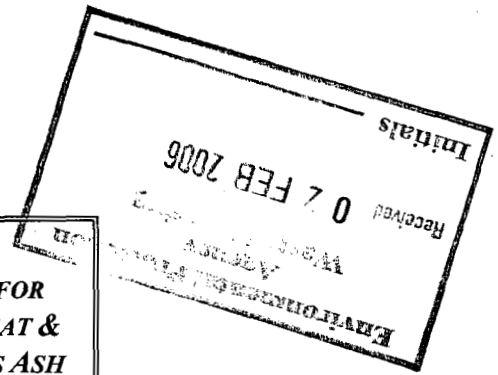


**PROPOSED ASH REPOSITORY FOR
DEPOSITION OF PEAT ASH, MEAT &
BONE MEAL ASH AND BIOMASS ASH
AT THE EXISTING ASH REPOSITORY
FACILITY AT CLONCREEN BOG,
CLONBULLOGUE,
CO. OFFALY**



- An Environmental Impact Statement -

NON-TECHNICAL SUMMARY

Date: November 2005

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A Submission to Offaly County Council by Bord na Móna Environmental Limited
on behalf of Bord na Móna Energy Limited.

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This Non-Technical Summary is a concise summation of the primary environmental aspects as outlined in the main Environmental Impact Statement (EIS).

1. INTRODUCTION

Bord na Móna Environmental Limited were commissioned by Bord na Móna Energy Ltd to complete an Environmental Impact Assessment. This EIS shall accompany a planning application with Offaly County Council for the acceptance of ash from the co-fuelling of peat with biomass (wood) and (treated) Meat and Bone Meal (MBM).

Bord na Mona operate an existing ash repository facility at Cloncreen Bog, Clonbullogue, Co. Offaly. This facility currently accepts ash from Edenderry Power Ltds (EPL) peat fired power plant. EPL have made an application with Offaly County Council and the Environmental Protection Agency (EPA) for the co-fuelling of the power plant with biomass (wood material) and (treated) Meat and Bone Meal (MBM). The extent of the use of MBM will be as a mix fuel to a maximum volume of 10% of total fuel input based on calorific value (maximum 100,000 tonnes per annum). Subsequently Bord na Móna Energy are applying to Offaly County Council for the acceptance of ash from the EPL facility.

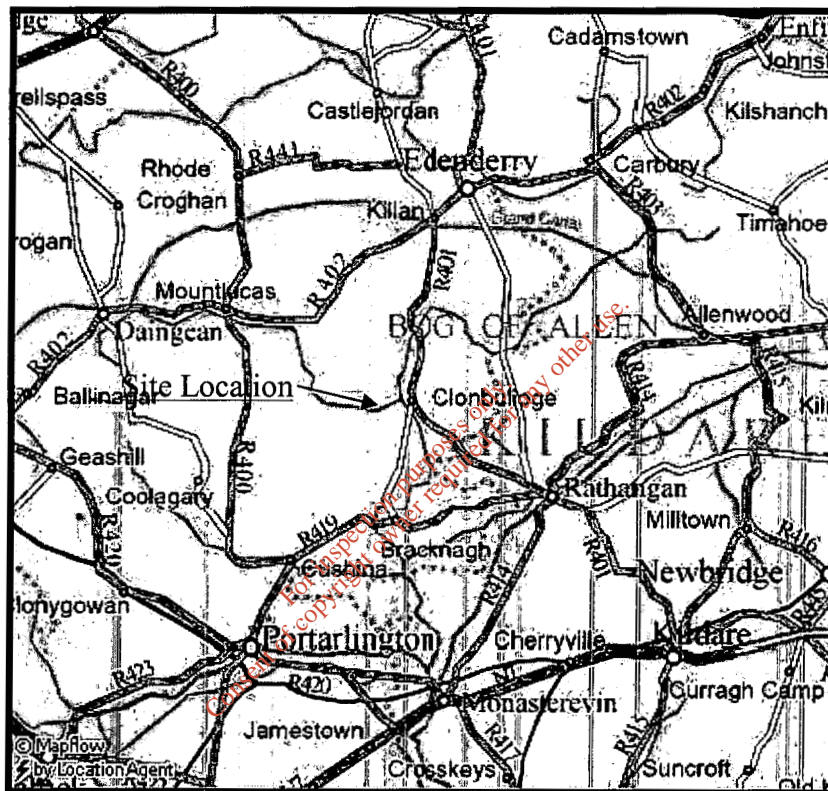
Bord na Móna Energy Ltd operate this facility under a waste licence with the Environmental Protection Agency (Register No. 49-1). A review of this waste licence is being carried out with the EPA, in conjunction with the planning application.

BAT technologies (Best Available Technology) will be used in all situations for site management and for the minimisation of environmental contamination.

2. PROJECT DESCRIPTION

2.1 Site Description

The Cloncreen ash repository is located approximately 8 km South West of the town of Edenderry and 2 km North West of Clonbullogue village. The facility is setback approximately 0.75 km from the Clonbullogue to Daingean road (Third Class Road which links with the Edenderry to Tullamore Regional Road - R402) (see below).



The landfill site is located on Cloncreen bog, a cut-away peatland area within the Bog of Allen. The Northern, Western and Eastern sides of the landfill site are bounded by raised and/or cut-away peatlands (approximately 800 hectares) while the Southern side is bounded by a tree line which is subsequently bounded by pastoral land.

The area is drained by a number of drainage ditches excavated in the peatland, draining water into the west-east aligned drainage channel along the side of the facility which ultimately discharges into the River Figle.

The facility is currently depositing ash in cell II with the construction of cell III almost complete. Cell I has been completed filled and restored. Cells in Phase I and II were constructed as per the specifications for non-hazardous waste landfill and their Waste

Licence 49-1. Under the agreement of the EPA, a new lining system has been approved and a cell III will be construction to these specifications.

2.2 Project Description

(i) Classification of Landfill & Classes of Activities

The relevant waste disposal and waste recovery activities, as per the Third Schedule of the Waste Management Act 1996, to which this application relates are:

Third Schedule – Waste Disposal Activities:

The principal activity on the site can be categorised as

- Class 1. Deposit on, in or under land (including landfill).

The applicable Waste Activity as per the First Schedule of the Waste Management (Licensing) Regulations, S.I. No. 185 of 2000 is 'The disposal of waste at a landfill facility where the annual intake is likely to exceed 20,000 tonnes per annum'.

(ii) Site Layout

The general layout of the Ash Repository facility including access roads and on site facilities/disposal areas is detailed in Attachment 2 *Drawing No. 2401057-1b: Site Layout Plan*: for both the existing facility.

The following infrastructures are located at the facility:

- Security Gate/Fencing
- Rail link
- Site office/canteen/service facilities
- Surface water drainage system
- Fire Control System

The facility is currently operational Mon-Fri (8 am – 6 pm), and Saturdays (8am – 4 pm) with no operations on Sundays. It is proposed to extent the operational hours from 8am – 8pm (Monday – Friday), 8am – 6 pm (Saturday) and 8 am – 4 pm on Sundays (only when necessary).

(iii) Quantity and Type of Waste Received

The ash repository site accepts furnace bottom ash and fly ash waste products produced from peat combustion within the fluidised bed boiler of the 120 Megawatt peat fired power station at Ballykillen, Edenderry, County Offaly.

Currently a total of approximately 29,000 tonnes per annum of fly ash and 5,310 tonnes per annum of bottom ash material is disposal at the ash repository. It is proposed that the volumes of ash will increase due to the nature of the ash with volumes increasing to ca. 60,000 tonnes per annum.

Since the commencement of activities on the site the quantities of waste accepted at the facility are detailed in Table 1.3/2 below.

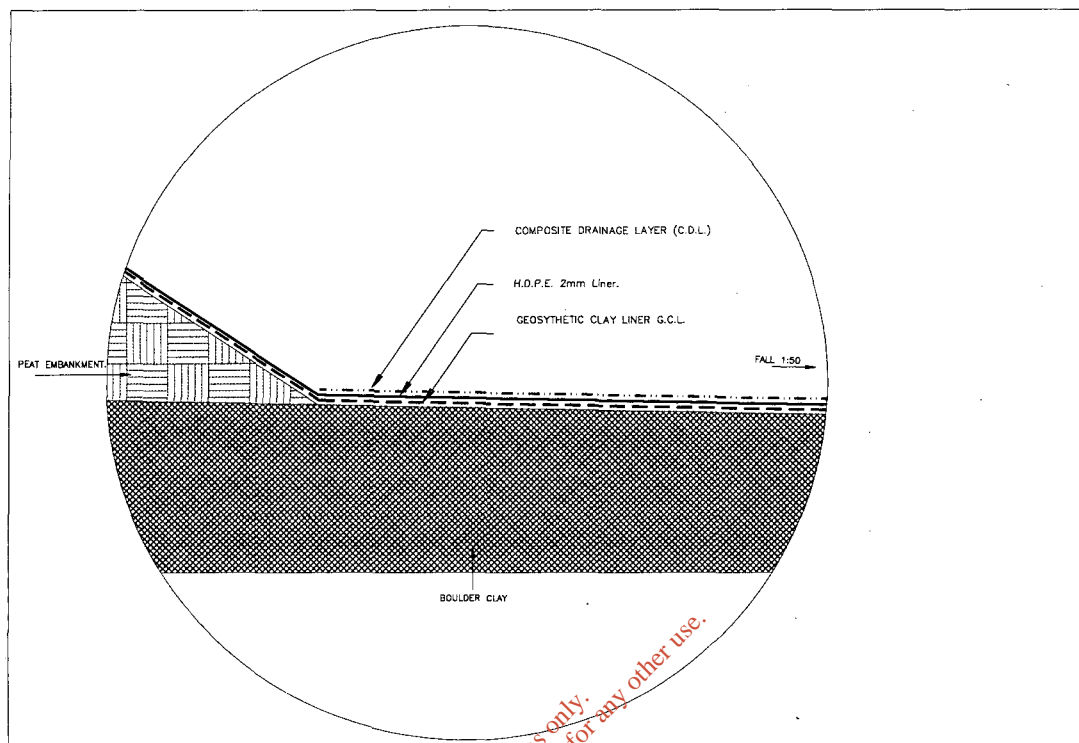
Table 1.3/1: Types & Qualities of Waste Accepted To-date

Year	Bottom Ash	Top Ash	Total
2000 (8-31 December)	356 tonnes	1,561 tonnes	1,917 tonnes
2001	6,471 tonnes	20,578 tonnes	27,049 tonnes
2002	4,920 tonnes	22,333 tonnes	27,253 tonnes
2003	4,500 tonnes	24,092 tonnes	28,592 tonnes
2004	5,310 tonnes	29,251 tonnes	34,561 tonnes
2005 (up to 01/10/05)	4,199 tonnes	19,290 tonnes	23,489 tonnes

(iv) Lining & Leachate Management System

Phase I & II cells have been constructed as per condition 4.9 of the existing Waste Licence (49-1). The liner is composed of composite liner consisting of a basal soil layer (1 metre thick with permeability of $<1 \times 10^{-9}$ m/s), and 2 mm thick high density polyethylene (HDPE) layer. The liner is overlain by a 50 cm deep leachate collection layer (see overleaf). In the event that ash from the co-fuelling of peat with biomass and Meat and Bone Meal (MBM) is accepted at the facility these lining system arrangement will be maintained.

Figure 1: Lining System for Non-Hazardous Waste Ash.



Under agreement of the EPA, a new lining system has been is operational at the facility, (cell III with be constructed to these specifications). Intrusive site investigations at the facility indicate the presence of an impermeable clay layer (>1 m deep; K ranging from 1×10^{-8} m/s to 6.4×10^{-9} m/s), which will act as a nature barrier preventing the contamination of the subsurface soil and groundwater. A synthetic drainage layer will be placed on the subsurface. Leachate, if any, generated from the ash will percolate along the drainage layer beneath the ash and into a sump which is then pumped into the leachate drainage system.

The leachate management system will allow any leachate generated, if any, to flow into the leachate drainage channels which directs leachate into the sumps which is then pumped into the Interceptor Lagoon. Water within the interceptor lagoon will be re-circulated as dampening water for dust suppression purposes.

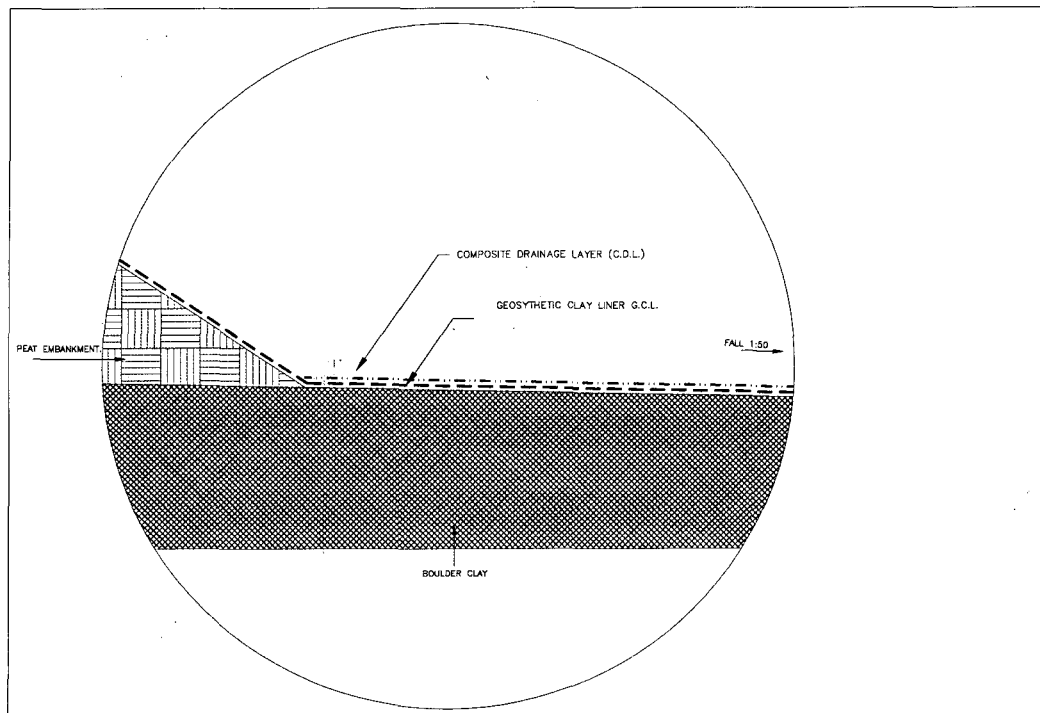


Figure 2: Lining System for Inert Waste Ash.

(v) **Operating Procedures/Management**

The day to day management and operation of the site is the responsibility of the general manager who is responsible for the overall management of the site and the maintenance of the Waste Licence (49-1).

Additional staff include the Transport/Quality Manager who is responsible for the transportation of the ash to the facility and the Environmental Co-originator who is responsible for the day to day implementation of compliance monitoring and reporting for the Waste Licence (49-1).

Incoming ash is deposited at the facility from especially designed rail wagons directly into the active cells at both side of a rail link which will run along the unloading point links. In-situ dampening of ash will be afforded by an on-site water dowsing system and a tracked excavator is used to for levelling and compaction of the deposited ash. Ash will be deposited to final levels (8 m above cell base level) into cells which will be filled successively in phases. Therefore, a cycle of progressive filling across the site will occur, with one phase being restored while a second is filled and a third prepared for filling.

Waste acceptance procedures involve the registration of incoming ash loads which includes the logging of the waste load content (type, quantity) and time and location

of deposition. These are carried out as per the waste ash acceptance and handling procedures.

(vi) Aftercare Management

Once the cells reach final levels, capping and seeding of cells will occur in order to stabilise the surface. Vegetation cover permits water to be lost by transpiration and hence contributes to the reduction of rain infiltration.

Environmental monitoring of the site will continue after its closure and restoration stage. The programme will be determined and reviewed at regular periods on the basis of the on-going monitoring conclusions.

Monitoring will be conducted periodically to assess any land settlement and slope stability.

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3 ENVIRONMENTAL IMPACT ASSESSMENT

The environmental impacts of the proposed development are described under the following categories as required by the Waste Licence Application

Air	Ecology
Surface Water	Landscape/Cultural Heritage
Geology	Noise
Hydrogeology	Climatic Factors
Human Beings	

In order to predict the impacts of the waste disposal facility on the existing site and its environs it was necessary to establish the existing baseline conditions in the area. To this end a series of field and desk based studies were initiated by technical staff from Bord na Móna Environmental Consultancy Services in April 1998. As part of the requirements of the Waste Licence (49-1) on-going environmental monitoring (air, water, soils and noise) has taken place since granting of the licence in April 2000.

3.1 Human Beings

(i) Noise/Traffic

Noise is an identified form of air pollution and uncontrolled it can cause nuisance or a deterioration of amenities and the quality of human life. The potential impact of the proposed development on noise levels within the area is associated with the noise generated through on-site activities. On-going monitoring of ambient noise levels at the facility have shown that there is no increase in the background noise levels at the facility and specifically, noise levels at the nearest sensitive location (occupied residential premises) have not significantly deviation above background daytime noise levels.

Access to the site by road is restricted to workers and visitors only. All transportation of materials (including the ash), is via rail links. Traffic movements generated by the Ash Repository site are therefore not consider to pose any adverse impact on the existing road network. There will be no increase in road traffic movements due to the proposed developments at the facility.

(ii) Human Health

A variety of air pollutants have known or suspected harmful effects on human health and the environment as a result of the proposed development (aerosols, dust, odour etc). With the incorporation of MBM ash into the waste ash, concerns of health risks from potential levels of dioxins and possible BSE infectivity needs to be addressed. A risk assessment was carried out on the waste ash and it reported that the risk from exposure from the ash on the human health was low. Analytical characterisation of the ash determine that the composition of the ash is similar to that of the existing ash accepted at the facility.

Environmental control measures are in place at the facility to minimise the impacts of the facility. In summary, it is concluded that these proposed mitigation measures e.g. dampening of the ash at source and in-situ, will minimise direct emissions and associated microbial emissions to the atmosphere. Therefore, the associated potential risk to the local community will be extremely small.

It is anticipated that there will be no significant emissions to the environment, as the extended site will comprise of a fully engineered landfill site.

(iii) Site Structure / Land Use

Any potential impacts of the proposed development on the existing structural and land usage of the area are considered insignificant. There will be no building construction undertaken at the facility. Land usage in the vicinity of the development site is predominately low intensity agricultural pastureland.

The site is not considered to have any significant agricultural importance, nor is it an area of foreseen future growth. The site will be designed and worked in such a way as to inflict minimum visual intrusion on existing residential dwellings, and road users.

(iv) Nuisance

Given the inert nature of the waste deposited at the facility, it is not envisaged that pests (such as birds and vermin) will be attracted to the site, and therefore do not pose a nuisance to the local community.

(v) **Material Assets**

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

3.2 Ecology

Assessments of the flora and fauna populations at the site, carried out in 1998, 2002 and 2005 demonstrated that the area is of relatively little ecological significance comprising mainly of a low diversity pastoral grassland and drained peatland habitat which is very common in the locality.

The existing environment is not designated as a Natural Heritage Area (NHA) or a Special Protection Area (SPA) under the Birds Directive (79/409/EEC) and the Wildlife (Amendment) Act 2000 (S.I. No. 38 of 2000) or as a Special Conservation Area in accordance with the Habitats Directive (92/43/EEC). The overall conservation value of the site is considered low.

The restored cell that has been capped in the last 12 months illustrates that local flora has colonized the soil used to cap the cell. The cell appears to have been colonised by invasive weed species rapidly on the disturbed ground for a short period before becoming colonized with flora that exists in the local area.

3.3 Geology

According to published literature the bedrock geology in the vicinity of the Cloncreen Ash Repository site is documented as being dominated by the Upper Palaeozoic Lower Carboniferous Allenwood Formation (Edenderry Limestone). The Edenderry Limestone is reported to comprises of poorly bedded, pure, medium to coarse grained limestones ranging in age from Chadian to Arudian. This bedrock type is considered to be typical of shelf margin oolitic environments.

Quaternary deposits identified beneath the site consist of residual peat deposits; overlying blue-grey silty clay; overlying boulder clay. Depth to bedrock range from 4.5 m in northwest of the site to 6.4 m in the east of the site.

Permeability tests undertaken in the underlying quaternary deposits ranged from 1×10^{-8} m/s to 6.4×10^{-9} m/s.

The overall impact of the proposed development on the underlying soil and geology on completion of the proposed development is expected to be negligible. As a result of this, no specific mitigation measures are proposed.

3.4 Hydrology

The facility is located within the River Figile catchment, which is part of the Hydrometric Area No. 14 (River Barrow). Surface water drainage ditches excavated into the peatland drain towards the southern boundary of the site discharging into the River Figile at the south eastern perimeter of the site.

Baseline and on-going monitoring of the surface waters within the vicinity of the site indicate that the water quality of discharge waters from the site (SWR1 & SWR2) is deemed to be satisfactory with marginally elevated COD (18 – 102 mg/l), Ammonia (<0.2 – 2.72 mg/l), and Manganese. Water quality results taken upstream (SW1) and downstream (SW4) of the discharge point indicate that there is a general increase in Ammonia (0.87 → 1.45 mg/l), COD (235 mg/l), Total Suspended Solids (ca. 60 → 80 mg/l) and Manganese as you travel downstream.

The results of the water quality within the River Figile indicates that the water is classified as moderately/ slightly polluted both upstream and downstream of the site. It is noted that results illustrate that the water quality downstream of the site is slightly improved with regard to COD, TSS and Manganese while ammonia levels are slightly higher.

Mitigation measures, BATNEEC and good engineering practices will be employed to ensure to adverse impacts will occur on the receiving waterways as a result of the activities occurring at the facility. These will include:

- excavated stockpiled material shall be kept away from the surface water drains throughout the site, and shall be made secure during the operational phase;
- fully engineered leachate collection and management system shall be installed at the facility to ensure no uncontrolled discharges on the receiving environment.

3.5 Hydrogeology

Groundwater beneath the site was encountered in both the Quaternary deposits (refer to as shallow groundwater) and bedrock at depths ranging of 65.6 to 69.2 m O.D and 66.1 m to 69.4 m OD respectively. Groundwater movement is towards the south east (both Quaternary and bedrock).

The aquifer classification of the bedrock geology is tentatively given by the GSI as locally important which is moderately productive (Lm).

The vulnerability rating was classified as Moderate to High based on the hydrogeological setting identified from geological borehole lithology descriptions where residual peat deposits (1 – 2 m) were identified above 3 – 10 m of interpreted moderately permeable subsoils (silts & clays).

The tentative groundwater resource protection code assigned to the Ash Repository site is **Lm/H** to **Lm/M** (locally important, moderately productive and moderately to highly vulnerable to contaminants).

The quality of the groundwater beneath the site is generally good with naturally elevated levels of ammonia, iron and manganese. Monitoring of groundwater carried at the facility to-date have shown little variances in water quality from the up-gradient and down-gradient monitoring boreholes.

Mitigation measures, BATNEEC and good engineering practices will be employed to ensure to adverse impacts will occur on the receiving waterways as a result of the activities occurring at the facility. These will include:

- fully engineered lining system shall be installed at the facility in compliance with the Waste Licence 49-1 to ensure no uncontrolled discharges on the receiving environment.

3.6 Air

Potential air emissions from the Ash Repository facility may be categorised under the following headings:

- Odour
- Dust
- Fine Particulate Matter/Aerosols

Odour emissions from landfill facilities occurs when biodegradable material is deposited of in a landfill. It is noted that no such material will be disposed of on-site. Indeed, the nature of the ash to be deposited on the proposed site may be described as inert (i.e. neither non-biodegradable nor chemically active). As a result, the generation of noxious odours will not result due to activities at the ash repository facility.

The impact of dust emissions from the landfill site is minimal. Since the commencement of ash deposition at the facility, dust monitoring has not exceeded the emission limit of 350 mg/m²/day as a result of activities occurring at the facility. Dust control procedures has been implemented on the site and consequently immissions in the surrounding areas is reduced. Dust control procedures in the current operational procedures at the facility including dampening of fly ash material at source, dampening of deposited ash on-site, and capping restoration and reseeded of finished cells will reduce dust emissions to a minimum.

In relation to both fine particulate matters PM₁₀ and aerosols, given the nature of the ash, no direct emissions of aerosols and associated microbial emissions to atmosphere will occur. On-going monitoring of PM₁₀ and aerosols takes place at the facility as part of the requirements of the waste licence and to-date no exceedence of the emission limit of 50 µg/m³ has occurred.

The proposed development at the existing ash repository facility for a change in the ash accepted at the facility. Currently ash accepted at the facility is from the burning of peat. The is proposed to accept ash from the co-fuelling of peat with biomass and/or MBM. The acceptance of ash with an MBM fraction has implications on health issues. A risk assessment on the potential levels of BSE Infectivity and dioxins in the Ash material carried out by Dr Kevin McDonnell of UCD. This assessment concluded that there would be negligible risk to humans from burning of MBM (including SRM).

3.7 Noise

Taking into account the location of the landfill site in relation to the nearest dwelling, and the results of the ongoing noise monitoring programme taken at the site, noise generated at the facility does not pose any undesirable effects on the existing neighbouring environment.

3.8 Landscape & Cultural Heritage

The proposed development site is a greenfield site located approximately 0.75 km setback from the Clonbullogue to Daingean road. The area is a predominantly low intensity farmland area and cut-away peatland. Topography the area is flat and the design of the landfill minimise any visual impacts.

There is no evidence to suggest that the existing Ash Repository facility is situated in an area of any cultural or historical importance or infringes on any areas of heritage value. While there are no foreseen archaeological implications, given the nature of peat as a repository of archaeological/cultural heritage artifacts, structures and deposits, it is possible that material may exist directly in the peat horizons. Due to this, during the constructional phases all activities will be monitored by an archaeologist, employed by the developer.

3.9 Climatic Factors

The climate of the proposed development site is characterised as follows:

- prevailing wind is west - southwesterly;
- long term monthly mean precipitation ranging from 7.2 mm to 161.9 mm;
- Ambient air temperatures ranging from 6.2 °C to 21.8 °C.

It is not considered that the development will have any impact on the climate in this area.

4 ENVIRONMENTAL MONITORING/AFTERCARE

As part of the requirements of the existing Waste Licence (49-1) monitoring of dust, noise, surface water, groundwater, leachate, and meteorological data is carried out on a regular basis.

Dust: Dust monitoring is carried out three times a year at the existing landfill boundary locations. Dust monitoring is carried out in accordance with recognised standard procedures.

Noise: Noise monitoring is carried out on an annual basis at the existing landfill boundary locations and the nearest noise sensitive locations.

Surface Water: Surface waters within and outside the existing facility are monitored on a weekly, quarterly and annual basis for an extensive range of chemical parameters.

Groundwater: Groundwater monitoring is carried out on the shallow groundwater in the quaternary deposits and the deeper bedrock aquifer. Sampling is carried on a weekly, quarterly and annual basis within the existing site boundary for an extensive range of chemical parameters.

Meteorological Data: A weather station has been installed at within the vicinity of the facility. This weather station records the following parameters: temperature, humidity, wind speed, wind direction, rainfall and pressure on a daily basis. Annual data from this weather station will be forwarded to the EPA on an annual basis.

Ongoing environmental monitoring will dictate the nature, extent and duration of additional aftercare required.

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