D.1.i. Waste Inspection areas

As per D.1.h

D.1.j. Traffic Control

Traffic entering the facility will be directed to the designated car parking areas in the case of employees and visitors and to the weighbridge in the case of waste vehicles. All traffic entering the waste reception and processing building must pass over the weighbridge. Similarly, vehicles will be weighed when exiting the site. A turning circle will be been provided to allow vehicles that may be over or under weight to return to the facility to amend their load before passing over the weighbridge once again.

D.1.k Sewerage and Surface Water Drainage

Surface water run-off from the hardstanding areas and buildings will be collected within the drainage channels that are located at various locations across the site. Surface water will be discharged via an interceptor to an attenuation pond prior to discharge to the Mongagh River.

Foul water generated from welfare facilities and intermittent washdown in the waste reception and processing building will be directed to and treated on-site using a proprietary package wastewater treatment plant, such as Bord na Móna Puraflo unit or similar. Effluent from this unit will be discharged to the Mongagh River.

In addition, rainwater from the waste reception and processing building will be harvested using a Bord na Móna Rainsava unit or similar for reuse in grey water applications through out the site.

D.1.l All Services

Please refer to attached Engineering Services Report for information regarding existing and future site services.

D.1.m Plant Sheds and Garages

Waste Reception and Processing Building

The Waste Reception & Processing Building will be a single storey construction with internal floor area of 6,810m^2 approximately. It will be subdivided internally by reinforced concrete walls and cladding partitions. The subdivided areas are the materials recovery area (4,674 m^2 approx), the waste transfer area (1,583 m^2) and the biowaste reception and processing area (552 m^2).

The structure will be based on a steel portal frame on reinforced concrete foundations. The external envelope will be formed using a cladding panel to approved fire resistant specification. Opaque rooflights and side panels will be included to maximize the use of natural daylight. Steel roller shutter doors will be installed to provide access for incoming trucks and facilitate loading/unloading operations

Internally, the individual areas are divided by concrete walls that also act as 'push' walls for loading recovered materials. These are typically 3m high and 0.3m thick reinforced concrete. Floors will be reinforced concrete with a minimum thickness of 0.2m approx. The loading area in the residual waste reception area is 2.5m below the finished floor level of the rest of the building to cater for loading of high sided ejector trailers used to transfer waste for further processing. This area is served by a ramp for access/egress. This area will be drained at the external/internal envelope interface which will discharge to surfacewater collection system. Internally the floors will be engineered for collection of periodic wash down water for discharge to foul water collection and treatment systems.

The building will have a 3-phase power requirement which will come into the building at a centralised point. From this point it will be distributed internally to the necessary areas. The building will be equipped with security and fire alarm systems.

Bale Storage Building

The Bale Storage Building will be a single storey construction with internal floor area of 978m^2 approximately. It will be subdivided internally by reinforced concrete walls used to support the stored bales. The building is open on one side which allows free access to fork lifts moving processed waste from the waste reception and process building. A 2.7m canopy will shield the open side of the building. Lorries moving the bales off site will be loaded within the building.

The structure will be based on a steel portal frame on reinforced concrete foundations. The external envelope will be formed using a single steel cladding panel. Opaque rooflights and side panels will be included to maximize the use of natural daylight. Steel roller shutter doors will be installed to provide access for incoming trucks and facilitate loading operations

Internally, the floor area will be divided by concrete walls that also act to stabilise bale stacking. These are typically 3.5m high and 0.3m thick reinforced concrete. Floors will be reinforced concrete with a minimum thickness of 0.2m approximately. The floor level will be above ground i.e. no sublevel access will be provided. Loading of trucks will be through the use of a mobile ramp.

The building will have a relatively low power requirement which will come into the building at a centralised point. From this point it will be distributed internally to the necessary areas. The building will be equipped with lighting and fire alarm systems.

D.1.n Site Accommodation

Administration Building

The Administration Building will be a two storey construction used to provide welfare facilities for the site operatives and an administration centre for the site operations. The first floor is provided within the roof area. The total floor area of the building will be 430m^2 on a footprint of 352m^2.

The building will be constructed in traditional style concrete block cavity walls with prefabricated timber roof trusses. The first floor will be formed using a concrete slab. Alternatively, the building will be a prefabricated building constructed in sections off site, supplied and erected on site by a specialist contractor. The building shall conform to the Building Regulations in all respects and will use energy saving technologies where appropriate.

Internally, the building will be subdivided using a block work or stud partition construction. Staircases will be constructed of concrete. Externally, the walls will be finished in smooth plaster weathering and/or faced with selected stonework. Security shutters will be fitted externally over doors and windows.

The building will require power which will come into the building at a centralised point. From this point it will be distributed internally to the necessary areas. The building will be equipped with security and fire alarm systems. The building will incorporate low voltage equipment where appropriate.

D.1.o Fire Control System

In facilities of this nature, fires are prevented by operating best practice including:

- Inspection of loads at the weighbridge
- Control of loads to ensure no burning or smouldering loads enter the facility
- Designation of smoking/non smoking areas
- Security
- Smoke detectors and fire alarm
- Fire extinguishers, hoses and hydrants
- Staff training

All buildings will be equipped with heat and smoke sensors so that in the event of a fire both the site management and emergency services can be quickly alerted. Portable fire fighting equipment will be located at various locations throughout the buildings and the rainwater harvesting tank and surface water attenuation tank will also act as back up fire-fighting water storage tanks.

The fire authority will be informed of the development prior to commencement of operations as part of the preparation of emergency procedures for the site in line with the requirements of the waste licence.

D.1.q Any other waste recovery infrastructure

There will be no other waste recovery infrastructure onsite in addition to that described in the previous sections.

D.1.s Construction & Demolition Infrastructure

The following outlines the main elements of the construction phase of the development. These are identified as:

- Site clearance and excavation of peat material
- Filling of site to proposed elevation with a suitable fill material (typically a granular material to approved specification)
- Installation of drainage networks and construction of attenuation pond
- Installation of site fencing/installing lamp standards for site lighting.
- Construction of building foundations for all buildings.
- Preparation of hardstanding and road sub bases.
- Filling of buildings sub base to underside of floor level.
- Erection of structural steelwork/blockwork for all buildings
- Cladding of buildings/roofing and plastering of Administration building
- Pouring of internal floors and subdividing walls and installation of road kerbs etc.
- Finishing of internal roads and hardstandings (concrete and asphalt)
- Installation of electrical/mechanical equipment and roller shutter doors
- Site clean up and commissioning.

It is estimated that the project will take 9 -12 months to complete. It is likely that a temporary construction site compound will be required for the duration of the project. It will consist of a hardcored area surrounded by secure fencing, comprising site office, canteen, toilet facilities, storeroom, and staff parking areas. Fuel/oil storage areas will be bunded in accordance with best practice.

Temporary toilet facilities will be required for construction workers. These will consist of temporary 'portaloo' type chemical toilets located throughout the site.

The contractor will prepare a Construction Environmental Management Plan. This plan will include, as a minimum, the means by which the contractor will address the control of potential emissions to air, ground and/or surface waters. In addition, the contractor will identify the means by which potential issues in relation to noise and traffic will be managed during the construction phase.

Attachment D.2 Facility Operation

The activities that occur at the materials recycling and waste transfer facility are listed as follows:

D.2.1 Waste acceptance
D.2.2 Unloading and inspection of waste
D.2.4 Materials recovery plant operation
D.2.5 Waste transfer area operation
D.2.6 Biowaste area operation
D.2.7 Transfer of materials offsite

The locations at which these activities occur and a flow diagram of site activities are indicated in Drawing LW09-660-04_300-007.

Emissions related to the activities listed above are limited to those from the use of excavators and forklifts. All other plant used in general facility operations is electrically operated.

D.2.1 Waste Acceptance & Handling

All waste accepted at the facility will be subject to waste acceptance measures which will be outlined in the facility's environmental management system (EMS). The likely waste acceptance procedures will involve the use of an integrated waste software system.

Only the operators own vehicles will be accepted at the site. When waste arrives on-site, it will be weighed at the weighbridge and the vehicle registration number and origin of the load entered into the software system. A weight docket will be printed for each waste load. The waste vehicle will then be directed to the appropriate area of the Waste Reception and Processing building. The Waste Reception and Processing Building will be divided into three sections:

- Materials recovery area
- Waste Transfer area
- Biowaste area

Materials Recovery Area

Mixed dry recyclable (MDR) waste material will be deposited in the incoming material deposit bunker and visually inspected. Material will be loaded into a metering hopper that feeds the material recovery plant using a loading shovel. Through a system of conveyors, picking stations, screens, magnetic and eddy current separators, optical separators and other plant, the waste material will be separated into its various fractions such as mixed papers, cardboard, plastics and ferrous and non-ferrous metals. The final configuration of the materials recycling plant will be determined based on, among other factors, market considerations and the characteristics of the accepted waste material.

Once segregated into the different fractions, the recyclable material will be baled with the bales of material being transported for storage to the Bale Storage Building using a forklift. When determined by the operations manager and based on market conditions, the baled material will be loaded into trailers and transported off site for sale on the recyclables market.

Waste Transfer Area

Material accepted at the facility for bulking up will be unloaded in the waste reception area of the waste transfer section of the building and inspected. The material will then be placed in an appropriate bunker using a loading shovel until such time as a sufficient quantity of the material is received. These bunkers are likely to be constructed using moveable, precast concrete walls or blocks of the Alfabloc variety. Waste materials to be accepted in the waste transfer section will be construction and demolition (C&D) waste, 'black bag' residual waste and certain commercial and industrial (C&I) waste materials.

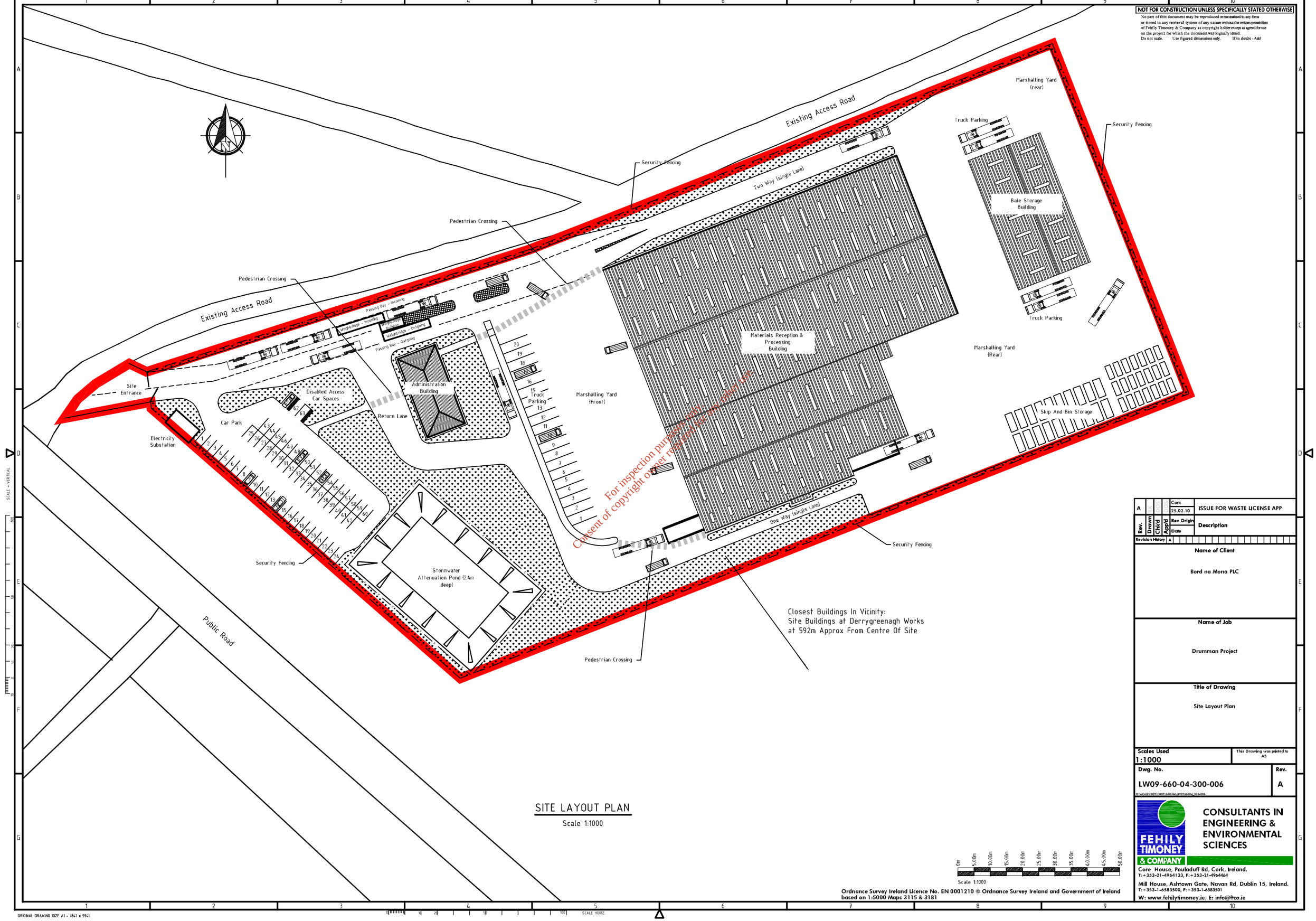
Once a sufficient quantity of a waste type is accumulated, this waste material will be loaded into high sided trailers in the loading pit in the waste transfer building. The lower level of the loading pit allows the loading shovel operator to accurately and cleanly load the trailer prior to the transportation of this material offsite for further treatment or disposal.

Biowaste Area

It is generally 'brown bin' biowaste material that will be accepted in this section of the building, typically from refuse collection vehicles that have collected organic waste from household and commercial premises. Vehicles will access the building through rapid opening and closing doors. This material will be deposited on the floor of the building and inspected for contamination. If it is expected that the material will have a high moisture content then material such as wood chip or paper/card will be laid on the floor in order to prevent spillage and difficulties in handling.

The biowaste material will be stockpiled within the building and when a sufficient volume has accumulated, will be loaded into a low sided trailer for transportation to a designated biological treatment facility.

In all sections of the facility, waste deemed unacceptable for acceptance at the facility will be moved to the designated waste quarantine areas and loaded into designated compactor bins, prior to its removal off site and transfer to an appropriate facility for disposal or recovery.



SITE LAYOUT PLAN

Scale 1:1000

0m 5.00m 10.00m 15.00m 20.00m 25.00m 30.00m 35.00m 40.00m 45.00m 50.00m

Scale 1:1000

Rev.	Drawn	Chkd	Appd	Date	Description
A				Cork 25.02.10	ISSUE FOR WASTE LICENSE APP

Revision History: A

Name of Client

Bord na Mona PLC

Name of Job

Drumman Project

Title of Drawing

Site Layout Plan

Scales Used 1:1000

This Drawing was printed to A3

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ORIGINAL DRAWING SIZE A1 - (841 x 594)

SCALE HORIZ.

SCALE - VERTICAL

All Waste Material
Mixed Dry Recyclables
C+I/C+D
Biowaste

All Material Entering/Leaving Facility Passes Over Weighbridge

Security Fencing
Pedestrian Crossing
Pedestrian Crossing
Two Way (single Lane)
Passing Bay - Incoming
Weighbridge - Incoming
Weighbridge - Outgoing
Passing Bay - Outgoing
Site Entrance
Disabled Access Car Spaces
Administration Building
Return Lane
Car Park
Electricity Substation
Truck Parking
Marshalling Yard (Front)
Marshalling Yard (rear)
Truck Parking
Security Fencing
Outgoing - Recyclable Materials Baling Area
Storage Building
Process - Recyclable Materials Sorting & Separation Area
Incoming - Recyclable Materials Reception Area
Materials Reception & Processing Building
Truck Parking
Marshalling Yard (Rear)
Biowaste Storage
Incoming - Biowaste Reception Area
C & D Storage
Skip And Bin Storage
Outgoing - Biowaste Truck Loading Area
Residual Waste Storage
Incoming - Waste Reception Area
Residual Waste Storage
Outgoing Ramp
Outgoing - Sub Ground Level Truck Loading Area
Incoming Ramp
One Way (single lane)
Security Fencing
Security Fencing
Stormwater Attenuation Pond (2.4m deep)
Pedestrian Crossing

INFRASTRUCTURE & PROCESS FLOW PLAN

Scale 1:1000

Rev.	Drawn	Chk'd	Appd		
A				Cork 25.02.10	ISSUE FOR WASTE LICENSE APP
				Rev Origin Date	Description
Revision History	A				

Name of Client

Bord na Mona PLC

Name of Job

Drumman Project

Title of Drawing

Infrastructure & Process Flow

Scales Used 1:1000

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Dwg. No. LW09-660-04-300-007

Rev. A

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ORIGINAL DRAWING SIZE A1 - (841 x 594)

See Partial Site Layout Plan For
Continuation Of Drainage
Network To Discharge Point

Overflow Discharge From Permeable Paving
Stormwater Attenuation Pond Discharge Pipe
Treated Foul Discharge Pipe to Mongagh River
Pedestrian Crossing
Existing Access Road
Security Fencing
Two Way (single Lane)
Marshalling Yard (rear)
Truck Parking
Bale Storage Building
Materials Reception & Processing Building
Marshalling Yard (Front)
Marshalling Yard (Rear)
Skip And Bin Storage
One Way (single Lane)
Site Entrance
Passing Bay - Incoming
Weighbridge - Incoming
Weighbridge - Outgoing
Passing Bay - Outgoing
Administration Building
Disabled Access Car Spaces
Car Park
Return Lane
Truck Parking
Electricity Substation
Permeable Paving
Stormwater Attenuation Pond (2.4m deep)
Foul And Leachate Treatment System
Oil/Water Separator
Mongagh River
Public Road
Discharge To Mongagh River

SITE LAYOUT PLAN
Scale 1:1000

PARTIAL SITE LAYOUT PLAN
Scale 1:1000

LEGEND
Surface Water From Roads And Hardstandings
Surface Water From Building Roofs
Surface Water From Permeable Paving
Foul And Leachate Collection And Treatment

0m 5.00m 10.00m 15.00m 20.00m 25.00m 30.00m 35.00m 40.00m 45.00m 50.00m
Scale 1:1000

Rev.	Drawn	Chk'd	Appr'd	Date	Description
A				Cork 25.02.10	ISSUE FOR WASTE LICENSE APP
Revision History	A				

Name of Client
Bord na Mona PLC

Name of Job
Drumman Project

Title of Drawing
Site Services Plan - Proposed

Scales Used: 1:1000
This Drawing was printed to A3

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ORIGINAL DRAWING SIZE A1 - (841 x 594)
SCALE HORIZ.
SCALE - VERTICAL

ENVIRONMENTAL BALANCE IN DESIGN AND CONSTRUCTION

BORD NA MÓNA PLC

ENGINEERING SERVICES REPORT FOR THE PROPOSED MATERIALS RECYCLING & WASTE TRANSFER FACILITY AT DRUMMAN, CO. OFFALY

FEBRUARY 2010

BORD NA MÓNA PLC

FEHILY TIMONEY & COMPANY

BORD NA MÓNA PLC

ENGINEERING SERVICES REPORT FOR THE PROPOSED MATERIALS RECYCLING & WASTE TRANSFER FACILITY AT DRUMMAN, CO. OFFALY

User is Responsible for Checking the Revision Status of this Document

Rev. Nr.	Description of Changes	Prepared by:	Checked by:	Approved by:	Date:
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Client: Bord na Móna PLC

Keywords: services, existing, proposed

Abstract: The report identifies the existing site services at the location of the proposed Bord na Móna materials recycling & waste transfer station at Drumman, Co. Offaly. This report accompanies the application for planning permission for this proposed development to Offaly County Council.

TABLE OF CONTENTS

LIST OF FIGURES

1. INTRODUCTION

The report purports to identify the existing site services at the location of the proposed Bord na Móna materials recycling & waste transfer station at Drumman, Co. Offaly. In addition, services proposed as part of the infrastructural development of the site are identified and discussed. Consideration is also given to fire design considerations for the proposed facility.

This report is intended to accompany the application for planning permission for this proposed development to Offaly County Council.

1.1 Site Description

Bord na Móna PLC proposes the development of a materials recycling & waste transfer facility of 99,000 tonnes per annum capacity to satisfy infrastructural requirements of its waste management company, AES Ireland Ltd. AES Ireland Ltd. operates extensively in the midland region, as well as in the wider Leinster area and southern and eastern areas of Connacht and the north Munster region.

It is proposed that the facility be developed at Drumman, Co. Offaly, approximately 1.75 kilometres south west of Junction 3 of the M6 on the R400 Rochfortbridge – Rhode road. The site is adjacent to Derrygreenagh Works from which peat milling activities on the surrounding Derrygreenagh group of bogs are managed. The Derrygreenagh Works site is currently subject to a separate planning application to An Bord Pleanala for the development of a gas fired power plant.

An area of approximately 21 ha. has been selected for the siting of the proposed development and it is expected that the facility will occupy a footprint of 3.2 hectares within the wider 21 ha. The selected footprint for the siting of the facility is shown in Figure 1.1.

Derryarkin Sand and Gravel Ltd. is located approximately 500 metres to the south west of the site while a commercial piggery is located approximately 2 kilometres to the south of the site. Two residential dwellings are located 1.5 kilometres to the north west of the site with two further dwellings located 1.5 kilometres to the south east.

The proposed facility at Drumman will processes 50,000 tonnes per annum of mixed dry recyclable (MDR) waste material and will 'bulk up' 49,000 tonnes of construction and demolition waste (C&D), commercial and industrial waste (C&I) and mixed residual ('black bag') and brown bin organic waste.

The site is located within an area of cutaway bog which is part of the Derrygreenagh Group of bogs. Extraction of peat is no longer feasible at the proposed location due to the exhaustion of the peat resource at this location. The topography of the site is generally flat and scrubland has developed in some portions of the site since the cessation of peat extraction.

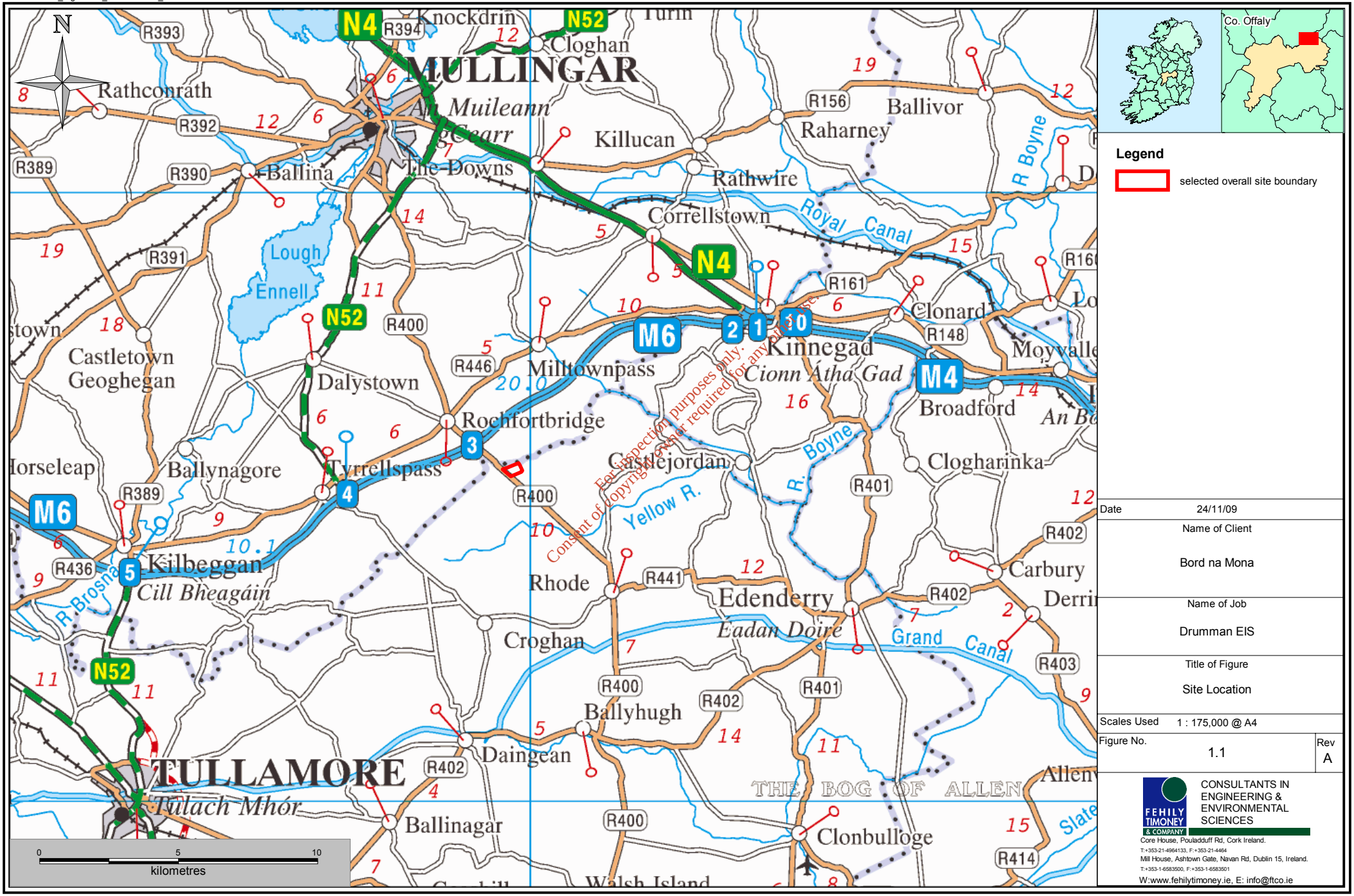
1.2 Existing Site Services

Given the nature and location of the site, existing services at the site are limited and are summarised as follows.

1.2.1 Electricity supply

A medium voltage (10/20 kV MV) overhead ESB line runs along the southern edge of the R400 road directly opposite the southern perimeter of the Drumman site. Directly opposite the site entrance, this line crosses the road (overhead) to a transformer pole located directly adjacent to the entrance, as shown in Figure 1.2.

From this location the line then runs as 3 phase/single phase power to the existing weighbridge, located approximately 100 metres from the entrance.



Date	24/11/09
Name of Client	Bord na Mona
Name of Job	Drumman EIS
Title of Figure	Site Location
Scales Used	1 : 175,000 @ A4
Figure No.	1.1
Rev	A

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Figure 1-2: MV line to site

1.2.2 Telecoms

An existing overhead eircom line runs along the northern edge of the R400 road. It is envisaged that this line can be used to service the site when operational.

1.2.3 Gas

There is no existing gas main in the vicinity of the proposed site. However, should the proposed gas fired power plant development at the adjacent Derrygreenagh site proceed, there is potential for the expansion of gas infrastructure in the immediate area.

1.2.4 Water Supply

Public mains run to a location approximately 1.5 km from the proposed site.

1.2.5 Foul Water/Sewer

There is no existing sewer in the locality.

1.2.6 Surface Water Management

Given that the site is situated in a cutaway bog location, the site is drained by a network of open drainage channels that were installed during the peat harvesting process. Since peat extraction ceased, these drainage channels have not been actively managed and they currently provide limited (if any) effectiveness in the draining of the site at present.

1.2.7 Access

Access to the site is via the R400 regional road approximately 1.5 km south east of Junction 3 of the M6 motorway. An existing gated entrance (evident in Figure 1-2) provides access to the site and a gravel based haul road extends parallel to the site location and follows the course of the Mongagh River in a north easterly direction further into the network of the Derrygreenagh group of bogs.

A weighbridge is currently installed approximately 50 metres north of the existing entrance. It is not envisaged that this weighbridge will be utilised as part of operations at the proposed facility.

The main aspects of the proposed development will consist of:

- Dual weighbridge system with weighbridge office
- Accommodation building comprising offices and welfare facilities
- Visitor and Staff carparking

- Waste Reception and Processing Building (incorporating loading pit)
- Bale Storage Building
- Marshalling yards (front and rear of Processing Building)
- Trailer parking
- Skip / roll-off bin storage area
- Surface water attenuation lagoon
- Ancillary infrastructure (substation, wastewater treatment plant, telecoms

2. PROPOSED SITE SERVICES

As part of the proposed development, the following site services will be installed. Drawing LW09-660-04_200-002 identifies the proposed site layout, with services elements indicated.

2.1 Electricity Supply

It is envisaged that the existing electricity supply can be utilised to provide sufficient supply to the proposed development. An ESB substation will be located within the perimeter of the site from which supply to the waste reception and processing building, administration building, weighbridge cabin, bale storage building and other ancillary infrastructure (wastewater treatment plant, site lighting, security cameras etc) will be linked via underground distribution cables from the substation.

Further consultation with the ESB will be undertaken during the detailed design phase in terms of the capacity required at the facility. An indicative ESB substation design is presented in Drawing LW09-660-04_100-007.

2.2 Telecoms

Telecoms supply to the site will be via the existing eircom line that can be extended into the site and towards the administration building. A phone line and broadband supply will be required at the site. The eircom national broadband map (http://www.broadbandatoz.ie/your-area.asp?id=24) indicates that broadband is available in both the Rochfortbridge and Rhode exchanges which will allow the facility operator interact with the servers and systems of their head office.

2.3 Gas

In the event of development of the gas fired power plant at the adjacent site, a gas supply may become available in the locality. However, it is not envisaged that a gas supply will be required at the proposed development.

2.4 Water Supply

The hydrogeological assessment of the proposed site carried out as part of the preparation of the environmental impact statement for the proposed development indicated that the site is located in an area where the local aquifers can be considered locally important and moderately productive in local zones. To this end, it is proposed that a bored groundwater supply be utilised at the site as a water supply.

In addition, it is proposed that rainwater harvesting be utilised at the facility for greywater applications i.e. washdown, toilet flushing etc to augment the bored supply. An indicative rainwater harvesting system is presented in Appendix 1.

2.5 Foul Water

It is proposed that foul water be treated onsite with the effluent disposed of to the Mongagh River.

The wastewater will be treated on site in a proprietary wastewater treatment plant (Puraflo or similar) and discharged to the Mongagh River. It is proposed that the effluent receive secondary treatment to a standard of 20:30 (BOD mg/l: Suspended Solids mg/l) as per 'BS6297 The Code of Practice for the Design and Installation of Small Sewage Treatment Works and Cesspools'.

Detail of the Bord na Móna Puraflo wastewater treatment system is included in Appendix 2 for information.

The individual areas of the waste reception and processing building i.e. the materials recycling area, the waste transfer area and the biowaste area will be washed down at different intervals depending on the level of contamination of the waste being sorted within the areas.

See Partial Site Layout Plan For Continuation Of Drainage Network To Discharge Point

Overflow Discharge From Permeable Paving

Stormwater Attenuation Pond Discharge Pipe

Treated Foul Discharge Pipe to Mongagh River

Existing Access Road

Security Fencing

Pedestrian Crossing

Two Way (single Lane)

Marshalling Yard (rear)

Truck Parking

Bale Storage Building

Materials Reception & Processing Building

Marshalling Yard (Front)

Marshalling Yard (Rear)

Skip And Bin Storage

Passing Bay - Incoming

Weighbridge - Incoming

Weighbridge Building

Weighbridge - Outgoing

Passing Bay - Outgoing

Site Entrance

Disabled Access Car Spaces

Car Park

Return Lane

Administration Building

Truck Parking

Electricity Substation

Permeable Paving

Stormwater Attenuation Pond (2.4m deep)

One Way (single Lane)

Foul And Leachate Treatment System

Oil/Water Separator

Mongagh River

Public Road

Discharge To Mongagh River

PARTIAL SITE LAYOUT PLAN

Scale 1:500

LEGEND

Surface Water From Roads And Hardstandings

Surface Water From Building Roofs

Surface Water From Permeable Paving

Foul And Leachate Collection And Treatment

0m 5.00m 10.00m 15.00m 20.00m 25.00m 30.00m 35.00m 40.00m 45.00m 50.00m

Scale 1:500

Rev.	Drawn	Chk'd	App'd		
A	MC	DOS	DOS	Cork 25.02.10	ISSUE FOR PLANNING PERMISSION
				Rev Origin / Date	Description

Revision History: A

Name of Client

Bord na Mona PLC

Name of Job

Drumman Project

Title of Drawing

Site Services Plan - Proposed

Scales Used	This Drawing was printed to
1:500	A1-Landscape

Dwg. No.	Rev.
LW09-660-04-200-002	A

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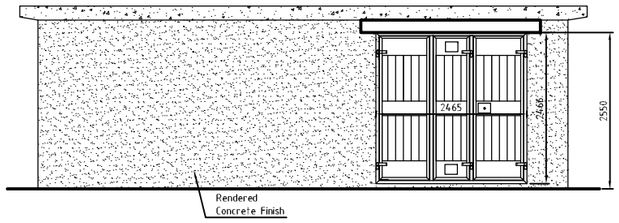
ORIGINAL DRAWING SIZE A1 - (841 x 594)

SCALE - VERTICAL

SCALE HORIZ.



WEST ELEVATION

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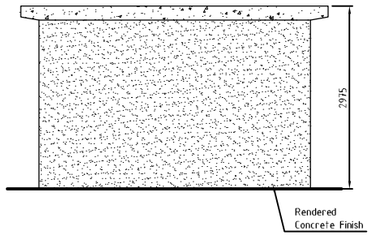

NORTH ELEVATION

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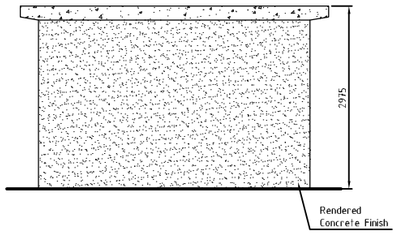

SOUTH ELEVATION

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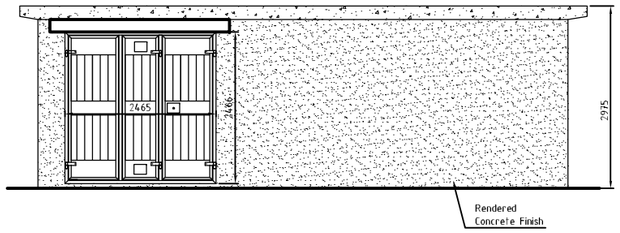

EAST ELEVATION

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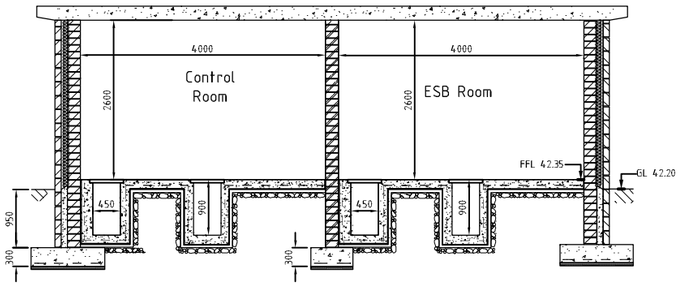
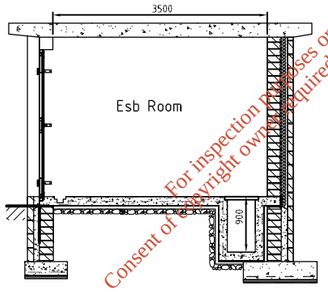


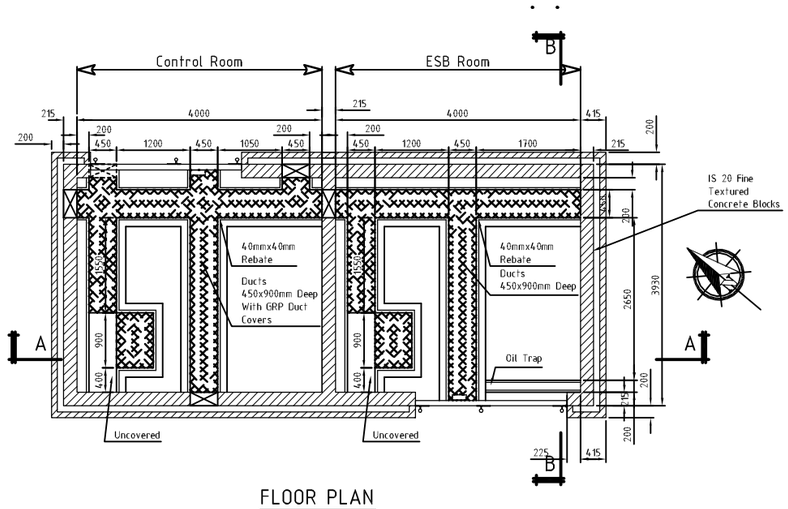
SECTION A-A

Scale 1:100



SECTION B-B

Scale 1:100



FLOOR PLAN

Scale 1:100

Rev.	Drawn	Chk'd	Appr'd		
A				Cork 25.02.10	ISSUE FOR PLANNING PERMISSION
Revision History	A			Rev Origin / Date	Description

Name of Client

Bord na Mona PLC

Name of Job

Drumman Project

Title of Drawing

Electricity Substation Building
Elevations, Floor Plan & Sections

Scales Used	This Drawing was printed to
1:100	A3

Dwg. No.	Rev.
LW09-660-04-100-007	A

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For the purposes of sizing the onsite wastewater treatment plant, the maximum flow from the building will occur when all three areas are washed down on the same day. It is assumed that it will take approximately 2 hours to wash down the building with a standard hose with a flow rate of 1 l/s. The maximum flow to the onsite wastewater treatment plant and subsequently discharging to the Mongagh River is therefore estimated as 9,000 l/day.

It is considered that this will be the exception rather than the norm as, in practice, the material recycling area will be a dry environment with relatively clean materials being processed, therefore the requirement for washdown will be minimal. More regular washdown may be required with the waste transfer area while regular washdown will be required within the biowaste area of the building.

Internal floors will drain to gulleys which will flow to the wastewater treatment unit. Effluent from the wastewater treatment plant will be piped to the Mongagh River for discharge.

Pipeline specifications will be determined during the detailed design phase of the development.

2.6 Surface Water Management

Surface water management onsite will be provided by a surface water lagoon to attenuate flows generated from impermeable surfaces onsite.

The management of surface water management at the proposed facility is informed by a flood risk assessment carried out as part of the environmental impact assessment. Management of surface waters will be provided through attenuation of the surface water run-off from the site. The surface water management system will be designed to reduce the potential impacts of the proposed development on the receiving environment.

It is proposed to install an attenuation pond as a first element of construction of the proposed development. The attenuation pond will provide for the full attenuation of a 1 in 100 year event at the site in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) guidelines.

During consultation with Offaly County Council as part of the environmental impact assessment, it was recommended that permeable paving be considered in the design of the surface water system on site. This would allow for some recharge into the groundwater on site. The most suitable area to provide permeable paving is the staff car park. The potential for infiltration at this location will be examined at detail design stage using the recommended method in BRE 365. If infiltration tests prove to be inadequate at this location, then gullies will be provided in the staff car park and the drainage connected into the main drainage system as shown in the drainage layout.

The roof water from the Administration Building and the Waste Reception and Processing Building will be connected into the drainage system as shown on the layout drawing. Rainwater harvesting is also proposed for the materials reception and processing Building. The design of the rainwater harvesting system will be confirmed during detailed design. In any event, the surface water drainage pipework will be designed to take the full flow from the roofs of all buildings.

The access roads, the truck parking areas and the marshalling areas will all pass via hydrocarbon interceptors and silt traps before discharging to the attenuation pond.

The ERFB will be consulted prior to the construction of the discharge pipe from the attenuation pond. The discharge pipe will be laid in accordance with the ERFB guidance document ‘Protection of Fisheries Habitat during Construction and Development Works at River Sites’.

The attenuation pond will be fenced off with lockable gates and warning signs and lifebuoys provided. The design of the surface water management infrastructure is presented in Drawings LW09-660-04_200-002.

2.7 Access

It is envisaged that the existing entrance will continue to be utilised for the proposed development. A dedicated haul road for accessing the proposed facility will be constructed and will tie in with the existing road that provides access to the sand extraction activities located to the north of the proposed site. Vehicles with utilise the existing haul road for approximately 100 m before passing onto the dedicated facility haul

road and through a second gated entrance into the facility. Appropriate signage will direct employees and visitors to the designated car parking areas and waste vehicles to the weighbridge.

The site will be finished with a hardstanding area that consists of a 200 mm reinforced steel concrete slab laid on top of a 2000 gauge visqueen membrane on top of a minimum of 300 mm of hardcore laid in 150 mm layers. Internal Roads will have an asphalt finish. Internal traffic on the hardstanding areas will be directed along marked portions. There will be 63 no. parking spaces for visitors and staff.

Access for emergency vehicles has been considered, refer to Item No. 13 in Table 3-1.

3. FIRE DESIGN CONSIDERATIONS

As part of the preliminary design process, Fehily Timoney & Company (FTC) engaged in preliminary discussion with Bord na Móna's insurance brokers, AON, in terms of their requirements for consideration as part of the design of the proposed facility.

AON provided guidance in the form of a 'New Projects' document which outlined the areas for consideration during design. It should be noted that a number of the issues identified will relate specifically to the detailed design phase but the following table indicates the consideration given to the issues raised at this juncture.

Item No	Item Description	FTC Preliminary Design Response
1	**Separation:** Ideally all new buildings should be separated from each other and existing buildings by a minimum of 10m. Different risk occupancies – storage, production, facilities, etc should ideally be located in separate buildings. Surrounding occupancies and degree of hazard within those occupancies must be taken into consideration.	Buildings are separated by min 20m in preliminary design drawings. Buildings with a primary use as storage are self contained.
2	**Compartmentation**	
a	Where the above separation cannot be achieved, four-hour fire compartmentation should be provided between each functional unit. Four-hour firewalls comprise 215mm solid concrete blocks, which extend 1m through the roof by 1m and return 3m at each end to ensure a fire may not jump over or around the wall.	Preliminary compartmentation achieved by building separation. Further internal separation to be reviewed at detail design stage
b	All steelwork in the wall should also be protected to four hours normally by 50mm cover of concrete. All steelwork connected to the fire wall should be treated with intumescent materials.	Acknowledged, this will be incorporated in detail design specifications where relevant
c	In the event of structural roof steelwork failing and collapsing during a fire, this steelwork should not cause a firewall to fail because of loading at wall (or column) interface.	Acknowledged, this will be incorporated in detail design constraints where relevant
d	All openings and services passing through firewalls should be protected by approved materials/devices (LPC or FM) to the same fire resistance as the wall. Reference should be made to the LPC (Loss Prevention Council) Design Guide for the Fire Protection of Buildings 2000 for guidance on compartment size.	Acknowledged, this will be incorporated in detail design specifications where relevant
e	Expanding foams (including "fire resistant foams") provide very limited protection and should not be used except possibly for holes less than 15mm dia. through concrete walls. Guidelines in the data sheet for the product should be followed in all cases.	Acknowledged, this will be incorporated in detail design constraints where relevant
f	The fire resistance of compartment walls may be reduced if the building is sprinkler protected.	Acknowledged, this will be incorporated in detail design constraints. Sprinkler systems and their provision will be subject to fire risk assessment of the building operations
3	**Construction Materials**	
a	All materials of construction should be non-combustible or suitably fire rated in terms of integrity and insulation. Brick and concrete block is acceptable.	Acknowledged, this will be incorporated in detail design specifications.

b	In relation to composite panels, at the moment most insurers will accept LPCB approved composite panel systems installed to LPS1181 approved grade A or better (preferably mineral fibre / rockwool insulation cores, or PIR for freezer storage). While such LPCB approved PIR insulation is at present tolerable to insurers, this situation may change in accordance with insurer claims experience. For this reason we would strongly urge that wherever possible, non foam plastic cores should be used. PUR (polyurethane), EPS / XPS (polystyrene / aeroboard / styrofoam) and other combustible insulation should not be used including in panels because these materials burn readily and can be difficult to insure.	Acknowledged, this will be incorporated in detail design constraints.
c	Comprehensive Panel Management programmes will need to be implemented and maintained where such panel systems are used. These will include: Providing ducting to all electrical services passing through the panels No electrical appliances, devices or apparatus should be mounted on or in close proximity to wall or roof panels incorporating a combustible / foam core. All heat producing appliance flues passing through panels must have combustible insulation removed for 1m around the flue / duct. Panels must be sealed with metal sheeting on all six sides Panels should be regularly inspected and any damage repaired by metal plating. No hot work should be carried out on the panels – they must only be cold cut with a reciprocation saw Only incombustible insulated panels (e.g. rockwool / glass fibre) should be used in cooking or heating areas. Details of LPC Approved Construction Materials together with their Fire Rating may be viewed at the following address http://www.brecertification.co.uk/searchredbooklive.jsp	Acknowledged, this will be incorporated in detail design constraints and O&M documentation
d	Note that wall & roof panel installation should also be in accordance with LPC or FM guidelines including with respect to joining of panels with mechanical fixings (e.g. screws, rivets) and regarding protection of exposed insulation materials at panel ends. Installation work should be done by an approved contractor.	Acknowledged, this will be incorporated in detail design specifications.
4	**Sprinkler Protection**	
a	Automatic sprinkler protection complying with LPC rules (incorporating BS5306 part 2 / BS EN 12845) or NFPA 13 Standards should be provided throughout the premises, with particular reference to appropriate design for storage heights and methods. Consider possible future change of use when deciding on the sprinkler design specification.	Acknowledged, this will be considered at detail design stage.
b	Installation of life safety spec. sprinklers may allow the safe travel distances to fire exits to be increased beyond those permitted by Building Regulations / Codes (sometimes as much as doubled – requires agreement of the local authority fire officers). This can allow for more efficient use of space and reduced number of stairs / corridors.	Acknowledged, this will be considered at detail design stage.
5	**Automatic Fire Detection**	
a	Automatic fire detection in accordance with NFPA 72, LPC, BS 5839 Pt 1, IS3218, EN, DIN or local standards should be installed through out the building. This should be to the highest life safety standard (e.g. L1) as this normally exceeds property protection requirements. The system should be monitored at a 24 hour manned location or alternatively off site.	Acknowledged, this will be considered at detail design stage.

6	**Fire Extinguishers / Fire Hose Reels**	
a	Extinguishers and fire hose reels should be provided in accordance with IS 291, BS 5306, NFPA, LPC, EN, DIN or local standards. Fire extinguishers should be located at or near exits. Note that some fire authorities no longer recommend installation of fire hose reels except for industrial occupancies where personnel are trained in their use.	Acknowledged, this will be considered at detail design stage.
b	If fire hose reels are installed, the water supply (including any electric pumps) must be reliable.	Acknowledged, this will be considered at detail design stage.
7	**Fire Hydrants**	
a	A minimum 150mm ring main should be provided at the site fed by a separate towns main. Hydrants should be installed at least every 75m, and should be identified by adequate signage. Installation should be in accordance with BS5306 Part 1 with a minimum flow of 1500 litres per minute, and should also comply with local Building Regulations or Fire Code.	Acknowledged, this will be considered at detail design stage.
b	If hydrants cannot be made available, an alternative stored source of fire fighting water should be provided. This should include appropriate fire brigade connection.	Acknowledged, this will be considered at detail design stage.
c	Where pillar fire hydrants (e.g. US style) are used, these should be installed strictly in accordance with makers instructions in order to ensure full drain down when the valve is closed.	Acknowledged, this will be considered at detail design stage.
8	**Suppression Systems**	
a	Depending on exposure, contingency and backup arrangements, automatic gas suppression should be provided for critical computer equipment following a risk assessment. Where the building is to be sprinkler protected, the sprinkler rules should be referred to.	Acknowledged, this will be considered at detail design stage.
b	Automatic fire extinguishing / suppression systems should be provided to protect cooking appliances, especially deep fat fryers and possibly ovens, following a risk assessment. LPC/NFPA Codes to be followed as appropriate. Fryers and stoves in commercial kitchens should be protected by UL300 / NFPA96 (or equivalent) compliant fire suppression systems. This equipment should isolate cooking fuel / power in the event of activation, and should signal the fire alarm.	N/A
c	Kitchens should be fitted with emergency shutdown (ESD) buttons at exit doors. These ESD buttons should isolate gas and all non essential electric power. The manual release for the kitchen fire suppression system should also be located at the exit door.	N/A
d	Kitchen air extract systems / ductwork should be routed away from combustible building components, and should be fitted with cleaning / inspection hatches.	N/A
e	Further more detailed information on commercial kitchen design is available on request.	N/A
9	**Intruder Alarm**	
a	An intruder alarm system should be installed in accordance with recognised standards BS EN 50131 or local codes and local ACPO policy). The system should be monitored off site. Note that double knock / verification is required on new systems.	Acknowledged, this will be considered at detail design stage.

10	**Security**	
a	Adequate security measures should be provided given the attractiveness of the stock and exposure. Minimum standards should include good physical security, 24 hour security guarding supported by a comprehensive CCTV system with digital recording, good quality perimeter fencing, access control to the site and sensitive areas of the building, intruder alarm as above.	Acknowledged, this will be considered at detail design stage.
b	Where site contents / stock are particularly valuable and vulnerable to theft, consideration should be given to mirroring CCTV over broadband at another secure remote site.	Acknowledged, this will be considered at detail design stage.
c	Where turnstiles, security gates and automatic barriers are present, rapid escape in case of fire should be taken into consideration.	Acknowledged, this will be considered at detail design stage.
11	**Gas Leak Detection**	
a	Gas leakage detection should be provided in all areas where flammable (or poisonous / suffocating) gas is used and could accumulate should a leak occur. This includes boiler rooms, plant rooms and kitchens. Activation of the detection system should cause an isolation of the mains gas supply and sound an alarm. Where appropriate manual reset "slam valves" should be installed to isolate gas and/or electrical supply in an emergency.	N/A
b	In kitchens and in environments where gas leak sensors would be susceptible to early contamination, use of a gas proving system instead of gas leak detection equipment would be acceptable to (and possibly preferred by) most insurers.	N/A
c	Where ammonia refrigeration plant is present, gas detection should be installed to raise alarms and isolate the plant.	N/A
12	**Heating/Cooling**	
a	Ideally all heating appliances should be contained in either separate (by distance) or fire separated concrete constructed compartments. The boilers or heating units should provide indirect heat by means of transferring steam, hot water, etc to heat transfer units in production or storage areas as necessary.	Acknowledged, this will be considered at detail design stage.
b	Automatic fuel shut down devices should be incorporated including fusible links (or similar operated) oil supply line fire shut off valves, flame failure, low-pressure etc. Domestic fire valves should not be used.	Acknowledged, this will be considered at detail design stage.
c	Portable heating appliances should not be used. These are a frequent cause of fires	Acknowledged, this will be considered in O&M documentation
13	**Emergency Services Access**	
a	Adequate provision must be provided for access by emergency vehicles (fire brigade, ambulance and police). Fire Brigade access requirements are covered in Building Regulations and / or Fire Codes.	Acknowledged, adequate access has been incorporated in preliminary design layouts i.e. hardstandings turning areas etc. This will be further considered at detail design stage.
14	**Yard Layout**	
a	The surrounding yards should be designed to take into account appropriate locations for the storage of combustible goods such as waste skips, wooden pallets, plastic trays etc. A distance of at least 15m should be allowed between such storage and any building or critical facility.	Acknowledged, dedicated storage areas have been incorporated in preliminary design layouts i.e. skip storage areas etc. This will be further considered at detail design stage.

15	**Gas Cylinder Storage**	
a	Adequate provision should be made for the safe storage of gas tanks and cylinders. This should include external compounds and cages, adequate bottle support, segregation of types of gas and full/empty bottles. Such storage should be adequately spaced from buildings and critical facilities (see above). Bulk LPG tanks should ideally be located on lower ground than buildings and in a location that would allow safe gas / liquid LPG dispersal should a leak occur. Note that LPG may "spread" via badly designed drains and underground ducts.	N/A
16	**Flammable Liquids/Chemicals Storage**	
a	Adequate provision should be made for the safe storage of flammable and highly flammable liquids and chemicals. This should include external bulk stores adequately spaced from buildings and critical facilities or, where this is not possible, a purpose built flammable liquids store, which is separated from the factory by means of a 240-minute fire resistant wall. Internal small working supplies can be stored in purpose built flammable liquids storage cabinets or bins.	Acknowledged, this will be considered at detail design stage.
b	The provisions of the LPC Recommendations for the Safe Use and Storage of Flammable Liquids should be followed. NFPA Code 30. may also be used. Some of the above notes re bulk LPG may also apply.	Acknowledged, this will be considered at detail design and operational stages
c	Oxidising agents should be segregated from all other flammable, highly flammable or combustible liquids.	Acknowledged, this will be considered at detail design and operational stages
17	**Battery Charging**	
a	Ideally battery charging facilities (e.g. for fork trucks) should be located in a two hour fire rated room. Adequate ventilation, mechanical handling equipment and safety arrangements (safety shower) should be provided.	Acknowledged, this will be considered at detail design and operational stages
18	**Plant Layout**	
a	When designing plant, the layout should take into consideration the proximity of combustible goods and combustible elements of construction. Hazardous plant may need to be segregated from the rest of the factory by means of a fire resisting wall which should achieve a minimum fire resistance of 60 minutes.	Acknowledged, this will be considered at detail design stage.
b	Use of plastic /combustible conveyor belts should be avoided. Otherwise, the need for automatic fire emergency shutdowns, interlocks, and suppression should be considered.	Acknowledged, this will be considered at detail design stage.
19	**Dust Explosions**	
a	The potential for dust explosions should be taken into consideration (e.g. in flour silos). A risk Assessment under ATEX / DSEAR (Dangerous Substances and Explosive Atmosphere Regulations) should be conducted. NFPA Codes 61 and 68 are useful reference documents.	Acknowledged, this will be considered at detail design stage.
20	**Surge/Transient Protection**	
a	Where critical data processing and communications equipment are present, adequate surge and transient protection should be included.	Acknowledged, this will be considered at detail design stage.

21	**Lightning Protection**	
a	Lightning protection should be provided to the building in accordance with BS6651, BS EN 62305, or other local code. Electrical feeds to the site and data communication lines should also be protected against lightning strikes.	Acknowledged, this will be considered at detail design stage.
22	**Standby Generators**	
a	For critical electrical supply, the provision of back up generators or generator coupling should be considered.	Acknowledged, this will be considered at detail design stage.
23	**Emergency Lighting**	
a	Emergency lighting should be installed in accordance with IS 3217 or equivalent, and procedures for test, inspection, review (including darkness testing).	Acknowledged, this will be considered at detail design stage.
24	**Flood & Water Damage Prevention**	
a	Roof drainage should be designed to cope with extreme rain conditions. Use of 100 year return data over 60 minutes is suggested. Where roofs are surrounded by parapets, consider the need for scuppers or other secondary roof drainage to cope with rainstorms and / or blocked roof drains that may cause water damage and potentially structural overloading.	Acknowledged, this will be considered at detail design stage.
b	The ground at the site should fall away from buildings. Avoid locating buildings at low points on a site. Critical equipment should not be located in a place likely to flood. This includes major electrical equipment and plant (incl generator and large UPS), communications equipment, and servers.	Acknowledged, site levels are to be raised in general with location of buildings as a priority in terms of flood risk, this will be considered further at detail design stage.
25	**Smoke Venting**	
a	Smoke venting should be considered. Ideally this should be manually operated, but if automatic care needs to be taken in their actuation where sprinkler protection is installed (open roof vents may delay sprinkler operation). Advice should be sought from insurance brokers / insurance company.	Acknowledged, this will be considered at detail design stage.
b	Manual controls for roof smoke vents must be located where these can be safely accessed by the fire brigade in the event of a fire.	Acknowledged, this will be considered at detail design stage.
26	**Building Regulations / Local Authority Requirements**	
a	The provisions of the Building Regulations and Local Authority Requirements in respect of fire must be addressed.	Acknowledged, this will be considered at detail design stage. Fire Certificate Application will be made following the planning process
27	**Storage of Archive / Paper Goods**	
a	Careful consideration is required for the location of such storage areas. Ideally in separate buildings more than 15m away from principal buildings and critical facilities or adequately segregated within fire compartments with at least 120 minutes fire resistance.	Acknowledged, this will be considered at detail design stage.

28	**Contractors**	
a	Contractors should be effectively controlled by means of method statements, supervision, adequate permits to work etc.	Acknowledged, this will be considered for detailed design, construction and operational stages
b	The Fire Prevention Association's document "Fire Prevention on Construction Sites" should be referred to and guidelines therein applied as appropriate. Available from www.thefpa.co.uk	Acknowledged, this will be considered for detailed design, construction and operational stages
29	**Building Safety File / O&M Manual**	
a	During the years after project completion, the Architect and Consulting Engineers may be contacted many times by Property Insurers and possibly Insurance Brokers regarding the specification for constructions (including wall & roof insulations) and fire protections (both passive & active). The building Safety File and / or O&M Manual should include a short "Property Insurers Information" summary section complete with A3 or A4 drawings of the above. This may ultimately save Architects and Consultants time dealing with future enquiries, and will reduce the likelihood of incorrect information being provided to future insurers.	Acknowledged
30	**Disaster Recovery**	
a	Consider if aspects of the project may impact on the client's disaster survival & recovery capability. This should be discussed with the client at an early stage.	Acknowledged, this will be considered at detail design stage.
31	**General**	
a	All designs, specifications and calculations should be submitted to Aon / insurers in duplicate for review and approval with the insurers prior to order, fabrication, and certainly installation. This will reduce the likelihood of a building being difficult (or costly) to insure at some time in the future, and will reduce the likelihood of a property insurance Surveyor or Engineer visiting shortly after completion and insisting on additional protections being installed or constructed (with implications for authorisation of additional funds).	Acknowledged

4. CONCLUSION

The existing and proposed site services are outlined and discussed. Existing ESB and telecoms services in the vicinity of the site will be utilised and surface and foul water management systems will be installed. Water supply is likely to be via a bored well.

Consideration is also given to design issues with respect to fire issues. The issues and appropriate time at which to consider them, raised by the applicants insurance brokers, are addressed.

Appendix 1

Rainwater Harvesting System (Indicative)

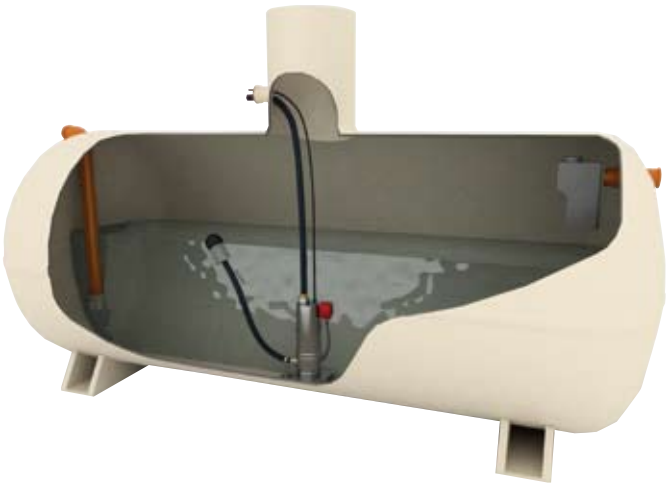
Rainwater Harvesting

BORD NA MÓNA

BORD NA MÓNA ENVIRONMENTAL LIMITED

Rainwater Harvesting

www.bnm.ie



- Use of a Natural Resource
- Easy to Install
- Easy to Maintain
- Fully Automated, User Friendly
- Collection & Delivery of Rainwater
- Storm Water Management Solution
- Reduced Water Bills

RainSava: The Bord na Móna Environmental Rainwater Harvesting Solution

Rainwater harvesting is not a new concept. Its popularity has increased significantly in recent years with the recognition that mains tap water is becoming an increasingly precious commodity. Rainwater offers a **sustainable, environmental alternative** to purified drinking water for non-potable use. Collecting rain from your roof also reduces surface water from your development and may offer a **storm water management solution**.

Nature delivers an abundant supply of soft rainwater, directly to your property. The roof, gutters and down pipes act as an inbuilt collection system. The RainSava rainwater harvesting system works by taking this rain, filtering out leaves and debris and storing the water in an underground tank. The water is then pumped into the property to be used for non-potable applications such as toilet flushing, washing machines and for outside use such as garden watering and car washing.

Three Important Principles of Rainwater Storage:

1. **Water that enters the tank must be 'calmed'** - i.e. rather than openly discharge into the tank it should be directed to the bottom where it can gently percolate upwards, below the minimum water level.

2. **The tank must overflow periodically**, at least twice per year, in order that any floating debris can be removed by the skimming effect of a suitable overflow device. For this reason the volume of the tank should be carefully calculated to ensure that overflow conditions occur.

   These first two principles are taken care of by the 'smoothing inlet' and the 'multisiphon' overflow trap fitted to RainSava tanks as supplied by Bord na Móna Environmental Ltd.

3. **Water should be extracted from the cleanest part of the tank**; i.e. just below the surface, as achieved by the use of a fixed or floating suction filter. This ensures that the water extracted avoids both floating debris and bottom sediments. It is important that this bottom sediment is not disturbed as in time it will form a beneficial biological layer that assists in maintaining water quality.

   Cleaning the leaf filter is the only routine maintenance necessary for the operation of the system, although a visual check of the tank and its components should be carried out on an annual basis.

   The RainSava system is made up of a number of separate components. Some of these are to be located in the underground storage tank, whilst the flow controller, the mains water top-up assembly and the level gauge (if used) are to be fitted in a convenient location within the building (e.g. utility or plant room).

RainSava Designed to Perform

The RainSava system from Bord na Móna Environmental has been **designed to the highest standard.**

- It is easy to install, maintain and use (full installation and operation manual supplied with each system).
- The superior quality of each individual component in the RainSava system ensures optimum performance and durability of the system.
- The Bord na Móna technical team and national network of Customer Agents can design a tailor made RainSava system to meet both Domestic and Commerical requirements.

RainSava Underground Storage Tank: Underground storage tanks are available in a range of sizes to suit domestic or commercial applications as required.

Leaf Filter: The RainSava system incorporates a leaf filter which is **located separately** in the rainwater pipe after it goes underground. (The leaf filter is installed similar to a gully trap). The unit contains a stainless steel filter which diverts the rainwater into the supply pipe to the RainSava underground storage tank.

The filter design ensures:

- That the rain water passes through the vortex filter and into the RainSava tank and any debris and leaves are filtered out.
- **Access to the filter** is simple ensuring ease of cleaning which in turn ensures that the quality of the water entering the RainSava storage tank is not compromised by having dirt or leaf particles in it.

Other Features of the RainSava System:

- **Smoothing Inlet Filter**: Calms the flow of water into the tank
- **Submersible Pump with Floating Suction Filter**: The floating suction filter maintains the position of the filter intake just below the water surface which is the site of the cleanest water. A fine mesh filter provides added filtration. The pump supplies water on demand by pumping it to specific appliances in the house.

- **Pressure Switch**: The pump is controlled by a combined pressure switch/flow controller which turns the pump on and off when required and also provides dry running protection for the pump should it be necessary.
- **Mains Water Top-Up**: The control system senses the water level within the underground tank. When stored water is not available the system automatically switches to mains water top up, provided by a solenoid valve, controlled by a float switch in the tank, thereby ensuring that a constant water supply is maintained without user intervention.
- **Overflow Trap**: This allows excess water in the tank to overflow into the on site drainage system, it also provides a water seal against any foul odours from drains and acts as a barrier to rodents.

- **Level Gauge (optional)**: Gives a visual indication of the water level in the underground storage tank.

RainSava Commercial System

Ideally Suited to Commercial Applications, the large roof area can catch a large volume of rain water. Suitable for:

- Office Buildings
- Warehouse & Factories
- Industrial Developments
- Schools & Public Buildings
- Farms and Agricultural Buildings
- Garden Centres & Nurseries
- Housing Developments
- Car & Truck Washes

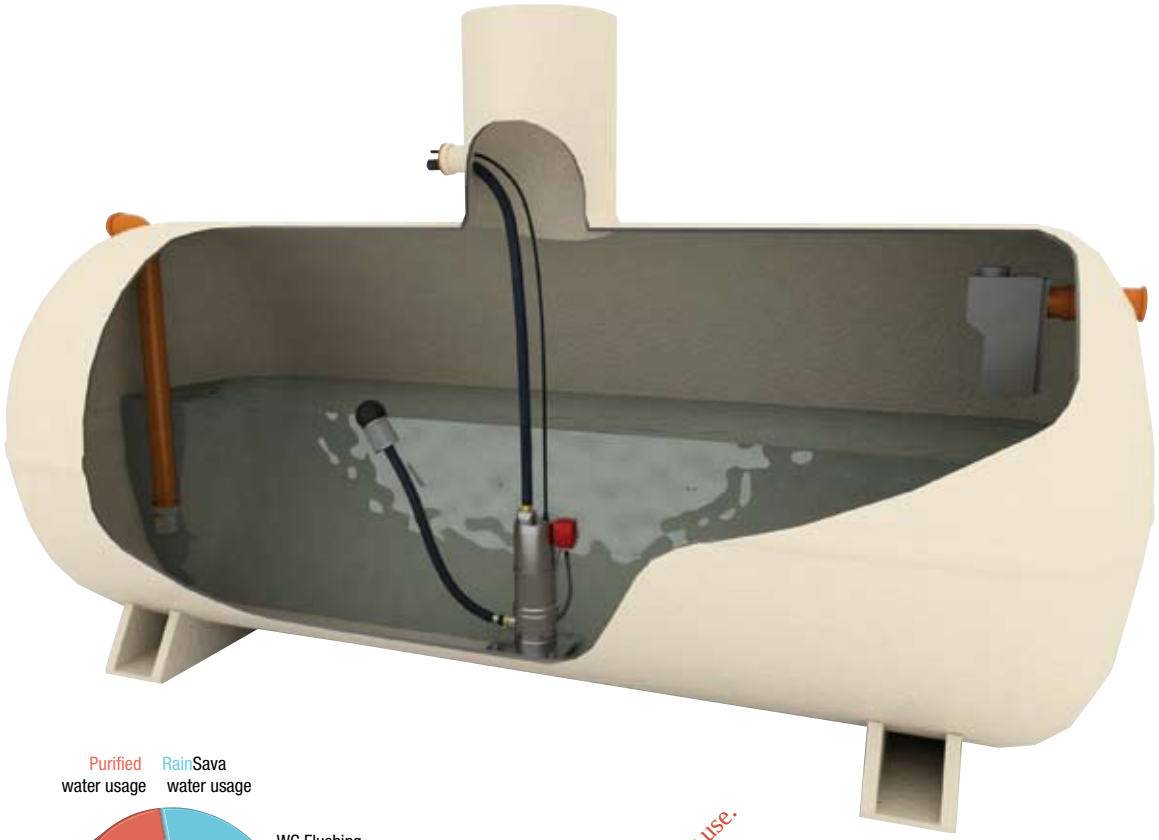
Benefits of the RainSava system for Commercial applications:

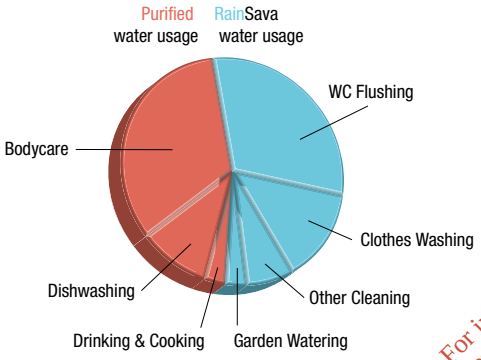
- Commercial developments have a greater requirement for non-potable water for uses such as toilet flushing, wash down etc. Rainwater collected from the roof can be used for non potable requirements.
- Commercial water is metered and businesses have to pay for water used – the RainSava allows you to replace mains water with rain water from your roof.
- The financial benefit by converting from mains water to rain water usage begins as soon as the RainSava system is installed and operational.
- Many commercial premises have large roof areas and are therefore able to collect large volumes of rainwater.
- The RainSava system can be designed specifically by the Bord na Móna Environmental technical team to meet the individual requirements of the business or premises – tailor made for your specific development.
- Direct or Gravity options are available – the Direct system pumps water from the RainSava storage tank. The Gravity system uses a header tank to store the filtered water from the RainSava tank and delivers the water by gravity to the required location.

Rainwater can be used for:

- **Toilet Flushing**
- **Wash down**
- **Vehicle Washing**
- **Irrigation**
- **Washing Machines**

Rainwater Harvesting





Purified water is required for drinking, cooking, dishwashing and bodycare: but these uses account for less than half the water usage of a typical household. Almost one third of the average household's water is flushed down the toilet. Rainwater can be used for toilet flushing, washing machine, garden watering and car washing.

Why Choose Bord na Móna Environmental?

- Over 20 year's industry experience.
- Supplier of reliable, sustainable rainwater harvesting solutions.
- Never compromise on quality.
- A range of options: Rainwater harvesting systems for a broad range of applications (single house and commercial systems available).
- Customer focused and responsive: assistance from pre-planning to delivery.
- International experience: Ireland, UK & USA.

Advantages of Rainwater Harvesting

- Can save up to 50% mains water usage.
- Reduced water bills.
- Improves sustainability of water use.
- Adds value to property.
- Low maintenance.
- Soft rainwater creates no lime scale.
- Below ground tank (cool and dark), low visual impact, no algae growth.
- Rainwater best for garden watering.

www.bnm.ie

Bord na Móna Environmental Ltd
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Tel: 1850 381136
Tel: 045 439000
Fax: 045 432312
E-mail: ed.info@bnm.ie
Web: www.bnm.ie

Product Range:

Rainwater Harvesting:

- RainSava Domestic & Commercial Systems

Single House:

- Puraflo Single House
- Platinum Single House (Package Plant)
- Puraflo Tertiary Treatment
- Phosphorus Reduction

Surface Water Treatment:

- Silt Traps
- Separators
- Storm Water Attenuation Tanks

Services:

- National Network of Agents/Installers
- Pre-Planning Site Specific Reports/ Quotations
- Delivery/Installation/Commissioning
- Service Contracts
- Maintenance Call Out Service

Commercial/Small Community Systems:

- Puraflo Multiple Module
- Puraflo Peat Filter Bed
- Puraflo Tertiary Treatment
- Moving Bed Biological Reactor (MBBR - Concrete Tank Mechanical Aeration)
- Platinum 2000 Series (GRP Package Mechanical Aeration)
- High Rate Sand Filters
- Reed Beds
- Pumping Stations
- Nutrient Removal
- Telemetry Monitoring
- Flow Metres
- Composite Sampling

Appendix 2

Proprietary Wastewater Treatment System

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Contact us:

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Wastewater Solutions

Product Range:

Commercial/Small Community Systems:
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- Flow Metres
- Composite Sampling

Rainwater Harvesting:
- RainSava Domestic & Commercial Systems

Surface Water Treatment:
- Silt Traps
- Separators
- Storm Water Attenuation Tanks

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Puraflo

SEWAGE TREATMENT

Small Community Systems

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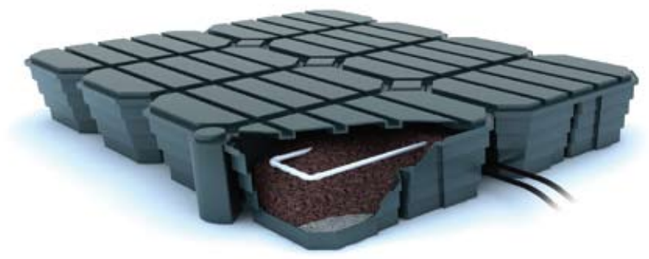


- Secondary Treatment
- Tertiary Treatment Option
- Flexible Modular System
- Cost Efficient and Effective
- Minimal Maintenance
- Proven Track Record
- Unique System Design
- High Treatment Efficiency

Wastewater Solutions

Puraflo: the Bord na Móna Environmental Sewage Treatment Solution

If you require a sewage treatment system or if you have an existing septic tank /sewage treatment plant that needs upgrading, **Bord na Móna Environmental has a sewage treatment solution for you.**

Why choose Bord na Móna Environmental?

- Leading designer, manufacturer and supplier of sewage treatment systems for more than 20 years.
- Supplier of reliable, sustainable, long-term solutions for on-site sewage treatment.
- Systems and treatment processes for a wide range of applications including:
  - Single houses
  - Businesses
  - Hotels
  - Caravan parks
  - Schools etc.
  - Housing developments
  - Leisure centres
  - Golf clubs
  - Nursing homes
- Customer Focused and Responsive: Customer assistance from pre-planning to project completion, warranty, service agreements, maintenance call-out service.
- International Experience: Ireland, UK, USA.

What Our Customers Say:

Customers come to Bord na Móna Environmental for a sewage treatment system and gain the added benefit of the company's long term experience and its focus on customer service:

"I bought the Puraflo sewage treatment system as it's the best on the market and was highly recommended by our architect. Purchasing the system was very easy and staff were extremely helpful".

"Top class service re submitting a plan and installed the system on the day that was appointed. Excellent service and I have recommended your system to others".

Our Clients Include:

Builder Contractors
Civil Contractors
Engineers
Architects
Commercial Businesses
Homeowners
Local Authorities
Self-Builders/Extenders & Renovators etc.

Puraflo: The System

The Puraflo Peat Bio-Filter is designed to provide effective, cost efficient, low maintenance, secondary and/or tertiary wastewater treatment.

The company's extensive experience with the Puraflo system and long-term research on the performance of the system shows extremely high treatment efficiency with significant reductions in the BOD and TSS content of wastewater and similarly high reductions in faecal coliforms and bacterial numbers.

Puraflo Multiple Module System: The modular nature of the system provides maximum design flexibility for secondary and tertiary treatment across a range of applications. Additional modules can also be added to existing Puraflo systems to provide increased capacity where required.

Puraflo Peat Filter Bed: The peat media can also be housed in site constructed retaining structures depending on site-specific requirements.

Puraflo System Design

POPULATION EQUIVALENT P.E.	MAXIMUM DAILY FLOW M^3/d	APPLIED ORGANIC LOAD Kg/d BOD	NO. OF MODULES	ASSOCIATED SEPTIC TANK
20	3.6	1.2	8	5.6
50	9	3	18	11
80	14.4	4.8	28	16.4
100	18	6	36	20
150	27	9	54	29

Puraflo: Process Description

- Wastewater flows into a watertight primary/septic tank. The solids settle and the liquid effluent flows by gravity to a pump/sump chamber through an outlet filter.
- The liquid effluent is pumped intermittently to the Puraflo modules where it is dispersed evenly onto the surface of the peat fibre and percolates through the media.
- Treatment of wastewater within the system is achieved by a combination of unique physical, chemical and biological interaction between the wastewater and the fibrous peat media.
- Considerable BOD, TSS and NH3-N reductions are achieved and the system is also very effective in the elimination of enteric bacteria contained in the wastewater.
- The treated liquid emerges from the Puraflo modules and disperses into the ground through a percolation area or is collected for disposal by other methods.
- The Puraflo system is low maintenance and requires no desludging or backwashing.

Installation & Commissioning:

The Puraflo Community System is installed and commissioned by Bord na Móna Environmental Ltd.

Puraflo: The Benefits

- Simplicity of design, installation and operation.
- Secondary and/or Tertiary treatment.
- High treated effluent quality.
- Low capital and operating costs.
- Intermittent pumping to Puraflo means reduced power consumption & increased cost efficiency.
- No desludging or backwashing required.
- Flexible, modular design.
- Seasonal or intermittent use.
- Retrofits existing plants to improve effluent quality.

Warranty, Servicing & Maintenance

Bord na Móna Environmental Ltd. provide a 12 month parts and labour guarantee. The company also offers service inspection contracts designed to suit client's individual needs.

Tertiary Treatment

Further enhance the treated effluent quality with a Puraflo Tertiary Treatment option. The Puraflo system is ideally suited for tertiary treatment and can be included as part of a new treatment system or retro fitted to an existing treatment plant where a higher effluent quality is required for discharge.

Intermittent and Seasonal Use

The Bord na Móna Puraflo system is proven effective in situations of intermittent or seasonal loading. Due to the water binding properties of the peat, the media and consequently the microbial film do not dry out upon reduction or complete cessation of wastewater supply. This unique property, combined with the physical and chemical processes which take place in the peat ensure that a high level of treatment is maintained during variable loading conditions.

Optional Extras

- **Pump Stations**
- **Nutrient Removal**
- **Telemetry**
- **Instrumentation**

Performance (Secondary Treatment)

PARAMETER	INFLUENT	EFFLUENT
B.O.D (mg/l)	300	20
T.S.S. (mg/l)	200	30
NH3-N (mg/l)	30	5
Total Coliforms	1×10^8	>99.9%
Pathogenic Bacteria**	Present	Absent

* CFU's per 100ml ** Including Salmonella, Staphylococcus and Shigella species, Pseudomonas aeruginosa and Sulphide reducing Clostridia

ATTACHMENT E – EMISSIONS

Attachment E.1 Emissions to Atmosphere

Emissions to atmosphere have bee assessed in the accompanying EIS and the relevant text is reproduced here as follows:

Existing Air Quality

There is no EPA air monitoring station in the vicinity of the proposed site. Consequently, to assess the ambient air quality at the proposed site location, total dust deposition monitoring was conducted by an FTC scientist in November 2009 within the boundaries of the proposed site.

Bergerhoff gauges were used to determine total dust deposition at the site during a single monitoring event in 2009 at two locations. Monitoring was carried out in accordance with the Standard Method VDI 2119 (Part 2, 1996) - (Measurement of Dustfall, Determination of Dustfall using Bergerhoff Instrument (Standard Method) German Engineering Institute) for a 30 day period. Dust deposition was measured for both organic and inorganic dust.

Under the Air Pollution Act 1987, dust is considered a pollutant if concentrations are such that it is injurious to public health, deleterious to ecology, or impairs or interferes with amenities or the environment. This definition of air pollution has been transposed into the Protection of the Environment Act 2003. There are no statutory standards in Ireland for the control of dust nuisance.

The TA Luft Guideline entitled 'Technical Instructions on Air Quality Control, 2001', which is frequently applied as a guideline in Ireland, sets a limit of 350 mg/m^2/day for dust deposition. A review of existing waste licences for similar facilities indicates that the EPA typically propose dust deposition limits (for fugitive emissions) as not exceeding 350 mg/m^2/day per monthly mean in accordance with the TA Luft VDI Method 2119.

Dust Monitoring Results

The results of the monitoring carried out are presented in the following table. The results show that the background dust levels present on-site was low during the monitoring period. All results are within the evaluation criteria level of 350 mg/m^2/day.

Location	Total Dust mg/m^2/day	Organic mg/m^2/day	Inorganic mg/m^2/day
D1	58	53	<10
D2	55	43	12

Impacts on Air Quality

Construction Phase Impacts

Dust emissions arise when an operation causes particulate matter to become airborne. This airborne dust is then available to be carried downwind from the source. The amount of dust generated and emitted from a working site and the potential impact on surrounding areas varies according to the following:

- The type and quantity of material and working method
- Climate/local meteorology and topography

The principal source of dust emissions during construction will be associated with the:

- Clearing and peat stripping at the site
- Placement of fill material during construction
- Construction of key infrastructure
- Construction of access road

The potential impacts from construction will be temporary in nature as the proposed construction programme is estimated at 9 - 12 months.

Operational Phase Impacts

During the operation of the facility potential dust emissions may arise from:

- Waste delivery, processing and the movement of vehicles to and from the site
- Storage of waste material
- Traffic generated emissions

The potential dust impacts arising from the proposed development have been assessed qualitatively by considering the following factors:

- the likelihood of dust arising during the process, with regard to the design and process flow of the operation
- the location of sensitive receptors in relation to the proposed facility
- the effect of varied meteorological conditions on the dispersion of dust emissions
- general housekeeping practices adopted at the site

The greatest impact of dust blowing from the proposed development must be expected at sensitive receptors directly downwind of the site. Based on the Mullingar synoptic station windrose depicted in Figure 3-9, the prevailing wind direction is from the southwest. Dust impact would therefore be expected to be most apparent downwind of the prevailing wind. No sensitive receptors have been identified downwind of the site.

The Waste Reception and Processing Building will accept 'brown bin' biowaste material for bulking up prior up prior to transportation on for further processing. This material has the potential to generate some minor localised odour with the impact depending on the degree of degradation of the material prior to acceptance at the facility.

Mitigation Measures for Air Quality

Construction Phase

During the construction phase, a dust control plan will be implemented as part of the Construction Environmental Management Plan. Adherence to this plan will form part of the civil works contract. The dust control plan will include the following best practice measures:

- During stripping of the top layer of peat, a water bowser will be available to spray exposed materials if material is deemed to be giving rise to dust generation. Additionally, the stripping of peat will be avoided (where possible) during periods of dry, windy weather
- Wheel mats will be used where required throughout the site
- All loads entering and exiting the site will be required to be covered or damp to avoid dust emissions along local roads
- Stockpiles, if present, will be sprayed during periods of dry weather, if necessary
- A strict speed limit of 20 km/hr will be enforced for vehicles
- Regular cleaning of public roads will be carried out where necessary

Operational Phase

Best available technology (BAT) considerations will be employed in all design aspects of the proposed facility. The Waste Reception and Processing Building will be operated under negative pressure such that extracted air will pass through an appropriate dust filtration system located to the rear of the processing building.

The area of the Waste Reception and Processing Building where biowaste material will be accepted will be operated under a separate negative pressure extraction system with extracted air being passed through an appropriate peat or woodchip based biofiltration system to ensure adequate treatment of potentially odiferous air. Regular vehicle services will ensure that engines are in prime working condition so that vehicle emission will be within required limits at all times. In addition, the internal facility roads will have an asphalt finish which will mitigate against traffic related dust emissions.

Attachment E.2 Emissions to Surface Water

Emissions to surface water have been assessed in the accompanying EIS and the relevant text is reproduced here as follows:

Existing Surface Water Quality

Water Framework Directive

The Water Framework Directive (2000/60/EC) was established by the European Community in 2000. This Directive was transposed into Irish legislation in December 2003 as the European Communities (Water Policy) Regulations 2003, (S.I. No 722 of 2003). The overriding purpose of the Water Framework Directive is to achieve at least 'good status' in all European waters by 2015 and ensure that no further deterioration occurs in these waters. European waters are classified as groundwaters, rivers, lakes, transitional and coastal waters. The Water Framework Directive has been implemented in Ireland by dividing the island of Ireland into eight river basin districts. The proposed facility is located in the Eastern River Basin District (ERBD).

The ERBD is home to approximately 40% of Ireland's population, comprising a land area of approximately 6,500 km^2 and includes Dublin City and the towns which form the Greater Dublin Area and its commuter belt. The Eastern River Basin District incorporates all or part of twelve local authority areas: Dublin City, Offaly, Westmeath, Meath, Kildare, Wicklow, Cavan, Dun Laoghaire-Rathdown, Fingal, South Dublin and small portions of Wexford and Louth.

There are 356 river water bodies in the ERBD comprising of the river catchments of the Boyne, the Liffey, the Avoca/Varty and the Nanny/Devlin.
The facility is located close to the Mongagh River, which is a tributary of the River Boyne. The waterbodies within the ERBD are divided into 'water management units' (WMU). The Mongagh River is incorporated into the WMU entitled 'Boyne Upper WMU' via the water body 'YellowTRIB_Castlejordan'.

A baseline risk assessment was completed of the water bodies within each River Basin District in 2005. Four types of pressures, created by human activities, were identified which can cause deterioration of water quality if not managed properly. These are:

- sewage and other effluents discharged to waters from point sources, e.g. outfall from treatment plant
- discharges arising from diffuse or dispersed activities on land
- abstractions from waters
- structural alterations to water bodies

Risk assessment procedures were developed to analyse the impact of these pressures on water bodies in the district. Four categories of risk were created to assess how sensitive the water bodies are from the pressures above.

- *Not at Risk:* Sufficient information is available to determine that the impact of the pressures on the water body is such that the water body is likely to achieve good status. In some cases monitoring data is available to confirm the good quality status of the water body. Measures must be considered here to ensure deterioration from good status does not occur. Approximately 2.3% of the catchment area of the ERBD falls under this category

- *Probably Not at Risk*: Sufficient information is not available at present to determine whether the water body is at risk of failing to meet good status. However, based on existing available data, it is probable that the water body will be found to be not at risk when further information becomes available. Approximately 23.6% of the catchment area of the ERBD falls under this category

- *Probably at Risk:* Sufficient information is not available at present to determine whether the water body is at risk of failing to meet good status. However, based on existing available data it is probable that the water body will be found to be at risk when further information becomes available. Approximately 25.5% of the catchment area of the ERBD falls under this category

- *At Risk*: Sufficient information is available to determine that the impact of pressures on the water body is such that the water body is unlikely to achieve good quality status unless measures are taken to reduce the impact, thereby improving the water quality. Approximately 48.6% of the catchment area of the ERBD falls under this category

The results of this assessment indicate that the Mongagh River is 'at risk' of not achieving good status by 2015. The ERBD *River Basin Management Plan 2009-2015* currently classifies the 'YellowTRIB_Castlejordan' waterbody as having 'Poor Status' and the overall objective of the ERBD is to 'restore' the status of the river.

Article 4 of the Water Framework Directive permits extensions to the deadline of achieving 'good status' by 2015 under certain circumstances. The ERBD *River Basin Management Plan 2009-2015* lists the waterbodies which have an alternative target date for achieving 'good status'.

The Boyne Upper WMU is included in this list and is not expected to achieve "good status" until 2027 for the following reason:

Due to peatlands: naturally occurring ammonia. Diffuse agricultural and wastewater point source pollution. Extrapolated sub-catchments – need more data

Biological Water Quality of Receiving Waters

The composition of the macroinvertebrate community is assessed according to these groups and this is then used to derive a Q Index. The EPA scheme of Biotic Indices or Quality (Q) Values and their relationship to water quality are set out in the table below.

Q Value	Community Diversity	Water Quality	Condition[a]
Q5	High	Good	Satisfactory
Q4	Reduced	Fair	Satisfactory
Q3	Much reduced	Doubtful	Unsatisfactory
Q2	Low	Poor	Unsatisfactory
Q1	Very low	Bad	Unsatisfactory

[a] 'condition' refers to the likelihood of interference with beneficial or potential beneficial uses.

Intermediate indices Q1-2, 2-3, 3-4 and 4-5 are also used to denote transitional conditions. The scheme mainly reflects the effects of biodegradable organic wastes (deoxygenation and eutrophication).

Where a toxic effect is apparent or suspected the suffix '0' is added to the biotic index (e.g. Q 1/0, 2/0 or 3/0). Attention is sometimes drawn to siltation or atypical effects by appending an asterix to the biotic index. The scheme can be simplified as shown by the classification set out in **Error! Reference source not found.**the following table.

Biotic Index	Quality Status	Quality Class
Q5, 4-5, 4	Unpolluted	Class A
Q3-4	Slightly polluted	Class B
Q3, 2-3	Moderately polluted	Class C
Q2, 1-2,1	Seriously polluted	Class D

Class A waters are those in which problems relating to existing or potential uses are unlikely to arise. They are therefore regarded as being in a satisfactory condition. Classes B, C and D are to a lesser or greater extent unsatisfactory in this regard. For example, the main characteristic of Classes B and C waters is eutrophication, which could interfere with the amenity, abstraction for water supply, or fisheries.
The closest EPA monitoring station to the proposed facility on the Mongagh River is at Baltinoran Bridge (07C040100) some 4 km downstream of the proposed facility location. The table below outlines the Q Values measured at Baltinoran Bridge.

There is no EPA monitoring stations on the Mongagh River upstream of the proposed facility although there are two other stations on the Rochfortbridge Stream and Castlejordan River (07C040060 & 07R040300), all downstream of the proposed development.

Sampling Stations		Q Values						
No.	Location	1981	1985	1990	1994	1997	2000	2003
0100	Baltinoran Br	4-5	3-4	4	3-4	3-4	4	3

The above table shows that in 2003 the water quality at Baltinoran Bridge can be described as moderately polluted (Q3). According to the EPA Water Quality Monitoring Report (2003), sewage from Rochfortbridge is suspected as the most likely cause of the moderate pollution of the river at Baltinoran Bridge in 2003.

Physio- Chemical Water Quality

The EPA does not have any chemical monitoring data for the Mongagh River and it should be noted that one of the reasons provided by the ERBD for exempting the river from achieving 'good status' in 2015 was due to lack of data.

Surface water sampling on the Mongagh River was therefore undertaken by FTC personnel on the 17th November 2009. Grab samples were taken from the Mongagh River upstream and downstream of the proposed facility. The samples were sent to Alcontrol Laboratories for analysis. The results of the water quality monitoring of the Mongagh River is shown in the following table.

Parameter	Unit	SW1 (Upstream)	SW2 (Downstream)
BOD	mg/l O	1.12	1.37
Phosphate (ortho as PO4)	mg/l	<0.0800	<0.0800
Ammoniacal Nitrogen as N	mg/l as N	0.456	0.33
Dissolved Oxygen	mg/l	6.4	6.8
Temperature	°C	9.2	9.3
pH	pH units	7.82	7.6
COD	mg/l O	40.6	47.4
Nitrite	mg/l	0.098	0.105
Nitrate	mg/l	11.4	9.12
Total Organic Carbon	mg/l	17.9	19.9
Sulphate (soluble)	mg/l	64.5	74.9
Conductivity (at 20 deg.C)	mS/cm	0.664	0.661
Chloride	mg/l	16.9	14.7
Total Alkalinity Filtered as CaCO3	mg/l	317	301
Total Oxidised Nitrogen as N	mg/l	2.6	2.09
Mercury Dissolved	µg/l	<0.0100	<0.0100
Calcium Dissolved	mg/l	158	189
Sodium Dissolved	mg/l	8.94	10.8
Magnesium Dissolved	mg/l	8.17	9.04
Potassium Dissolved	mg/l	4.03	2.92
Iron Dissolved	mg/l	<0.0190	0.231
Cadmium Dissolved	µg/l	<0.220	<0.220
Chromium Dissolved	µg/l	6.63	6.95
Copper Dissolved	µg/l	2.88	2.6
Lead Dissolved	µg/l	<0.400	<0.400
Manganese Dissolved	µg/l	122	156

Parameter	Unit	SW1 (Upstream)	SW2 (Downstream)
Nickel Dissolved	µg/l	8.36	6.83
Zinc Dissolved	µg/l	17.3	5.87
Total coliform	No./100ml	804	510
Faecal coliforms	No./100ml	108	55

The following table compares the background measured water quality in the Mongagh River to the environmental quality standards outlined in Table 9 of the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (SI No. 272 of 2009) assuming 'good status'.

Parameter	Unit	SW1 (Upstream)	'Good Status' 95%ile
BOD	mg/l O	1.12	2.6
OrthoPhosphate	mg/l P	<0.026	0.075
Total Ammonia	mg/l N	0.554	0.14

As can be seen from the table above, concentrations of BOD and Orthophosphate in the Mongagh River upstream of the proposed facility are well below the 95%ile environmental quality standard for a river with 'good status'. The background concentrations of these parameters are also below the mean quality standards for a river of 'good status' (BOD 1.5 mg/l and Orthophosphate 0.035 mg/l P).

The previous table shows that the background ammonia concentration in the river is quite high. The ERBD *River Basin Management Plan 2009-2015* states that this ammonia is naturally occurring due to the peatlands in the area.

The national flood hazard mapping website does not indicate any history of flooding within 2.5 km of the proposed site to be developed at Drumman. The nearest incident of flooding recorded is at a distance of 18 km downstream in the River Boyne at Ballybogin Bridge. The incidence of flooding recorded at Ballybogin Bridge and Ballycowan further downstream are at such a distance from the proposed site to be developed that it is not considered that the site would either be impacted by this flooding nor would it contribute to any significant increase in flooding at this location.

Impacts on Surface Water Quality

Wastewater will be produced on site from the welfare facilities (e.g. toilets, showers, canteen) and from washdown within the waste reception and processing building.

The wastewater will be treated on site in a proprietary wastewater treatment plant (Puraflo of similar) and discharged to the Mongagh River. It is proposed that the effluent receive secondary treatment to a standard of 20:30 (BOD mg/l: Suspended Solids mg/l) as per 'BS6297 The Code of Practice for the Design and Installation of Small Sewage Treatment Works and Cesspools'.

It is assumed that, once operational, there will be approximately 30-35 no. staff working at the facility. The wastewater loading was calculated using the 'EPA Wastewater Treatment Manual, Treatment Systems for Small Communities, Business, Leisure Centres and Hotels' for an industrial office and/or factory with canteen:

- Flow - 60 l/day per person
- BOD – 30 g/day per person

The individual areas of the waste reception and processing building will be washed down at different intervals depending on the level of contamination of the waste being sorted within the areas. For the purposes of sizing the onsite WWTP, the maximum flow from the building will occur when all three areas are washed down on the same day. It is assumed that it will take approximately 2 hours to wash down the building with a standard hose with a flow rate of 1 l/s. The maximum flow to the onsite wastewater treatment plant and subsequently discharging to the Mongagh River is therefore estimated as 9,000 l/day.

The assimilative capacity of a river determines the maximum discharge that can be tolerated by the river without deteriorating the quality of the river water. To estimate the assimilative capacity of a freshwater river, to determine if the receiving waters can absorb the wastewater discharge, the following formula1 is used:

$$\textbf{Assimilative capacity [kg/day]} = (C_{max} - C_{back}) \times F \times 86.4$$

Where

C_{max} = maximum permissible concentration [mg/l] based on legislative standards and design guides
C_{back} = background (upstream) concentration [mg/l]
F = the flow in the receiving waters [m^3/s]
86.4 = conversion factor.

Calculations were done to determine the impact of the discharge of the treated effluent on the receiving waters if the wastewater treatment plant was designed for a throughput flow of 9,000 l/day and was operating at full capacity. These calculations were done using the mass balance equation. This calculates the predicted concentration of a parameter in the stream downstream of the outfall, based on the concentration of the parameter in the effluent and in the river upstream of the outfall. These calculations were limited to assessing the impact of the treated effluent on the river with respect to three parameters: Biochemical Oxygen Demand (BOD), Orthophosphate and Ammonia.

The flow in the river was obtained from the register of hydrometric stations maintained by the EPA on their website. This register provides hydrometric data from gauging stations located on rivers and streams throughout the country. An active gauging station exists just upstream of the proposed development on the Mongagh River. Details from the gauging station are provided in the following table.

Station Number	Station name	River	Catchment Area (km^2)	95 Percentile Flow (m^3/s)	Dry Weather Flow (m^3/s)
07028	Derrygreenagh	Mongagh	15	0.03	0.015

Details of the assimilative capacity calculations are provided in the appendices of the accompanying EIS and are discussed below.

BOD

The BOD assimilative capacity was calculated on the basis that the maximum BOD concentration in the river is limited to 2.6 mg/l as described previously and the 95 percentile flow. The effluent BOD was taken to be 20 mg/l at the outfall.

The followings figures were calculated:

Background BOD Concentration	=	*1.12 mg/l*
BOD Assimilative Capacity of Receiving Waters	=	*3.84 kg/day*
BOD Load Discharged from the plant	=	*0.18 kg/day*
% of A.C. consumed	=	*4.68%*
Estimated Downstream BOD concentration	=	*1.19 mg/l*
% increase in BOD in receiving waters	=	*5.8%*

Therefore, in terms of BOD, the assimilative capacity of the receiving waters is sufficient to cater for the proposed discharge and the impact is not significant with a BOD increase of 5.8%. The estimated downstream concentration of BOD (1.19 mg/l) is below the allowable 95 percentile concentration for a river waterbody with 'good status' (2.6 mg/l). It is also below the allowable mean concentration for a river of 'good status' (1.5 mg/l).

[1] National Urban Waste Water Study, Volume 2, Part A, Methodology, *5. Assimilative Capacity of Receiving Waters.*

Orthophosphate

The Orthophosphate (OP) assimilative capacity was calculated on the basis that the maximum OP concentration in the river is limited to 0.075 mg/l as described previously and the 95 percentile flow. The effluent OP was taken to be 2 mg/l at the outfall.

The followings figures were calculated:

Background OP Concentration	=	*0.026 mg/l P*
OP Assimilative Capacity of Receiving Waters	=	*0.13 kg/day*
OP Load Discharged from the plant	=	*0.018 kg/day*
% of A.C. consumed	=	*14.17%*
Downstream OP concentration	=	*0.033 mg/l*
% increase in OP in receiving waters	=	*26.3%*

In terms of OP, the assimilative capacity of the receiving waters is sufficient to cater for the proposed discharge and the estimated downstream concentration of OP (0.033 mg/l) is below the allowable 95 percentile concentration for a river waterbody with "good status" (0.075 mg/l). It is also below the allowable mean concentration for a river of 'good status' (0.035 mg/l).

Ammonia

The background concentration of Ammonia in the Mongagh River is higher than the allowable 95 percentile concentration in a river waterbody with 'good status' as discussed previously; therefore the assimilative capacity of the river could not be assessed.

Mass Balance calculations have been carried out to establish the impact of the effluent on the ammonia concentration in the receiving waters (see Appendix 8 for full calculations). These figures can be summarised as follows:

95%ile Flow in Receiving Waters	=	*30 l/s*
Estimated Discharge Volume (at outfall)	=	*0.1 l/s*
Background Ammonia Concentration	=	*0.554 mg/l*
Ammonia Concentration in Effluent	=	*2 mg/l*
Estimated Downstream Ammonia concentration	=	*0.559 mg/l*
% increase in Ammonia due to Effluent	=	*0.9%*

The ammonia concentration in the receiving waters will be increased from 0.554 mg/l to 0.559 mg/l. This equates to a 0.9% increase in ammonia concentrations at 95 percentile flow. This is an insignificant increase and no appreciable impact will be caused by the effluent on the receiving waters with respect to ammonia.

Analysis

The above calculations conclude that the assimilative capacity of the receiving waters with respect to BOD and Orthophosphate is adequate to cater for the proposed discharge. The receiving waters have been found to contain elevated levels of naturally occurring ammonia. However, given the flows in the river and the associated dilution available, the proposed discharge will have a negligible effect on these concentrations.

On the basis of the assimilative capacity calculations outlined, it is concluded that the proposed discharge from the development at Drumman will have a negligible impact on the quality of the Mongagh River.

The principle hydrological impact from the proposed development is an increase in run-off. It has been established that the increase in flow as a result of the proposed development is approximately 1 % and is determined to be of low significance.

Mitigation Measures for Water Quality

Mitigation Measures during Construction

The mitigation measures proposed during the construction phase are outlined as follows and include measures to prevent runoff, erosion from vulnerable areas and consequent sediment release into the nearby watercourses receiving flow from the proposed development site. These measures are described in more detail below.

- The ground preparation for the development will initially require the excavation of the peat layer throughout the site. This peat layer will be formed into landscaped peat berms throughout the site. The gravel layer below the peat layer will be infilled with good quality stone. During the period of ground preparation, this could lead to an increase in silt-laden run-off draining off site. Silt fencing will be provided to protect existing drains and the river bank to the north of the site, see Appendix 8 for details of silt fencing.

- The attenuation pond and discharge pipe will be installed in advance of construction. The attenuation pond will also provide for sediment removal.

- Construction activities will be located away from watercourses as far as possible. The contractor will ensure that trafficking on site is kept to a minimum and the routes of haul roads are kept away from watercourses as far as possible. Where haul roads pass close to watercourses, silt fencing will be used to protect the streams. Wheel washing facilities will be provided at the site entrance draining to silt traps. Additional silt fencing will be kept on site in case of an emergency break out of silt laden run-off.

- The contractor shall ensure that erosion control and attenuation facilities, namely sediment/silt-traps and ponds are regularly maintained during the construction phase. The contractor shall ensure that all personnel working on site are trained in pollution incident control response. During the construction period, it is envisaged that a facility to shut off the outfall from the attenuation pond during an emergency will be provided. This will mitigate any accidental spillage on site impacting on the watercourse and the size of the ponds (designed for a 1 in 100 year return flood event) will allow sufficient time to arrange for cleaning up the relevant pollutant in the attenuation pond. In addition, appropriate signage will be placed on site outlining the spillage response procedure and a contingency plan to contain silt. A regular review of weather forecasts of heavy rainfall is required and the contractor is required to prepare a contingency plan for before and after such events.

- Standing water in the excavations will contain an increased concentration of suspended solids as a result of the disturbance to the underlying soils below the peat. The excavations will be pumped into temporary settlement basins which will be lined and which will drain to the attenuation pond.

- The contractor will carry out visual examinations of watercourses receiving flows from the proposed development during the construction phase and regular water samples will be taken.

- Any diesel or fuel oils stored on site will be bunded to 110 % of the capacity of the storage tank. Design and installation of fuel tanks to be in accordance with best practice guidelines BPGCS005, oil storage guidelines. Refuelling of plant during construction will be carried out on a designated concrete pad, away from watercourses, draining to an oil interceptor. Drip trays and spill kits will be kept available on site. Only emergency breakdown maintenance will be carried out on site. Appropriate containment facilities will be provided to ensure that any spills from the vehicle are contained and removed off site.

- Portaloos will be used to provide toilet facilities for site personnel. Sanitary waste will be removed from site via a licenced waste disposal contractor.

- If wet concrete operations are required within or adjacent to watercourses, a suitable risk assessment should be completed prior to works being carried out.

Mitigation Measures during operation

When operational, the development will have a negligible effect on surface water quality due to sedimentation as there will be no further disturbance of soils post construction. During the operation phase, small quantities of oil will be used in operations. There is potential for oil spills, but they are not likely to be significant, should they occur. A full retention petrol interceptor will be provided to remove hydrocarbons from the run-off coming from any areas at risk, see the proposed drainage layout in Figure 5-9.

The foul water emanating from the proposed development will be subject to secondary treatment in a proprietary onsite wastewater treatment plant prior to discharge to the Mongagh River. The flow from the WWTP will be sampled regularly in accordance with the requirements of the facility waste licence to ensure the plant is operating to the required standard.

The maintenance of the drainage system will include for the activities associated with keeping the system operating effectively. The operator will have the responsibility for maintaining the drainage system. The maintenance regime will include:

- inspecting manholes for any blockages
- inspecting outfalls to watercourses
- inspecting the ponds and testing the water quality at the outfalls as per licence requirements

Maintenance shall be in accordance with CIRIA C697 SuDS and Maintenance Manual and the WWTP maintenance manual. Weekly inspections will be required during the construction phase with periodic assessment as required during the operational phase.

Attachment E.3 Emissions to Sewer

As there is no public sewer in the vicinity of the development, no emission to sewer will result.

Attachment E.4 Emissions to Groundwater

There will be no direct emissions to groundwater from the proposed activities at the site. It is proposed that groundwater quality monitoring be conducted at the location of the groundwater bolehole that will supply the site, when this location is identified.

Attachment E.5 Noise Emissions

Noise emissions have been assessed in the accompanying EIS and the relevant text is reproduced here as follows:

Noise in the existing Environment

Daytime noise measurements were taken at the site during a single monitoring event on 14 December 2009. Night-time noise monitoring was carried out during a single event on the 22 February 2010. All measurements were taken for a period of 30 minutes at the five identified noise monitoring locations. All measurements were taken outdoors at the identified noise monitoring locations and are considered representative of the noise regime in the locality. The noise survey was carried out using a Brüel and Kjær Model No. 2250 Type 1 SLM, referred to earlier.

Noise modelling was carried out without any specific mitigation measures directed at the noise sensitive locations (e.g. noise barriers, earth bunds). However, two different scenarios were considered:

- Scenario 1 - Operation of the waste reception and processing building with doors open and
- Scenario 2 - Operation of the waste reception and processing building with doors closed (standard operating conditions)

A summary of the noise monitoring results are presented in the following table and a full set of results is presented in Appendix 4 of the accompanying EIS.

Overall, the results indicate that noise in the area is dominated by the sound of traffic movements (including heavy goods vehicles) on the R400 road route and influenced by distant traffic movement sounds on the M6 motorway north of the monitoring locations.

Daytime L_{Aeq} levels of between 46 – 62 dB were recorded during monitoring. Noise levels over 55 dB were recorded at NML1 and NML4. However at both locations the number of passing vehicles on the R400 greatly influenced the results. 69 No. traffic movements recorded during the 30 minutes of monitoring at NML1 and 51 no. traffic movements recorded at NML4. The L_{AF10} of 65 dB at NML1 and 63 dB at NML4 during the monitoring period shows the traffic influence on baseline noise levels at the locations, while background levels, L_{AF90}, were 56 dB at NML1 and 37 dB at NML4, which is more typical of the noise levels at the locations. The L_{AF90} at NML1 is high due to the number of vehicles that passed during the monitoring period, more than two vehicles every minute.

The L_{A90} noise levels were lower than the L_{Aeq} noise levels at all locations. The daytime L_{AF90} ranges from 37 - 56 dB. The L_{AF90} at each location, excluding the upper 10% of noise, such as noise from traffic movements, is considered more representative of the noise levels in the area.

The monitoring environment was noted to be quiet with no tonal element identified while monitoring. The presence of tonal elements was assessed by 1/3 octave analysis of the results (Appendix 4).

Night-time L_{Aeq} levels of between 37 – 57 dB were recorded during monitoring. Noise levels over 45 dB were recorded at NML1, NML2 and NML4. At NML1 and NML2 4 no. vehicle movements were recorded passing during both monitoring periods. The vehicle movements impacted the L_{Aeq} levels. At NML1 the L_{A10} of 54 dB and the L_{A1} of 66 dB and at NML2 the L_{A10} of 43 dB and the L_{A1} of 68 dB shows that the noise occurring for 10% and 1% of the monitoring period contributed greatly to the high L_{Aeq}. At NML4, 1 no. vehicle movement was recorded during the monitoring period. Again L_{A10} of 39 and L_{A1} of 59 dB show the impact on the L_{Aeq} of short duration noise events during the monitoring period.

The L_{A90} noise levels were lower than the L_{Aeq} noise levels at all locations. The night-time L_{A90} levels ranged from 19 – 32 dB which is more representative of the background noise levels in the area.

The night-time monitoring environment was quiet, but a tonal element was identified at NML4. It was not identified during monitoring but was identified during 1/3 octave analysis of the results (refer to Appendix 4).

Location	Start Time	Tonal*	$L_{Aeq,30}$	L_{AF90}	L_{AF10}	Comments
Daytime Monitoring – 14 December 2009						
NML1	09:37:59	0	62	56	65	Cold and frosty weather conditions, with a very faint breeze. The dominant noise during the monitoring period was the sound of local traffic movements and traffic movements on the nearby M6. 69 no. cars pass the monitoring location on the local R400 road route. A loud working tractor was recorded contributing to the background during the final three minuets of the monitoring period.
NML2	13:47:37	0	55	46	54	Cold and frosty weather conditions. On-site location. Quiet noise environment. Background noise consists of birdsong and intermittent traffic movements on both the M6 and the R400. Tipper trucks accessing the Derryarkin Sand & Gravel Quarry influenced monitoring.
NML3	11:26:03	0	46	39	49	Cold and frosty weather conditions. Dominant noise during monitoring was the sound of distant traffic movements on the M6, while traffic movements on the R400 also contributed, with 2 no. vehicles recorded passing during the monitoring period. Background noise consisted of birdsong.
NML4	12:09:55	0	59	37	63	The weather was very cold and still, with no breeze noted. Dominant noise during the monitoring was from passing vehicle movements. 51 no. movements recorded during the monitoring period. Background noise consists of birdsong, distant traffic movements sounds on the M6 and the sound of distant plant machinery operating, including intermittent reversing beacons.
NML5	12:49:25	0	54	43	57	Cold with a very slight breeze noted. Dominant noise consists of frequent engine movements sounds from a tractor in the farm yard adjacent to the monitoring location. Also includes intermittent reverse beacons. 7 no. trucks passed on the road during the monitoring period. Birdsong and cattle bellowing contributed to background noise levels. An overhead plane was also recorded during the monitoring period.
Night-time Monitoring – 22 February 2010						
NML1	00.34.48	0	53	32	54	Dark with very cold frosty conditions. Background noise is dominated by the sound of traffic movements from the nearby M6. No. 4 vehicle movements on the R400 during the monitoring period. Intermittent barking dogs also contributed to the background noise.
NML2	00.12.19	0	56	24	43	On-site location. Dark with very cold frosty conditions. Background noise is dominated by the sound of traffic movements from the nearby M6. No. 4 vehicle movements on the R400 were recorded during the monitoring period. Intermittent barking dogs contributed to the background noise.
NML3	22.25.26	0	37	22	39	Dark with very cold frosty conditions. Quiet with the constant sound of distant traffic from the M6 in the background, while traffic movements on the R400 also contributed, with No 1 vehicle recorded passing during the monitoring period.
NML4	23.24.51	+ 5 dB	52 + 5 = 57	19	39	Dark with very cold frosty conditions. Quiet with the constant sound of distant traffic from the M6 in the background and intermittent barking dogs. No. 1 vehicle passed during the monitoring period.
NML5	22.53.08	0	37	22	36	Dark with very cold frosty conditions. Quiet with the constant sound of distant traffic from the M6 in the background.

+/- 1 dB (reported to the nearest full decibel)

* Note Tonal assessed using ISO 1996-2:2007(E)

Impacts on the Existing Noise Environment

Construction phase

The construction phase of the project would have the potential to give rise to noise nuisance. In general, there are statutory criteria relating to the maximum permissible noise levels which may be generated by construction projects. Instead, the planning authority can control noise nuisance by imposing construction time limits on duration instead or by the setting of discretional noise limits in planning permission conditions.

The construction phase of this project will consist of site clearance activities, building and ancillary infrastructure construction. Construction noise will be temporary. The likely programme for construction of the site will be scheduled to run for 9 - 12 months. Normal construction working hours of between 08:00 to 20:00 hrs will apply and it is not anticipated that night-time construction works will be necessary on this project. Each phase of the construction will entail the use of different machinery and plant, across various locations on the site which will be deployed.

The exact construction methods and approach are not known at this stage it is not proposed to model the construction noise. However, it is anticipated that the impacts will be limited in duration and not significant at the noise sensitive locations, because of attenuation due to distance from the proposed site to the receptors.

Operational Phase

The noise sources associated with the operation of the development will include:

- Delivery of waste material to the facility
- Processing and bulking up of waste material in the waste reception and processing building
- Transportation of waste material off site
- Outdoor site operation including marshalling of vehicles and movement of trailers and skips

The operational phase potential noise impacts are predicted using the noise propagation model, thus enabling their potential impacts to be accessed against the criteria referred to earlier. Reference sound level data from each significant source on the site has been collected. The data has been sourced from literature, FTC file measurements from similar sites/equipment and potential equipment suppliers.

Source	Lw
	dB(A)
Waste Delivery Trucks *	96
Material Export Trucks *	96
Breakout at Door 1	95
Breakout at Door 2	95
Façade 1	79
Façade 2	79
Façade 3	79
Façade 4	79
Façade 5	79
Façade 6	79
Façade 7	79

* BS 5228-1:2009, Table C6;23.

An estimate has been made for the acoustic performance of the building shell, based on FTC file measurements and published data. While no noise attenuation berms or barriers were modelled, mitigation due to the doors of the waste reception and processing building being closed was assessed in Scenario 2.

Operational Modelling

The results of the noise modelling are presented in the following tables. The following figures show iso-plots for predicted noise contributions for each of the scenarios modelled. The contribution of the proposed facility as calculated in the model with the doors of waste reception and processing open (Scenario 1) and the doors closed (Scenario 2) and the corresponding predicted environmental noise level (PEL) is calculated from the logarithmic addition of the predicted contribution to the baseline. This model calculates a worst-case scenario.

Predicted Daytime Operational Noise Levels (Scenario 1)

Location	Background Baseline, L_{90} dB(A)	Specific Facility Contribution, dB(A)	Operational traffic prediction dB(A)	PEL, dB(A)
NML1	56	21	39	56
NML2 *	46	46	-	46
NML3	39	16	37	41
NML4	37	8	36	40
NML5	43	9	36	44

* NML2 is on-site

Predicted Operational Noise Levels (Scenario 2, Standard Operating Conditions)

Location	Background Baseline, L_{90} dB(A)	Specific Facility Contribution, dB(A)	Operational traffic prediction dB(A)	PEL, dB(A)
Daytime				
NML1	56	21	39	56
NML2*	46	46	-	46
NML3	39	16	37	41
NML4	37	7	36	39
NML5	43	8	36	44
Night-time				
NML1	32	21	39	40
NML2*	24	46	-	46
NML3	22	16	37	39
NML4	19	7	36	40
NML5	22	8	36	37

* NML2 is on-site

The table below summarises whether the proposed development will give rise to annoyance at the nearest sensitive receptors. Increases of 5 dB(A) over existing background noise levels are considered marginal with increases of greater than 10 dB(A) considered significant. The existing daytime and night-time background noise levels at the noise sensitive locations are all greater than the predicted noise levels from the proposed development. Therefore, it is predicted that the proposed development will not give rise to annoyance at these locations.

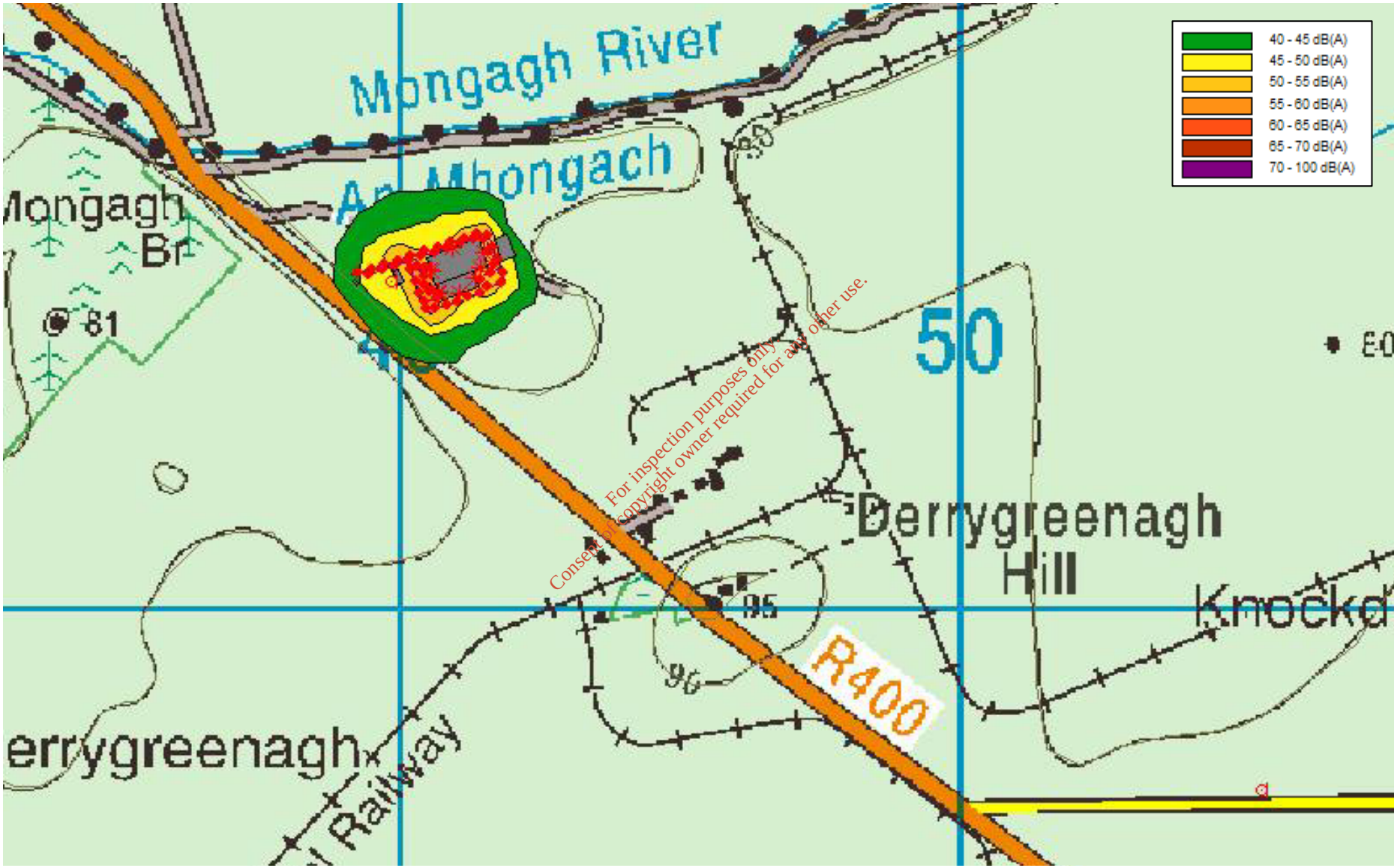
Impact on Background Noise Levels (Scenario 2)

Location	Difference between Daytime Background Baseline L_{90} dB(A) & Specific contribution	Predicted impact with no mitigation measures in place
NML1	- 35	No impact predicted
NML3	- 23	No impact predicted
NML4	- 30	No impact predicted
NML5	- 35	No impact predicted

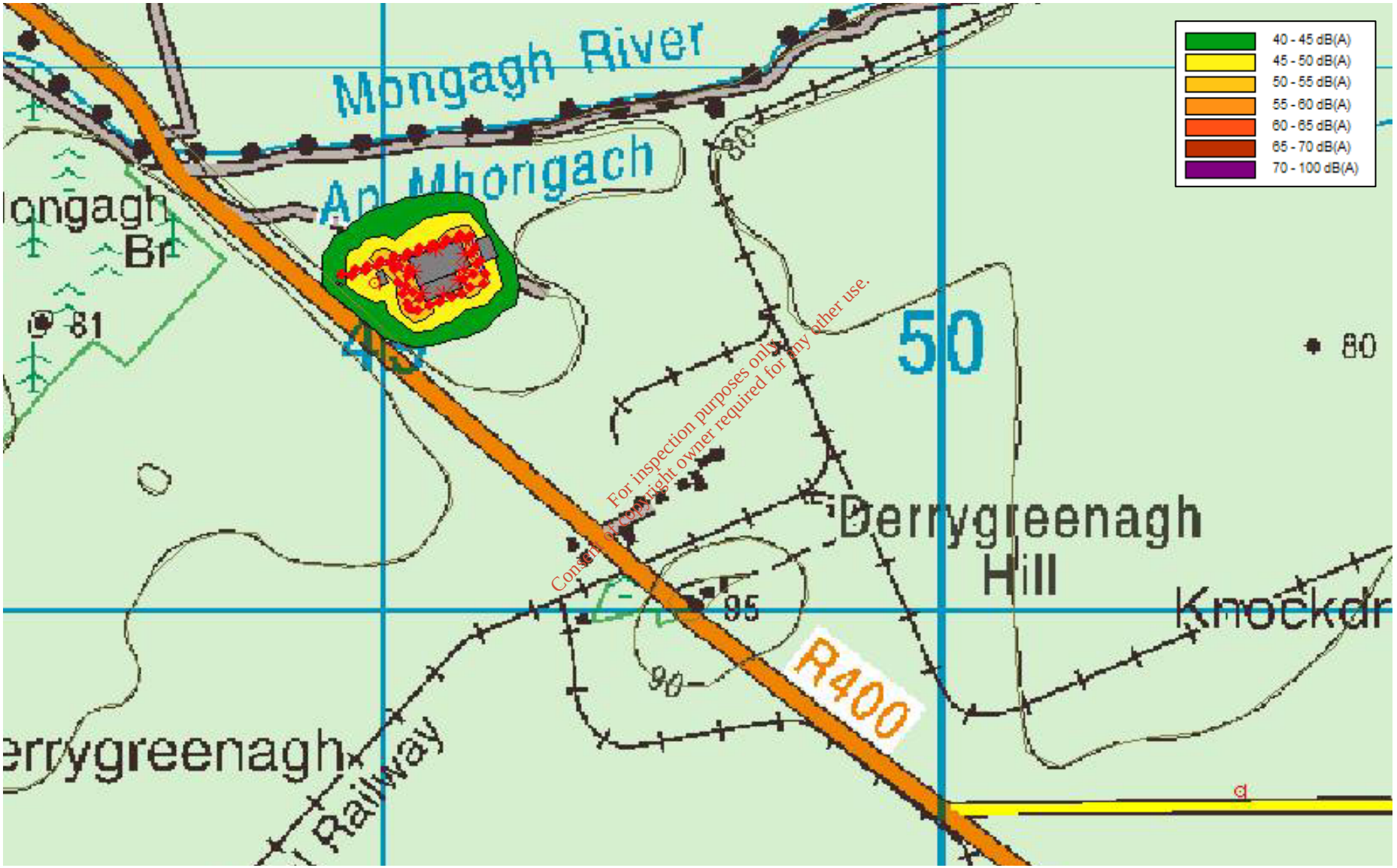
Location	Difference between Daytime Background Baseline L_{90} dB(A) & Specific contribution	Predicted impact with no mitigation measures in place
Location	Difference between Night-time Background Baseline L_{90} dB(A) & Specific contribution	Predicted impact with no mitigation measures in place
NML1	- 11	No impact predicted
NML3	- 6	No impact predicted
NML4	- 11	No impact predicted
NML5	- 13	No impact predicted

NML2 is on-site and not assessed for impact

Scenario 1



Scenario 2 (Standard Operating Conditions)



Mitigation Measures for Noise

Construction

During the construction phase of the development, the noise generated on the site will be managed so as to minimise potential impacts on any local noise sensitive location. All plant and equipment used during the construction phase will comply with noise regulations on outdoor plant and machinery.

The site operations will be conducted using best practice methods, for example, BS 5228:1997 Noise and Vibration Control on Construction and Open Sites, which are considered to be transferable and appropriate for construction projects in the Republic of Ireland. It also provides guidance in relation to acceptable noise levels during construction.

Measures will be put in place to control noise from construction plant, equipment and activities at source. Particularly noisy activities will be carefully planned and timed to cause the least impact. Noise monitoring will be carried out, as necessary, during the construction phase to ensure the site is operating without undue noise impact.

Construction noise will be temporary. The likely programme for construction of the site will be scheduled to run for 9 -12 months. Normal construction working hours of between 08:00 to 20:00 hrs will apply and it is not anticipated that night-time construction works will be necessary on this project. In addition, work on Sundays and Bank Holidays will be avoided, except for emergency situations.

Operations

The assessment of the predicted noise levels from the operation of the proposed facility showed that there will not be any significant noise impacts on the local environment. Nonetheless a number of preventive measures have been incorporated into the design and management of the proposed facility. These include:

- All waste handling operations at the site will occur indoors and doors will be closed
- Maintenance of plant and machinery will occur on a regular basis and will ensure correct operation of these items to manufacturers specifications
- All trucks delivering waste to the site will unload waste in the indoor waste intake area. These areas will have rapid closing roller shutter doors and standard operating procedure will be to operate with these doors closed
- The speed limit on the site for all vehicles will be a maximum limit of 25 kph.

Attachment E.6 Environmental Nuisance

Bird Control

It is not expected that bird control will be required at the proposed facility given the all processing operations will occur within an enclosed building.

Dust Control

Refer to Attachment E.1

Fire Control

Refer to Attachment D.1.o

Litter Control

Daily walkovers of the site will be carried out to monitor litter generation. Where any member of staff encounters litter, it will be a requirement for them to clear the litter. Litter is not expected to be an issues at the site as all processing operations will be carried out within an enclosed building.

Traffic Control

Refer to Attachment D.1.j

Vermin Control

A pest control management company will be employed at the facility to implement a full pest control regime.

Road Cleansing

A road sweeper will be contracted to carry out a road cleansing regime at the facility as and when required.

ATTACHMENT F – CONTROL & MONITORING

Proposed emission locations with relevant grid references are indicated in Drawing LW09-660-04_300-005. It should be noted that all locations are indicative and will be subject to agreement with the Agency.

Attachment F.1 Emissions and Abatement

To Atmosphere

As outlined in Attachment E.1, the waste reception and processing building will be operated under negative pressure and will incorporate a dust extraction system. The exact sizing and type of plant chosen is as yet undecided but will operate such that potential emissions as a result of operating the processing building under negative pressure will be minimised. Refer to Drawing LW09-660-04_300-005 for indicative location of dust extraction plant.

To Surface Water

As outlined in Attachment E.2, emissions to surface water will result from the surface water attenuation lagoon and from the proprietary wastewater treatment plant.

Surface water will pass through a hydrocarbon interceptor prior to entering the surface water attenuation lagoon. Discharge from the lagoon will be via a pipeline to the Mongagh River. Similarly, discharge from the proprietary wastewater treatment plant will be via pipeline to the Mongagah River with the likelihood being that two separate pipelines will run in the same trench towards the river i.e. the both surface water and foul water will discharge at the same location.

Monitoring points upstream and downstream of the discharge point are indicated in Drawing LW09-660-04_300-005. Specific hydrocarbon interceptor and proprietary wastewater treatment units are not decided upon as yet but will be chosen such that they satisfy the requirements and standards specified by the Agency.

Attachment F.2 – F.9 Monitoring & Sampling Points

The parameters to be monitored at the site include groundwater, noise, air quality and surface water quality. Drawing LW09-660-04_300-005 indicates the locations of the proposed emission and monitoring points.

Environmental monitoring will be undertaken either by facility staff or a competent environmental scientist(s) contracted by the applicant. This person(s) will be responsible for ensuring that sampling is undertaken in compliance with EPA protocols. The results and interpretative report will be prepared on a basis specified by the licence for the facility and submitted in a manner suitable for presentation to the EPA.

Sampling protocols including Standard Operating Procedures (SOP) and QA/QC data will be supplied to the Agency as part of the monitoring programme. Where laboratories are used for analysis, the methods, SOPs, Chain of Custody Information and QA/QC information will be submitted to the EPA as part of the reporting procedure.

Attachment F.2 Air

Monitoring of air emission will occur at the locations identified in Drawing LW09-660-04_300-005 at a frequency and by a means specified by the Agency.

Attachment F.3 Surface Water

Monitoring of surface water emissions will occur at the locations identified in Drawing LW09-660-04_300-005 at a frequency and by a means specified by the Agency.

Attachment F.4 Sewer Discharge

There will be no emissions to sewer hence no monitoring will occur.

Attachment F.5 Groundwater

Monitoring of groundwater quality will be undertaken at the location of the groundwater borehole that will supply the site, to be agreed with the Agency at a frequency and by a means specified by the Agency.

Attachment F.6 Noise

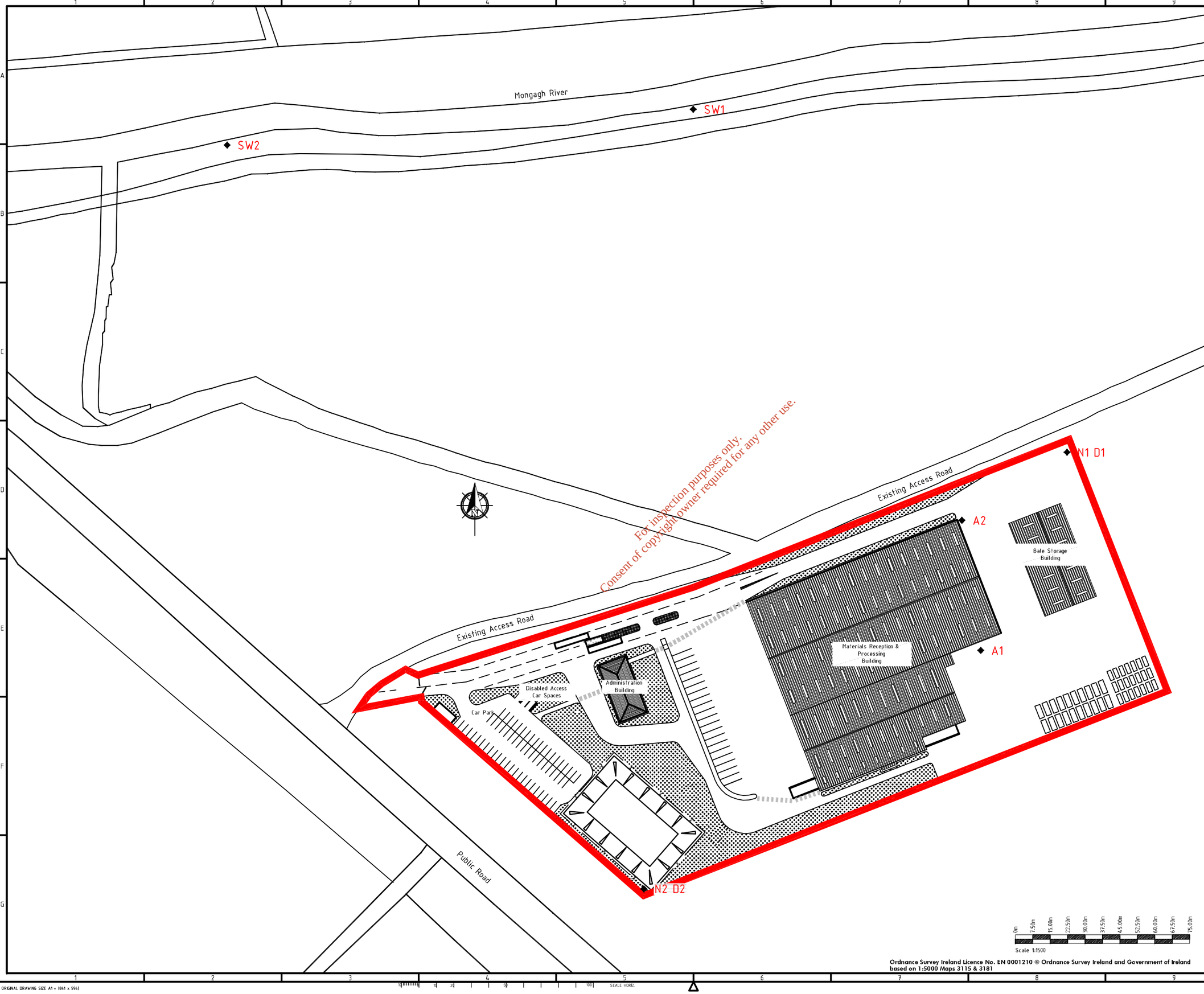
Monitoring of noise emissions will occur at the locations identified in Drawing LW09-660-04_300-005 at a frequency and by a means specified by the Agency.

Attachment F7 Meteorological Data

No monitoring of meteorological data will occur at the facility. It is proposed that meteorological data sourced at the Mullingar synoptic station would be representative at weather conditions in the vicinity of the facility, if so required.

Attachments F.8 & F.9 Leachate & Landfill Gas

Not Applicable.



NOT FOR CONSTRUCTION UNLESS SPECIFICALLY STATED OTHERWISE

Emission Locations

A1, A2 - Air Emission Points (indicative)

Monitoring Locations

D1, D2 - Dust Monitoring Locations

N1, N2 - Noise Monitoring Locations

GW1 - To Be Conformed

SW1, SW2 - Surface Water Monitoring Points

Grid Reference Of Emission & Monitoring Locations (Indicative Only)

A1:	E: 249148	N: 238629
A2:	E: 249140	N: 238685
N1, D1:	E: 249185	N: 238714
N2, D2:	E: 249003	N: 238767
SW1:	E: 249024	N: 238862
SW2:	E: 248824	N: 238846

Rev.	Drawn	Chk'd	Appr'd		
A				Cork 25.02.10	ISSUE FOR WASTE LICENSE APP
				Rev Origin / Date	Description

Revision History: A

Name of Client

Bord na Mona PLC

Name of Job

Drumman Project

Title of Drawing

Proposed Emission and Monitoring Locations

Scales Used 1:1500

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Rev. A

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ATTACHMENT G – RESOURCE USE AND ENERGY EFFICIENCY

Attachment G.1 Raw Materials and Product

The following table presents estimates for the raw materials and energy which may be consumed at the facility on an annual basis. The figures presented are best estimates based on data from similar facilities scaled to the throughput of the proposed facility.

Resource	Quantities
Diesel Oil	140,000 Litres
Electricity	575,000 kWh

Water usage onsite is difficult as ascertain at this juncture. However, it is proposed that rainwater harvesting be utilised onsite thus minimising the requirement for water abstraction from a bored well. In addition, devices such as water conserving toilets etc. will be deployed in the site welfare facilities.

Attachment G.2 Energy Efficiency

The applicant will carry out an energy efficiency audit annually at the facility. The applicant realises the benefit of energy efficiency measures and proposes to adopt and incorporate measures such as speed inverters on plant where possible, timed light switches, energy efficiency lights, maximising natural lighting in buildings and solar cells in the facility design.

ATTACHMENT H – MATERIALS HANDLING

Attachment H.2 Waste Acceptance Procedures

Attachment D.2 details the waste acceptance procedures for the facility.

Attachment H.3 Waste Handling

Attachment D.2 details the waste handling procedures for the facility.

Attachment H.4 Waste Arisings

Small quantities of municipal waste will be generated in the canteen and offices. This waste will be processed through the provisions in site operations. Any residual waste generated will be sent off-site to an appropriate licenced facility.

ATTACHMENT I – EXISTING ENVIRONMENT & IMPACT OF THE ACTIVITY

Attachment I.1 – Assessment of Atmospheric Emissions

A detailed assessment of the existing atmospheric environment is presented in Attachment E.1.

Attachment I.2 – Assessment of impacts of surface water discharges on the receiving waters

A detailed assessment of existing surface water quality is presented in Attachment E.2.

Attachment I.3 – Assessment of Impact on receiving sewer

Not Applicable

Attachment I.4 – Assessment of impact of groundwater and soils

A detailed assessment of the existing soils, geology and hydrogeology and the potential impact on these from the proposed development is presented in the accompanying environmental impact with relevant information reproduced here.

Existing Soils and Geology

The main soil associations in northern Offaly belong to the 'Flat to Undulating Lowland' broad physiographic division. The main Quaternary sediments identified in this area of Offaly are cutover basin peat deposits. Fieldwork confirmed the presence of peat at all areas of the site to depths of up to 3 m. The average depth of peat encountered was about 1.3 m, possibly as a result of peat harvesting over the site. The peat encountered within the trial pits typically comprised brown, wet, and cohesive to fibrous peat.

Immediately underlying the peat layer is generally grey silty, sandy, cobbly gravel, which grades in places to soft, sandy, gravelly silt, particularly towards the north east part of the site. This granular soil has a thickness of at least 3 m over the majority of the site.

The 1:100,000 scale bedrock geology maps show that Lower Carboniferous (Upper Dinantian) rock underlies the site. The rock comprises Lucan Formation dark impure (muddy) limestone and shale usually referred to as 'Calp'.

Existing Hydrogeology

The hydrogeological characteristics of the region are strongly influenced by the underlying rock type. The Lucan Formation underlying the site is part of the 'Carboniferous Limestone lowlands' which represents one of the six main hydrogeological units within the Offaly-Galway region. The GSI classifies the Lucan Formation as a 'Locally Important Aquifer (LI) which is considered to be moderately productive only in localised zones.

Groundwater development within the Lucan Formation is often not particularly successful with low yields and problems with iron and manganese, and sometimes hydrogen sulphide. Good yields will generally only be obtained within fault zones and/or dolomitisation at depth. Although the upper, more permeable layer might provide sustainable enough supplies for larger wells, it will often be poorer quality than the water within the deeper permeable horizons.

The bedrock in this area is covered by Quaternary sediments of variable thickness, structure and composition. The low permeability material (clay and till) protects the underlying bedrock aquifers while the high permeability material (sand and gravel) allow recharge of the aquifers and may themselves also form aquifers where they are sufficiently thick.

The silts within parts of the site area are probably intermediate between these extremes. Acting as aquicludes, they will restrict movement of water to the bedrock, but are unlikely to be of sufficient permeability to form aquifers themselves although the interbedded gravels may locally be used as water supplies.

Based on the findings from the trial pit excavations and probes, the assessed vulnerability for the site is high, based on the thickness and permeability of the strata estimated from the fieldwork. The resource protection zone associated with the aquifer class and vulnerability is therefore classified as LI/H (Locally Important aquifer with High vulnerability).

Potential Impacts on Soils, Geology and Hydrogeology

Excavation of peat over the entire development area will be required during construction. The average depth of peat covering the development area is approximately 0.65 m; hence a total peat excavation volume of approximately 17,500 m^3 will be required. Following removal of the peat, the site levels will be raised above the existing ground levels by importing granular fill from the nearby quarries. The final site level will be determined during the detailed design phase.

The importation of granular fill will require excavation of granular fill from local quarries or borrow pits, and other products in the form of concrete or other construction related products. This will have a permanent impact on the source quarries or borrow pits.

It is possible that deep piled foundations may be required at some locations which would involve less soil excavation. While the impact of piles on near-surface soils would be less, any impact would extend to a greater depth. Given the scale of the development relative to the size of the site, this is anticipated to have a minor, permanent impact. In addition, bored piles, if utilised, would also require disposal of soil and possibly some bedrock.

The construction of roads and foundations also imposes hydrological impacts in the form of modifying the natural seepage from upslope of the road, thus depriving the downslope soil of its natural supply of water, leading to drying of the soil surface. Due to the flat-lying nature of the Drumman site, and the drainage design proposed, these effects will be minimal.

The potential environmental impact of the use of peat berms is primarily related to the risk of oxidisation of the peat and the release of sediment into surface waters. The estimated volume of peat excavated from the development area will be about 17,500 m^3. It is proposed to construct a landscaped berm of maximum height 1 m over an area of approximately 18,900 m^2 (adopting 1:4 side slopes). The potential hydrological impacts are discussed further in the hydrology chapter of this document, and mitigated through appropriate drainage techniques.

Removal of peat and subsoils can also result in exposure of the underlying rock to sources of contamination. Chemical pollution could occur as a result of spillage or leakage of chemicals, runoff from vehicle washing facilities, unset concrete, storage of fuels or refuelling activities etc. Chemical pollutants can enter groundwater supplies and have implications for damage to ecology and local water supplies.

Parts of the site have been drained by manmade drainage channels on the site. The formation of new site roads and drains will involve removal of linear areas of the peat and blocking or removal of existing drains.

The excavation of peat and subsoils is a permanent impact that, without mitigation, could alter the existing hydrogeological balance of the site. Shallow foundations are likely to be used for the buildings after removal of peat and any soft mineral soils. Removal of this cover will expose the underlying soils to erosion and may result in sediment run-off. Groundwater drawdown will occur as a result of pumping which may be required during construction. However, levels will be allowed to rise to current levels after construction is complete.

Some drawdown could also occur adjacent to the sidewalls of the internal haul road (typically within 5 m); however much less significant drawdowns will occur away from the track drainage. Although this is a permanent impact for permanent roads, it is considered to be relatively minor as the depth of peat excavation is low (typically less than 1.5 m).

Excavation below the water table could be required where pad or strip foundations are constructed. In this case, temporary dewatering or lowering of the water table could be required in the form of sheet piling, sump pumping, or possibly well pointing in extreme cases. This will be a temporary and relatively minor impact on hydrogeology, which will result in drawdown of the water table around the foundations and to a horizontal distance of typically 10 – 20 m depending on the depth of the excavation and the permeability of the surrounding soils. Pumping may also result in sediment release into drains and watercourses.

After excavation, the water table adjacent to the excavations will return to its former level, although piled foundations extending below the water table will have some effect on the wider aquifer flow patterns within the overburden. The magnitude of this impact will depend on the size and density distribution of the piles installed. Given the moderately high permeability of the overburden, the effect is considered to be a minor, permanent impact.

Where dewatering of the site is required for excavations, this could also have a potential impact on nearby groundwater wells and could, without mitigation, result in sedimentation or potential contamination of the groundwater.

Should piled foundations be required, the impact on the hydrogeological regime is likely to be reduced, particularly with regard to water table drawdown and flow patterns. However, the piles are likely to extend to a greater depth than would pad foundations. This could have an impact on aquifers within both overburden and bedrock. There is the possibility that piling could create a preferential vertical pathway for movement of water or contaminants down to the underlying aquifer. This effect would be greatest where piles extend through low permeability strata and into a confined bedrock aquifer, however it appears that the strata underlying the peat is largely granular in nature and hence this impact would be reduced.

Attachment I.5 – Ground and/or groundwater contamination

As per Attachment I.4

Attachment I.6 – Noise Impacts

A detailed assessment of baseline noise condition and potential noise impact is presented in Attachment E.5.

Attachment I.7 – Assessment of Ecological Impacts and Mitigation Measures

A detailed assessment of the existing ecology and the potential impact from the proposed development is presented in the accompanying environmental impact with relevant information reproduced here.

Existing Ecology

The proposed development is located within 10 km of nine designated sites. A total of four proposed Natural Heritage Areas (pNHAs), three designated NHAs and two Special Areas of Conservation (SACs) occur within 10 km of the site. The proposed development site does not lie within or adjacent to any site that has been designated for nature conservation. There are no designated sites within 5 km of the development site, with the nearest designated site being Milltownpass Bog NHA, some 5.51 km to the north. A total of three habitat types were identified within the Drumman site boundary. The habitats recorded (as per Fossit) are Cutover Bog (PB4), Bog Woodland (WN7), Recolonising Bare Ground (ED3). A total of 41 plant species were recorded during the field surveys. This is not an exhaustive list of the plant species that occur on the site as the survey did not take place at an optimal time of the year for a botanical survey. Four protected floral species have previously been recorded from within the same 10 km grid square as the development site (N53). These species are Blue Fleabane, *Erigeron acer*, Red Hemp-nettle, *Galeopsis angustifolia*, Bog-rosemary, *Andromeda polifolia* and Cowslip, *Primula veris*

None of these species were recorded during the botanical survey of the site.

A species list of all birds recorded on site was compiled. In total, 17 bird species were recorded on or within the vicinity of the site. No formal bird surveys were undertaken as the field visit was carried out outside of the normal bird breeding season.

One *Red-listed* species of high conservation concern (Golden Plover) and 4 *Amber-listed* species of medium conservation concern (Snipe, Teal, Whooper Swan and Woodcock) were recorded during the site walkover (Lynas *et al.,* 2007). The Golden Plover and Whooper Swan are also listed as an Annex I species of the E.U. Birds Directive. Golden Plover were heard calling off-site whilst the Whooper Swans were seen in a field lying to the north of the River Mongagh.

The site in general has limited value for birds with the areas of bog woodland providing some nesting and feeding sites. The areas of recolonising bare ground will provide seed producing plants that will be used by small birds such as finches for late summer and winter feeding. The cutover bog area provides only limited feeding sites for birds such as Snipe that would use these areas in the winter.

A total of three mammal species were recorded on, or in the vicinity of, the site during the site walkover in January 2010. Rabbit, *Oryctolagus cuniculus*, burrows were found in the roadside bank with numerous mammal tracks, thought to be Rabbit, found along the river bank and entering banks of gorse bushes. Irish Hare, *Lepus timidus hibernicus*, was thought to be common within the site boundaries with numerous sightings of individual hares and plenty of droppings. Plants such as Soft Rush and some of the tree seedlings also showed signs of being grazed by hares. The only sign of Fox *Vulpes vulpes* was the presence of a Fox scent along the northern site boundary but it is highly likely that Foxes will forage across the site.

No evidence of Otter, *Lutra lutra,* was found on the site or along the nearby Mongagh River. It is not considered likely that the Mongagh River is regularly used by Otter due to the almost stagnant water flow, apparent high levels of siltation and steep highly modified river banks in the vicinity of the site. It is also highly unlikely that Badgers, *Meles meles*, use the site due to the extensive water-logging on the site and limited availability of food.

A bat survey was not undertaken and no signs of bats were recorded during the site walkover. The wet habitats present on site do provide foraging habitats for bats but there is a lack of suitable roosting sites within the site. Some of the mature trees present in the treeline along the adjacent road may provide roost sites for bats.

No other species were recorded on the site. It is likely that the Common Frog, *Rana tempraria* occurs on the site due to the abundance of wet habitats. The wet habitats are also likely to support damsel and dragonfly species. Viviparous Lizard *Zootoca vivipara***,** is also likely to occur on the site given the conditions present.

The Common Frog and Viviparous Lizard are protected by the Wildlife Act (1976 and Amendment 2000). Common Frog is also listed as a species of International Importance in the Irish Red Data Book (Whilde 1993) and as species of community interest under Annex V of the EU Habitats Directive.

Using the NRA (2006) guidelines for site evaluation, this site is given an E Rating – Low value, locally important. Appendix 6 shows the NRA criteria for rating sites and it can be seen that an E Rated site consists of artificial or highly modified habitats with low species diversity and low wildlife value.

Potential Impact on Ecology

Construction of the development will lead to some permanent loss of habitat. The footprint of the proposed development, once constructed, will be confined to within the development site boundary. Construction will involve the removal of the trees within a large area of the Bog Woodland habitat. Peat spoil arising during construction will be used to create a berm on the cutover bog habitat within the wider Drumman site boundary. This will lead to some temporary loss of vegetation but the areas of bare spoil will be re-colonised with similar vegetation as already exists on site and this impact will be of a temporary nature. Potential temporary impacts may also occur during construction through temporary storage of spoil, construction materials etc.

Removal of areas of habitat will inevitably lead to removal of vegetation. The plant species that were recorded during the field surveys are all locally common and no rare or protected species of plant were noted. Mitigation measures include a pre-construction botanical survey at an appropriate time of year to determine whether any protected plants are present on the site.

The construction, operational and decommissioning phases of the project all give rise to potential impacts on the water quality of the Mongagh River through contamination by silts, suspended solids and other contaminants (e.g. fuels, oil). Mitigation measures are proposed to prevent any impacts on the water quality within the Mongagh River.

Removal of areas of Bog woodland will lead to the loss of nesting and foraging habitat for birds. Removal of the trees outside the birds breeding season will reduce any direct impacts on nesting birds. Spreading of the construction spoil in the wider Drumman site will also lead to loss of foraging habitat, particularly if low-lying wet areas are infilled. Large areas of similar habitat are present in the surrounding wider countryside, consequently impacts on bird populations will be very localised.

The diversity and abundance of mammals on the site appears to be relatively low. Irish Hare was the most commonly observed mammal species and is likely to be widespread throughout the wider landscape. Removal of the Bog Woodland habitat will remove areas of cover that Irish Hares would use.

The Bog Woodland and low-lying wet areas also provide potential foraging areas for bats and loss of these habitats could have local impacts on bat populations.

During the construction phase of the development there may be a certain amount of disturbance to mammalian fauna occurring on the site, however this will be temporary in duration and given the habitats present in the wider environment, affected mammals will be able to move to other locations in the wider area. It is highly unlikely that there will be any residual long term impacts on the mammal communities occurring at the site.

As mentioned above, this site has been given a Rating of E – low value, locally important, using the NRA (2006) guidelines for site evaluation (Appendix 6). The proposed development will have a permanent impact on a large part of the site. Therefore, using the NRA (2006) recommended criteria for assessing impact significance, the proposed development will have a Minor Negative impact on the site.

ATTACHMENT J – ACCIDENT PREVENTION & EMERGENCY RESPONSE

Attachment J.1 – Accident Prevention and Emergency Response

Draft Accident Prevention and Emergency Response procedures are presented in Attachment J.1.1. These procedures will be incorporated into the Environmental Management System that will be developed for the site, in agreement with the Agency.

The draft procedures presented are:

- ERP 1 Emergency Response Procedure
- ERP 2 Spill Clean Up Procedure
- ERP 3 General Fire/Explosion Procedure
- ERP 4 Flooding Procedure
- ERP 5 Malicious Damage Procedure
- ERP 6 Unforeseen Emergency Procedure

Public liability insurance to the value of €13 million is in place through Bord na Móna PLC which also includes the operations of Advanced Environmental Solutions (Ireland) Ltd. A copy of the public liability insurance is included in Attachment J.1.1

Attachment J.1.1

Draft Emergency Response Procedures & Public Liability Certificate

ERP 1 Emergency Response Procedure

1.0 Purpose

The purpose of this programme is to define appropriate procedures in response to potential emergency situations occurring at this site including environmental accidents and/or emergencies.

2.0 Scope

The scope of this procedure is the application of the Environmental Emergency Plan:

Document No.	Description	Revision No.
ERP 2.0	Spill Clean Up Procedure	2
ERP 3.0	General Fire/Explosion Procedure	2
ERP 4.0	Internal/External Flooding Procedure	2
ERP 5.0	Malicious Damage Procedure	2
ERP 6.0	Unforeseen Emergency Procedure	2

3.0 Definitions

Environmental Emergency Response Team
The Facility Manager, the Supervisors and any other person or persons designated by the aforementioned individual for membership on the Emergency Response Team.

4.0 Procedure

4.1 Should an emergency situation occur, procedures from the Environmental Emergency Plan, which details each emergency situation and proposed response should the emergency occur, are implemented

4.2 Each Environmental Response Procedure is completed with reference to potential emergency situations. The response documented within the Environmental Emergency Reponses Procedure reflects the likelihood of the situation occurring and the associated potential environmental impacts of this occurrence.

4.3 On a weekly basis, the Facility Manager or designee checks all emergency response equipment to ensure that it is provided in

agreed quantities and in suitable working order. Any discrepancies shall be remedied at once.

4.4 On an annual basis, and at any other time deemed necessary, the Facility Manager in conjunction with the Environmental Manager reviews the documented response procedures for associated emergency situation. Additional Procedures may be prepared as identified by environmental reviews/audits, environmental compliance monitoring reports, personnel during routine working hours or other communications which bring potential emergency situations to the attention of the Management.

4.5 Following an emergency, the Facility Manager, shall record details of the incident. Following a comprehensive investigation into the source of the emergency situation, a corrective action shall be formulated by the Facility Manager and signed off on the *Environmental Corrective and Preventive Action Form (EPF1.1).*

4.6 In the event of the following incidents, records shall be maintained and the Facility Manager shall notify the relevant authority by telephone and facsimile as soon as possible:

- Any nuisance caused by the activities carried out at the facility
- Any emission which results in the contravention of any relevant standard, including any standard for an environmental medium, or any relevant emission limit value, prescribed under any relevant enactment
- Any emission which does not comply with the requirements of the Waste Licence
- Any trigger level specified in the Waste Licence which is attained or exceeded
- Any indication that environmental pollution has or may have, taken place
- Any occurrence with the potential for environmental pollution, and,
- Any emission.

4.7 When notifying the relevant authority, as part of the notification, the date and time of the incident, details of the occurrence and the steps taken to minimise the emissions and to avoid a recurrence shall be included. The written record should be submitted to the relevant authority as soon as practicable but within 5 working days after the occurrence of the incident.

4.8 Should any further actions be taken after the date of written notification, as a result of any incident occurring, a written report shall be forwarded of those actions to the Agency as soon as practicable and no later than 10 days after the initiation of those actions

5.0 Responsibility

The Facility Manager is responsible for the implementation of this procedure and also for selecting and implementing the appropriate procedure from the Environmental Emergency Plan in the event or an emergency of incident on-site.

Following an emergency or incident on-site, the Facility Manager is responsible for notifying relevant authority and, for compiling a written report of the incident.

ERP 2 Spill clean up Procedure

1.0 Purpose

This procedure details the steps to be taken when dealing with a chemical substance spillage on site. It is required in order to:

- Protect Employees
- Protect the Environment
- Prevent Fugitive Emissions

2.0 Scope

This procedure should be followed for all small, large and massive spills, which may occur.

Definitions:

Small Spill:	Less than 5 litres
Large Spill:	Greater than 5 litres and less than 250 litres
Massive Spill:	Greater than 250 litres

3.0 Procedure

3.1 Ensure that hazardous materials are handled (loaded, unloaded and moved) by a competent person using the correct equipment and appropriate protective clothing. Appropriate precautions should be taken at all times to minimise the risk of accidental spillage.

3.2 In the event of a spillage occurring, the Facility Manager shall initially investigate the following issues:

- How long has it been since the incident occurred?
- Consult the relevant data sheets (Material Safety Data Sheet or otherwise) for the method of spill containment and fire control of the affected material.
- Contact the relevant emergency response number (local fire service, police, hospital and Environmental Protection Agency telephone numbers are posted on the environmental notice board in the staff canteen and are also available at the reception) and any external emergency response help.
- Locate the nearest fire suppression system as appropriate; (Dry powder extinguishers for ABC fires (wood, paper, textiles, liquid fuels and gases) Foam extinguishers for AB fires (wood, paper, textiles and liquid fuels) Carbon Dioxide (liquid fuel fires and electrical equipment).
- Identify the location of the nearest First Aid station

- Note the wind direction and any possible sources of ignition i.e. naked lights, machinery, electrical fittings and combustible material and remove them from the area.
- Evacuate the area (for large spills if necessary)
- The Facility Manager or any other designated person from the Emergency Response Team shall ensure that all personnel are evacuated in a calm, efficient manner. Staff should be instructed to walk briskly to their designated evacuation locations.
- If flammable material is involved in the spill, isolate equipment and materials that may be affected
- If deemed necessary, the Facility Manager or any other designated person from the Emergency Response Team shall instruct for the appropriate emergency services to be contacted. A list of telephone numbers for all emergency services are posted on the environmental notice board in the staff canteen and are also available at the main reception.

3.3 The spillage must be contained using absorbent material, socks, booms or sandbags to create a secure dike. These are located in the high risk areas of spillage throughout the facility. The Facility Manager or any other designated person from the Emergency Response Team shall ensure that all appropriate personal protective equipment is worn (as detailed in the Material Safety Data Sheet for the spilled material [s]).

3.4 If the spillage emanated from a drum, position the drum so that the ruptured section is in an upwards direction, thereby preventing a further leakage.

3.5 Once the spill has been contained the liquid shall either be pumped, or removed into a barrel using non-spark shovels and labelled appropriately (contents, name and date).

3.6 In the event of a spillage that contaminates the foul water holding chambers, the collected foul water will not be tankered off-site to the wastewater treatment plant without the consultation of the operator by the Facility Manager. Records of such consultant will be recorded and held with the *Environmental Corrective and Preventive Action Form (EPF1.1)* on file in the office.

3.7 Clean-up operation.

- Use non-sparking shovels and brushes to sweep the spilled material into drums.
- Start on the outside and work in towards the centre of the spill
- Do not mix different types of waste
- Drum the waste and seal the container or bag and double bag.

- Label the waste with the destination name, appropriate hazard label and name of waste giving as much information as possible on contents, plus concentrations of constituents, etc.
- If the spill occurred due to a damaged drum, place the ruptured drum into a salvage drum container, until disposal is arranged.
- Decontaminate personnel by using the washing facilities.

3.8 Any waste material resulting from a spillage clean-up shall be dispatched to an appropriate facility for disposal and/or recovery under the supervision of the Facility Manager.

3.9 Following an emergency, the Facility Manager shall record details of incident. Following a comprehensive investigation into the source of the emergency situation, a corrective action shall be formulated by the Facility Manager and signed off on the *Environmental Corrective and Preventive Action Form EPF1.1*

4.0 Responsibility

General staff and contractors are responsible for being aware of the procedure and their responsibilities/requirements/obligations.

The Facility Manager is responsible for making employees aware of their responsibilities and obligations should a spillage occur.

ERP 3 General Fire/Explosion Procedure

1.0 Purpose

A procedure to deal with fire/explosion emergencies is required for the following reasons:

- To protect Employees
- To protect the Environment
- To prevent Fugitive emissions

2.0 Scope

This procedure should be followed in the event of a fire or explosion at this site.

3.0 Procedure

3.1 Employees shall only attempt to fight a fire if safe to do so. If an employee feels that they cannot tackle a fire safely and effectively, **EVACUATION OF ALL PERSONNEL IS THE PRIMARY PRIORITY.**

3.2 The Facility Manager works to evacuate the area in a calm, efficient manner. All staff and contractors shall be instructed to walk briskly to the designated evacuation location point.

3.3 In the event of a fire/explosion occurring, the Facility Manger shall complete a roll call to account for all employees and contractors that may be present on-site.

3.4 The Facility Manager shall identify the location of the fire/explosion through dialogue with the individual who discovered the fire and shall take one of the following actions:

- Determine whether the fire can be **SAFELY** isolated utilising the available fire fighting equipment.
- If the fire is not controlled with the fire fighting equipment available, the local fire brigade is notified immediately. Local fire, police and hospital numbers are posted on the environmental notice board in the staff canteen and are also available in the main reception.

3.5 Personnel shall not re-enter the building unless the Facility Manager deems it safe to do so.

3.6 Once the fire has been extinguished or the explosion controlled, the Facility Manager, shall complete a clean up operation as per EPR 2.0 using the available resources

3.7 All fire-affected material is checked thoroughly in order to ensure it is quenched. If the affected material is considered hazardous, it is stored in a container and collected as soon as possible by a certified hazardous waste disposal contractor.

3.8 The Facility Manager will contact the relevant authority; in the event of any incident on site paying due regard to conditions specific to the Waste Licence 104-1.

3.9 Following an emergency, the Facility Manager, or other designated responsible person shall record details of the incident. Following a comprehensive investigation into the source of the emergency situation , a corrective action shall be formulated by the Facility Manager and signed off on the *Environmental Corrective and Preventive Action From (EPF1.1)*

4.0 Responsibility

General staff and contractors are responsible for being aware of the procedure and their responsibilities/requirements/obligations in relation to the General Fire/Explosion procedure.

The Facility Manager is responsible for making employees aware of their responsibilities and obligations should a fire/explosion occur.

ERP 4 Flooding Procedure

1.0 Purpose

This procedure is required in order to:

- Minimise environmental damage from a flooding incident.
- Minimise damage to property or materials on site.

2.0 Scope

This procedure should be followed in the event of a flooding incident at this site.

3.0 Procedure

3.1 Locate source of flooding and, if possible and safe to do so, shut it off.

3.2 Remove containers of environmental hazardous material to a safe location to prevent their entry to the drainage system. As per *EPR2.0* ensure all hazardous materials are handled (loaded, unloaded and moved) by a competent person using the correct equipment and appropriate protective clothing. Appropriate precautions should be taken at all times to minimise the risk of accidental spillage.

3.3 The Facility Manager shall contact the relevant emergency response number (local fire service, police, hospital and Environmental Protection Agency telephone numbers are posted on the environmental notice board in the staff canteen and also in the Main Reception Area) and any external emergency response help if he/she feels that the incident cannot be dealt with safely utilising on-site resources.

3.4 Once the source of the flooding has been eliminated, the Facility Manager will commence the mop up operation, if required as per *EPR2.0*.

3.5 The Facility Manager, or other designated responsible person, will contact the relevant authority in the event of any incident on-site paying due regard to specific conditions of the Waste Licence 104-1.

3.6 Following an emergency, the Facility Manager shall record details of the incident. Following a comprehensive investigation into the source of the emergency situation, a corrective action shall be

formulated by the Facility Manager and signed off on the *Environmental Corrective and Preventive Action EPF1.1)*

4.0 Responsibility

General staff and contractors are responsible for being aware of the Flooding Procedure and their responsibilities / requirements / obligations.

The Facility Manager is responsible for making employees aware of their responsibilities and obligations should a flooding incident occur.

The Facility Manager is responsible for recording the details of any incident that occurs and ensuring that an effective corrective action is implemented.

ERP 5 Malicious Damage Procedure

1.0 Purpose

This procedure is required in order to:

- Monitor malicious damage
- Prevent malicious damage.

2.0 Scope

This procedure should be followed in the event of a malicious damage being inflicted at this site.

3.0 Procedure

3.1 Where any occurrence of malicious damage is noted or where persons are observed causing malicious damaged the Facility Manager is informed.

3.2 Where malicious damage results in a significant environmental impact, or a potential significant environmental impact the Facility Manager is advised who then undertake to minimise and repair the damage caused.

3.3 Persons observed causing malicious damage are subjected to internal disciplinary action. The Facility Manager, will report external persons to the Gardai.

3.4 The Facility Manager will contact relevant authority in the event of any incident on site paying due regard to the conditions set out in the Waste Licence 104-1.

3.5 Following an emergency, the Facility Manager shall record details of the incident. Following a comprehensive investigation into the source of the emergency situation, a corrective action shall be formulated by the Facility Manager and signed off on the *Environmental Corrective and Preventive Action EPF1.1)*

4.0 Responsibility

General staff and contractors. are responsible for being aware of the Malicious Damage Procedure and their responsibilities / requirements / obligations. The Facility Manager is responsible for reporting any external persons found causing malicious damage, to the Gardai.

ERP 6 Unforeseen Emergency Procedure

1.0 Purpose

To outline the procedure to be adhered to in the event of an unforeseen emergency.

2.0 Scope

This procedure should be followed in the event of an unforeseen emergency occurring at this site.

3.0 Procedure

3.1 Following the occurrence of an incident requiring emergency action, the observant shall contact the most senior representative of management on-site.

3.2 Should it be deemed necessary by the Facility Manager the transfer station shall be evacuated and the emergency services contacted (list of local fire, policy and hospital telephone numbers are posted on the environmental noticeboard in the staff canteen and are also available at the main reception.

3.3 There shall be no re-entry permitted on site, until clearance is provided by a representative of the emergency services AND the most senior representative of management on-site.

3.4 Should the incident be determined to be capable of being addressed in-house, under the guidance of the most senior representative of management on-site, the Environmental Emergency Response Team shall be mobilised paying due regard to the appropriate emergency response procedure (ERP 2.0, 3.0, 4.0, 5.0.)

3.5 The Facility Manager is responsible for informing the relevant authority if hazardous chemicals or firewater have infiltrated the drainage network.

3.6 Following an emergency, the Facility Manager shall record details of the incident. Following a comprehensive investigation into the source of the emergency situation, a corrective action shall be formulated by the Facility Manager and signed off on the *Environmental Corrective and Preventive Action EPF1.1)*

4.0 Responsibility

General staff and contractors are responsible for being aware of this procedure and their responsibilities / requirements / obligations.

Training and awareness will be provided on an annual basis as a minimum.

The Facility Manager is responsible for informing the relevant authority should any hazardous chemicals or firewater have infiltrated the drainage network.

Following the emergency, the Facility Manager is responsible for ensuring that the incident has been documented and, that effective corrective action has been implemented.

DRAFT ENVIRONMENTAL CORRECTIVE/PREVENTIVE ACTION REPORT FORM

Reference Number		**Date:** / /	**Initiator**	
Nature of Non-Compliance?	**Actual / Potential**	**Description of Non-Compliance:**		
Identified as a Result of:				
Date of Identification: / /		**Identified By:**		
Agencies/Bodies Informed, Date and Details:				
Action Plan:				
Responsibility:				
Target Date for Completion: / /		**Actual Date of Completion:** / /		
Closed by:		**Date:** / /		

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TO WHOM IT MAY CONCERN

We act as Insurance Brokers to Bord Na Mona Plc and Associated / Subsidiar / Companies and are pleased to confirm that the following insurances are in place:

A: Public/Products Liability

Limit:	€ 13,000,000
Insurer:	Syndicate 386 (QBE).
Expiry Date:	31st March 2010.
Policy No:	AA080255

B: Employers Liability

Limit	€ 25,000,000
Insurer:	Syndicate 386 (QBE).
Expiry Date:	31st March 2010
Policy No.	AA080255

C: Stevedores Liability

Limit	€ 6,400,000
Insurer:	Allianz.
Expiry Date:	30th September 2010
Policy No.	CO CGL 0313827

We trust that this is the information required but should you require any further detail please do not hesitate to contact us and we will be happy to answer any queries.

Yours faithfully

Graham Porter
Account Manager

Direct Line: 266 6422
E-mail: graham_porter@aon.ie

ATTACHMENT K – REMEDIATION, DECOMISSIONING, RESTORATION AND AFTERCARE

An Environmental Liabilities Risk Assessment will be prepared and submitted to the Agency for agreement.

Cessation and Decommissioning of Activity

In the event of cessation of waste transfer activities at the site, Bord na Móna PLC proposes the following closure and restoration measures: -

- Bord na Móna will ensure that all waste material is removed off site for appropriate treatment at licenced/permitted facilities
- The plant used at the existing site will be removed from the site by Bord na Móna
- Portable structures will be removed from the site, where applicable
- Road sweeper vehicles will be employed to clean the site
- Bord na Móna will remove all office equipment
- The weighbridge facility will be decommissioned and removed, if feasible
- Bord na Móna will provide the EPA with at least six months written notice of any intention to close the facility

Aftercare Management Plan – Residuals Management Plan

There are no plans to decommission this facility. To this end, a detailed aftercare management plan has therefore not been prepared. A clean closure plan will be prepared in accordance with the EPA Guidance Notes on Environmental Liabilities Risk Assessments.

If a decision is taken to decommission the facility, the Agency will be notified at least six months in advance of the closure and an aftercare management plan will be prepared and submitted to the Agency within this time period.

Activities at the site are unlikely to result in either groundwater or land contamination and there is no permanent storage of waste on site. All fuels are stored within appropriately bunded tanks.

Remediation of the site

The nature of activities that occur at the site will ensure that no remediation of the site will be necessary in the event of closure of the facility.

ATTACHMENT L – STATUTORY REQUIREMENTS

Attachment L.1 – Statutory Requirements

Section 40 (4) of the Waste Management Act 1996, amended by the Protection of the Environment Act 2003, sets out specific criteria of which the Agency must be satisfied before it will consider the granting of a licence;

> *(a) any emission from the recovery or disposal activity in question ('the activity concerned') will not result in the contravention of any relevant standard, including any standard for an environmental medium, or any relevant emission limit value, prescribed under any other enactment*

The information presented in the preceding attachments and in the accompanying Environmental Impact Statement has outlined the proposed activities at the facility and the means by which potential emissions will be mitigated and monitored. The design and operation of the facility will be in accordance with the BAT Guidance Notes for the Waste Sector: Transfer Activities. The applicant has a history of operation of similar licenced facilities and the management of these facilities and their past performance with respect to their licence conditions has been generally very acceptable to the Agency. The development of a facility in a greenfield will allow the applicant maximum scope to design, construct and operate the facility to the highest standards.

> *(b) the activity concerned, carried on in accordance with such conditions as may be attached to the licence, will not cause environmental pollution*

The information provided in Attachments H.1 – H.4, allied to that provided in Attachments I.1 – I.7, indicates the volumes of waste to be handled at the facility, the means by which it will be handled and the mitigation measures employed to ensure the potential for environmental is minimised or eliminated.

> *(bb) if the activity concerned involves the landfill of waste, the activity, carried on in accordance with such conditions, as may be attached to the licence, will comply with Council Directive 1999/31/EC on the landfill of waste*

Waste material accepted at the facility, that is neither recyclable nor recoverable, will be ultimately disposed of at a licenced landfill facility that will comply with the aforementioned Directive

> *(c) the best available technology not entailing excessive cost will be used to prevent or eliminate or, where that is not practicable, to limit, abate or reduce an emission from the activity concerned*

The classes of activities under the Waste Management Acts 1996 to 2003 which apply to the proposed facility, as identified in Attachment B.7 of this application, are covered by the BAT Guidance Note – Waste Sector (Transfer) of 2003 as produced by the Agency.

The measures used to prevent, limit, abate or reduce emissions from the facility, as outlined in Attachment F.1, are those recommended in the BAT Guidance Note where applicable.

> *(cc) the activity concerned is consistent with the objectives of the relevant waste management plan or the hazardous waste management plan, as the case may be, and will not prejudice measures taken or to be taken by the relevant local authority or authorities for the purpose of the implementation of any such plan*

The central objectives of the Waste Management Plan for the Midland Region 2005 - 2010 are:

1. Prevention and minimisation
2. Materials recovery (recycling/recovery)
3. Energy recovery
4. Safe disposal including landfill

It also sets a recycling target of 46%, thermal treatment of 37% and landfill disposal of 17% for the region.

The Plan policy (Part 4) sets out specific objectives and targets for the Region for the period 2005 – 2010 in relation to materials recovery facilities and waste transfer facilities (Section 16.6);

- *Local authorities shall support the development of additional transfer facilities where they can be shown to be consistent with the overall objectives of the Plan and have regard to good principles of siting*
- *Local authorities shall ensure MRF's and Waste Transfer Stations are operated in compliance with Waste Permits and the expansion of existing facilities to include pre-treatment technology is supported*

It is considered that the proposed development is consistent with the overall objectives of the plan through the provision of infrastructure for the recycling and recovery of materials in compliance with the requirements of the waste hierarchy.

It is also stated in Section 16.6 of the Plan that *'it is anticipated that these facilities will be expanded should the demand arise'*. The development of the proposed facility demonstrates the realisation of this statement.

In addition, the 'Target to 2010' identifies that *'local authorities shall ensure that the future development of MRFs in the region include provision for the pre-treatment of mixed municipal and industrial waste prior to disposal to landfill from 2007 onwards'.* The proposed development adheres to this desire through the processing of material that has been pre-treated through source segregation in the case of paper, card and organic materials. Material accepted at the facility that is bulked up and sent to landfill consists of inert C&D materials only that, when landfilled, do not impact on the achievement of targets with respect to the Landfill Directive.

Section 16.12 of the Plan addresses the issue of the Proximity Principle with the policy set out as follows:
'The proximity principle should be taken into account however it is recognised that there should be flexibility with respect to the movement of waste across regional boundaries and within the Region. The capacity of waste facilities in the Region should, as far as possible, satisfy the needs of the Region whilst allowing some element of flexibility of movement of waste into and out of the Region in line with the policy direction issued by the Minister in May 2005 under section 60 of the Waste Management Act, 1996 (as amended).'

The proposed development adheres to the policy outlined in the Plan through the servicing of the needs of the region in terms of material recycling and waste transfer facility capacity while balancing this with the requirement for Bord na Móna to operate a centralised material recycling for mixed dry recyclable material under its control, whereby some materials are imported into the region from other regions for the purpose of processing.

(d) if the applicant is not a local authority, the corporation of a borough that is not a county borough, or the council of an urban district, subject to subsection (8), he or she is a fit and proper person to hold a waste licence

Refer to Attachment L.2

(e) the applicant has applied with any requirements under section 53

The Bord na Móna Plc Annual Report 2008/2009 indicates a group turnover of €401 million and a profit of €15.9 million for year end 2009. Bord na Móna is therefore in a very strong position to adhere to any financial provisions and aftercare requirements for the proposed facility as per section 53 of the Waste management Act 1996.

(f) energy will be used efficiently in the carrying on of the activity concerned

Attachment G.2 identifies the issues in relation to energy efficiency at the proposed facility.

(g) any noise from the activity concerned will comply with, or will not result in the contravention of, any regulations under section 106 of the Act of 1992

Attachments E.5 and F.6 of this application identifies the measures by which noise emissions will be controlled and minimised.

(h) necessary measures will be taken to prevent accidents in the carrying on of the activity concerned and, where an accident occurs, to limit its consequences for the environment

Attachment J identifies the means by which accidents, both from an environmental and health and safety point of view will be minimised and controlled in the event of their occurring.

> *(i) necessary measures will be taken upon the permanent cessation of the activity concerned (including such a cessation resulting from the abandonment of the activity) to avoid any risk of environmental pollution and return the site of the activity to a satisfactory state*

The methods by which the decommissioning, aftercare, remediation and restoration of the facility will be addressed are outlined in Attachment K of this document.

Attachment L.2 Fit and Proper Person

The Applicant has never been convicted under the Waste Management Acts 1996 to 2003, the EPA Act 1992 and 2003, the Local Government (Water Pollution) Acts 1977 and 1990 or the Air Pollution Act 1987. The Applicant can ensure the Agency that persons employed in management positions at the facility will be able to demonstrate considerable experience in the waste management industry and will successfully complete the FÁS waste management training programme.