimisation measures will be implemented during the construction phase of the project in order to reduce the potential for the migration of dust from the site and from the construction traffic using public roads. Full enclosure of the composting process will ensure that the emission of bio-aerosols to the surrounding environment will be minimised and that the levels of this parameter will not have a significant impact on the surrounding environment. The CHP engine will be state of the art using BAT to ensure reduction of potential air pollutants.

Page No.	Section	Paragraph	Last Title
9	3.1	3	Site Structure/ land use

Paragraph overwritten by the following:

Site Structure / Land Use

Land use in the vicinity of the project site is predominately agricultural with a number of residences located along the nearby roadways. The maximum height of the Biostabilisation plant (apex 10.7m) will be slightly lower than that of the highest apex of existing buildings (waste processing sheds apex 10.84m). The biofilter stack will be 6.5m in height, but as this is at the rear of the Biostabilisation plant, the visibility will be impaired from surrounding view points. The CHP engine will have an emission stack of 8m in height which will be located adjacent at the rear wall of the Biostabilisation building. Neither stack is taller than the highest point of the roof and therefore will not be causing any intrusion on the surrounding landscape. To accommodate the extension of the existing waste processing buildings for the timber shredder and the storage of C&D waste, the maximum apex of the extension will be 12.23m to ensure working plant will not cause damage to the interior of the building during operation. The proposed skip storage area will have earthen berms created to conceal skips that may be stored at this area. Existing railway sleepers at the east perimeter and earthen berms at the west perimeter have been constructed in such a manner as create minimum visual intrusion on the existing residents and road users, which would reduce long-term visual impacts. Landscaping at the southern and eastern berm contribute to the visual aspects of the site.

Page No.	Section	Paragraph	Last Title
10	3.1	4	Socio-Economic

Paragraph overwritten by the following:

- Service required (electricity, telecommunications, etc.) for the development will be obtained through existing service lines and introduction of the CHP engine to generate electricity for the operation of the site.

Page No.	Section	Paragraph	Last Title
10	3.2	5	Flora & Fauna

Paragraph overwritten by the following:

A baseline surveys were undertaken by Bord na Móna Technical Services during the summer of 2008.

Page No.	Section	Paragraph	Last Title
12	3.3	3	Impacts of the proposed developments

Paragraph overwritten by the following:

Impacts of the Proposed Development

Due to the nature of the waste activities on site, there is the potential for the discharge of potential polluting substances into the subsurface such as leachate from waste handled on site, storage of hazardous waste, hydrocarbons from vehicles and fuel storage. Mitigation measures and best practice operations ensure there is no negative impact on the underlying subsurface. The site is covered with hardstanding to protect the underlying subsurface.

Page No.	Section	Paragraph	Last Title
12	3.3	4	Mitigation Measures

Line 2 – Hazardous waste storage area. – Delete

Page No.	Section	Paragraph	Last Title
13	3.4	4	Mitigation Measures

Paragraph overwritten by the following:

Leachate will be generated in the reception hall and curing area of the Biostabilisation Plant. All leachate within the Biostabilisation building will be self-contained due to the proposed design of the floor area and building. Two overground leachate tanks will have a capacity such that all leachate generated from the floor area may be stored. Wheel wash and truck wash will be carried out in designated areas where all leachate will be contained and removed off site for disposal with an approved waste contractor. Glass, Timber and C&D waste will be stored indoors. Baled waste will be stored indoors, baled RDF, material will be stored in containers until removed from site. The hardstanded areas will be extended to cover the entire site and surface water discharged from the facility will passed through an oil/silt interceptor

All hydrocarbons and hazardous waste from the depollution of End of Life Vehicles will be in designated bunds, quarantine items will be indoors and in designated containers. All hazardous waste will be stored in quarantine items, which will be indoors and in designated containers

Page No.	Section	Paragraph	Last Title
14	3.5	2	Hydrogeology

Paragraph overwritten by:

Groundwater abstractions on site are minimal and are considered similar to that of a small farm and domestic residences, water requirements for the composting process will be met for the most part by harvesting roof water in three $30m^3$ tankers located adjacent to this plant. These low abstraction rates will not be significantly increased and are not considered to have a negative impact on the underlying aquifer.

Page No.	Section	Paragraph	Last Title
14	3.5	4	Potential Impacts of the proposed Developments

Paragraph overwritten by

Potential Impacts of the Proposed Development

Due to the nature of the waste activities on site, there is the potential for the discharge of potential polluting substances into the groundwaters such as leachate from waste handled on site, hazardous waste storage and hydrocarbons from vehicles and fuel storage. Mitigation measures and best practice operations ensure there is no negative impact on the underlying groundwaters.

Page No.	Section	Paragraph	Last Title
15	3.6	5	Mitigation Measures

Line 1 – Biomass recovery plant - Replaced by: CHP Engine

Page No.	Section	Paragraph	Last Title
16	3.7	5	Mitigation measures

Line 4 - Biomass recovery plant - Replaced by: CHP Engine

Page No.	Section	Paragraph	Last Title
19	3.10	1	Mitigation Measures

Paragraph Overwritten by:
The visual impact will be minimised through the appropriate mitigation measures follows:

- Existing berms, hedgerows and landscaping at the east and south perimeter will be maintained
- Buildings will be constructed to be uniform with existing buildings and will reflect typical agricultural structures in the area
- Southern boundary will be fully stabilised and planted following construction works