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## 8.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

### 8.1 Introduction

This section of the EIS describes the preliminary design of the various elements of the proposed development. It is proposed to accept, process, recover and use inert materials, including inert wastes, to restore a Site that includes extensive areas of worked out sand and gravel extraction, partially restored lands, silt ponds, processing plant, concrete batching plant and surface water ponds. This section of the EIS also describes the proposed construction, operation, management and closure of the Facility.

The proposed Facility will include 4 major elements:

- Reception Area where trucks carrying potential restoration materials will be received, checked in, and weighed;
- Inert Waste Processing Area (IWPA) to extract useful soils/fines and hardcore materials from inert waste streams arising at building and road works sites;
- A surface water management pond and screening berms on the western side of the Site, and screening berms on the northern side of the Site; and
- Zones where soils and like material will be placed on the ground to build up the surface contours to final design levels conceived by the project engineers, scientists and landscape architects.

The assumptions made in relation to the design of the Facility are provided in Section 8.2 below. The starting point for the design is the identification of the lands to be included in the development.

The boundary of the proposed Facility and the lands to be used for the development are shown on Figure 8.1. An aerial photograph (June 2004) which depicts the physical features at the Site is presented as Figure 8.2.

### 8.2 Design Assumptions

The assumptions made at the outset of the preliminary design process for the restoration works are outlined below:

#### **End Use of Site and Final Contour Plan**

The Applicant's intention is to continue to restore the worked out sand and gravel pit to create a landform that is in keeping with the rolling nature of the Eastern Kildare Uplands Transition Character. The currently proposed end use will be agricultural with some passive recreational

features around the western boundary. Figure 8.3 shows a final contour plan for the restored site, developed by the landscape architects, ecologists, engineers and planners for the project in detailed consultation with Punchestown Racecourse, Kildare Co. Council and the Applicant.

### **Types of Materials to be used to Complete the Restoration Works**

The types of materials to be used in the restoration works will be *inert* in accordance with the definitions provided in the Council Directive 99/31/EC, on the landfill of waste (Article 2).

### **Hydrogeological Conditions and Constraints**

Section 12.0 of the EIS deals with the Site groundwater conditions in detail. Based on a review of the available groundwater monitoring data, groundwater flow beneath the Site in both the overburden and bedrock is generally toward the west-northwest.

The aquifer in the southeast corner of the Site has been classified by the GSI as having Extreme vulnerability because rockhead is at a high elevation (Figure 12.7). Therefore, in accordance with the precautionary principal, no materials will be placed in this area, and an appropriate exclusion zone has been applied. The remainder of the Site was classified by the GSI as having High vulnerability. However, the results of a ground investigation carried out by Golder indicate that there is a minimum of 70 m of glacial deposits (mainly silty sands) underlying the Site, indicating that a vulnerability rating of Moderate is more appropriate (see subsection 12.3.14).

### **Ecological Conditions and Constraints**

During Site visits in 2007 and 2008 Golder ecologists observed lapwing on agriculturally improved wet grasslands on the southern part of the Site adjoining Pond B. The filling restoration works will be carried out in a manner such that the areas important to lapwing for nesting and foraging will be retained through appropriate mitigation measures (Section 10 and Figure 10.3).

### **Footprint of Materials to be placed to Complete the Restoration Works**

The footprint of the materials to be placed on the Site, to enable its restoration, will be constrained by hydrogeological and ecological conditions and 100 m buffers defined around adjacent residences where possible. Also, through consultation with Management of the Punchestown Racecourse, there will be constraints placed on, and requirements made of, the proposed works to satisfy the needs of the Racecourse Management. The area in which materials will be placed to satisfy the various project requirements is shown on Figure 8.3.

### **Engineered Containment and Control Requirements**

Imported materials will be placed on existing ground conditions, depicted on Figure 8.1, to enable construction of the landform as shown on Figure 8.3. As some of these materials will

be considered wastes by definition, and therefore a waste licence will be required, the Best Practice engineering requirements of the EPA will also need to be satisfied. Some of the EPA requirements that are expected, based on experience and guidance provided in the EPA Landfill Manuals on Site Design and Restoration and Aftercare (EPA 2000, EPA 1999), will include:

- Perimeter bunds or berms to control runoff, as required, and provide visual screening;
- Surface water management and silt settlement ponds;
- Internal drainage systems to handle runoff from the emplaced materials during the process of filling and undertaking the restoration works;
- An engineered base liner. The specification of the base liner will meet the minimum requirements prescribed by the EPA in Licences for inert waste landfills i.e. a mineral layer 1 metre thick and having a permeability of less than or equal to  $1 \times 10^{-7}$  m/sec;
- Perimeter drainage channels/infiltration trenches and contour drainage channels to convey run-off from the restored surface, to help ensure that there is no water ponding on the surface; and
- An engineered capping system comprising an inert soil layer at least 1 metre thick and including a minimum of 150 mm of growth medium e.g. topsoil.

### **Infrastructure Requirements**

Ancillary works will be required, prior to placement of materials on the ground in engineered lined cells. These works will include: construction of access roads across the Site; drainage channels; and surface water management and silt settlement ponds. A wheel-wash will be provided to mitigate dust and mud impacts. A weighbridge and a waste reception check-in area will also be provided, to monitor the quantity of the different types of materials imported to the proposed Facility and also to record the quantity of any unsuitable or recoverable materials exported from the Facility. A waste quarantine area will also be provided to hold materials that are deemed to be inappropriate for processing and restoration and not meeting the acceptance criteria for restoration materials.

### **Engineering Materials**

There will be a need to find a source of engineering materials to construct: screening bunds or berms; the low-permeability lining system in the engineered cells; and the capping system. All the required engineering materials may not be available within the Site and, consequently, some may need to be imported where necessary. It is expected, though, that most of the materials will come from the Site for these purposes, except the screening berms which may be formed from suitable imported clayey soils.

### 8.3 Overview of Proposed Development

The Site to be restored is ca. 68.0 ha. The development Site will include buffer lands (where no works will be carried out), reception/entrance area, an Inert Waste Processing Area, surface water management ponds, perimeter screening and landscaped berms, and engineered cells/zones where inert materials (soils) will be placed to restore the Site and recreate a new landform. The engineered Facility will have a number of elements and will be constructed in a number of stages. The principal elements are as follows:

- Facility Services and Infrastructure (Section 8.4)
- Initial Development/Restoration Works (Section 8.5)
- Ongoing Restoration Works (Section 8.6)
- Landscaping (Section 8.7)
- Monitoring Infrastructure (Section 8.8)

These various elements are discussed separately in the sub-sections indicated above.

In keeping with the requirements of the EPA in regard to licensed waste management facilities and Best Available Techniques (BAT), a range of services and infrastructure features will be provided at the Facility. Most of the infrastructure itemised below will be provided on a temporary basis and will be removed upon completion of the capping and final landscaping works.

Permanent Works will include:

- Drainage channels and surface water management ponds/infiltration basins for surface water run-off;
- Screening berms and embankments;
- Infiltration trenches for surface water run-off;
- Some of the access roads and tracks on the Site;
- Monitoring installations; and
- Security measures, which will mainly consist of stock proof fencing, security fencing and lockable gates.

Temporary Works will include:

- Site accommodation including general office (existing), canteen (existing), and weigh bridge office (existing);
- Hard-standing areas for plant and construction materials and car parking;
- Weighbridge (existing);
- Wheel-wash facility for road-going vehicles;
- Fuel tanks and storage/load out areas (existing), to be modified and enhanced with bunding and fuel interceptor;
- Waste quarantine area;
- Inert Waste Processing Area with crushing and screening plant;
- Laboratory facilities (for materials/soils testing);
- Mobile crushing and screening plant; and
- Compound for plant and equipment.

Further details on these services and Facility infrastructure and the proposed restoration works are presented in the sub sections that follow.

#### **8.4 Facility Services and Infrastructure**

All of the proposed and/or Facility site services infrastructure are described in the following subsections and shown on Figures 8.4, 8.5 and 8.6.

##### **8.4.1 Site Security Arrangements Including Gates and Fencing**

There is already an appropriate gate and fencing at the entrance to the Facility; however, security around much of the perimeter is not sufficient for a licensed facility. Permanent security will be provided around the Facility itself by enhancing existing dense hedgerows, and installing 1.2 m high post-and-wire fencing where required.

##### **8.4.2 Site Access and Roads**

The Facility will be accessed from an existing entrance located on the Local Road L6042. Some minor cut-and-fill earthworks will be required to improve the surface of the haul roads

throughout the Site, in preparation for the construction of the proposed landform for acceptance of inert materials.

All haul roads will be engineered and constructed of hardcore material and some of these will be surface treated, in particular at the entrance to the Facility.

#### **8.4.3 Hard-Standing Areas**

Hard-standing areas will comprise well-compacted granular fill (hardcore) or, in select areas, concrete and/or macadam surfaces. The purpose of the hardcore is to provide a lay-down area for materials and areas for parking vehicles. The concrete surfaced area will be for waste quarantine, and bunded areas for refuelling plant (Figures 8.4 and 8.5). The concrete-surfaced hard-standing areas will be removed upon completion of the project.

#### **8.4.4 Weighbridge**

A weighbridge currently exists on the Site and this will be maintained in position for the duration of the Restoration Project. This will allow weighing-in of incoming loads and weighing-out of any wastes which do not meet the acceptance criteria (described later) and are thus rejected and sent off-Site to other licensed facilities.

#### **8.4.5 Wheel-Wash**

A new purpose-built wheel-wash will be fed by a water supply borehole on-Site (see Figure 8.5). The wheelwash will be maintained for the duration of the Restoration Project and the effluent from the wheel wash will be recycled.

#### **8.4.6 Laboratory Facilities**

There will be a basic materials-testing laboratory on the Site to assess the fill materials used in construction of embankments, liner and the capping system.

#### **8.4.7 Fuel Storage Areas**

Diesel fuel and hydraulic oil will be stored on-Site in appropriately bunded areas. Two (2 No.) 5,000 litre diesel tanks are proposed, which will fuel all plant utilised for the duration of the Restoration Project. An appropriately bunded fuel load-out area, with fuel interceptor, will be provided (Figure 8.5). Mobile plant will be driven to the fuel load-out area for refuelling. A bunded fuel bowser will be used, as required, to fuel fixed plant.

#### **8.4.8 Waste Quarantine Areas**

In line with best-practice procedures, a waste quarantine area will be provided on-Site to hold, pending removal from Site, inappropriate wastes that are rejected at the Facility during waste placement. Two waste quarantine areas (contained, concrete, hard-standing areas) will be provided on-Site: it is proposed to use an existing shed in the inert waste processing area for quarantine of smaller waste items, and a concrete surfaced area for skips to quarantine rejected waste (Figure 8.5).

#### **8.4.9 Materials Inspection Areas**

All imported materials will be inspected as it is tipped in selected lined cells or fill zones. It will also be inspected when tipped in the Inert Waste Processing Area (Figure 8.5).

#### **8.4.10 Traffic Control**

The operator that is appointed to construct, operate and close the Facility will control traffic in and around the Site. Signage on Site will be used wherever required.

#### **8.4.11 Sewerage Infrastructure**

The foul sewage will be handled in the existing septic tank/percolation system (Figure 8.5) and, as required, approved temporary toilet blocks draining to a sealed holding tank. The tank will be pumped out by an approved contractor on an as-needed basis.

#### **8.4.12 Other Services**

The Facility will require power, telephone and a water supply.

There are single-phase and three-phase power supplies at the existing Cemex Facility. This will be utilised for the duration of the Restoration Project.

There are also telephone lines serving the existing Cemex Facility which again will be utilised for this project.

Fixed overhead pole lighting will be provided in the main reception area and office area/compound of the Site. This lighting will be removed upon completion of the project. Temporary mobile lighting will be used in the areas of major construction and earthworks. Power for this lighting will be provided by diesel generators.

There is mains water available at the gate of the existing Cemex facility, which will be utilised for potable water for the duration of the project. Water for dust suppression and wheel wash will be abstracted from an existing groundwater well on-Site, close to the

entrance to the Facility (Figure 8.5). This is an historical well, and if supply is found to be not suitable an alternative borehole will be drilled.

#### **8.4.13 Plant Sheds, Garages, and Equipment Compound**

Equipment will initially be parked on the Site in a compound that will be constructed just south of the inert waste processing area (Figure 8.5). Plant may also be parked within the base of the existing worked out sand and gravel pit. Major servicing/repairs of mobile plant will take place off-Site. Minor servicing will take place in an existing shed midway along the eastern boundary of the Site (Figure 8.4).

All liquid hydrocarbons handled on-Site will be carefully managed and contained in bunds.

#### **8.4.14 Site Accommodation**

There is an existing office/store alongside the weighbridge (Figure 8.5). The interior of this building will be refurbished and used. The interior of the existing offices and canteen to the east of the entrance at the Site will be refurbished and used during the land-restoration project.

#### **8.4.15 Inert Waste Processing Area (IWPA) and Plant**

The sources of materials to be used for berm construction, lining and capping will be from either on-Site or off-Site sources. Since it is possible that materials with mixed particle sizes may be available from within the Site footprint, or from off-Site sources, these materials will be screened and/or crushed as required to produce some of the berm-material requirements. Furthermore, the Applicant endorses National Waste Management policies and intends to recover inert materials that can be used off-Site in construction of roads and the manufacturing of concrete products. This is considered to be a suitable and sustainable concept that both the planning authority and the Agency support. As such, provision has been made for an inert waste processing area (IWPA) in which suitable and appropriate screening and crushing plant will be set up and operated in the northern part of the Site as shown on Figure 8.5.

The area set aside will include a 5 m high noise-attenuation berm, hardcore surface area and will be landscaped appropriately (Figures 8.5 and 8.6). Screening and crushing plant will be employed to process imported materials to produce recycled aggregates for on-Site or off-Site use.

It is expected that the majority of inert waste materials arriving at the Facility will be source-segregated, therefore will be emplaced directly in lined cells with no on-Site segregation/processing. However, it is expected that ca. 15% of the inert waste materials will not be source-segregated, thus requiring processing prior to emplacement. As such, the IWPA will be used to sort/process loads, if necessary, of mixed inert waste arriving on Site.

## 8.5 Initial Development/Restoration Works

Upon receipt of a waste licence and planning permission, and establishment of the infrastructure described in the preceding section of this EIS, the ongoing restoration works described herein, including importation of inert soil, will be undertaken concurrently with the construction of essential and enabling drainage works.

### 8.5.1 Existing Surface Water Drainage and Initial Drainage Works

#### 8.5.1.1 Existing Surface Water Drainage

As shown on Figure 8.1 there are 5 No. existing ponds on the Site labelled A1, A2, A3, B and C. To restore the Site ponds A2, A3 and B will be filled in. One of the ponds, A1, will be maintained and expanded into a linear water feature along the western boundary, as agreed with the Management of Punchestown Racecourse.

**Table 8.1: Existing Site Drainage Conditions – Details of Surface Water Catchments**

Catchment Area	Area (ha)	Description	Discharge Outlet/ Water Flows Toward
A	ca. 12.7	Bare soils, some made ground and hardcore in the eastern part	Infiltrates directly to ground or runs to Ponds A1, A2, A3 & infiltrates there; no external discharge.
B	ca. 6.0	Bare soils, minor recolonising vegetation	Infiltrates directly to ground or runs toward eastern corner; no external discharge.
C	ca. 2.4	Bare ground, some hard-standing areas	Runs toward Pond C, minor infiltration directly to ground. Pond C discharges after settlement to stream by road (tributary of Morell River).
D	ca. 22.2	Mostly grassed, some recolonising vegetation, some bare ground in western part	Infiltrates directly to ground or runs toward western corner; no external discharge.
E	ca. 23.7	Grassed, small amount of scrub along boundary with residence to east (area includes 2.8 ha beside residence); rushes to south of Pond B.	Infiltrates directly to ground or runs toward Pond B; no external discharge.
F	ca. 3.4	Grassed	Infiltrates directly to ground or runs toward south-western corner; some small runoff off-Site.

The existing surface water drainage on the Site can be subdivided into six (6 no) catchments labelled A to F on Figure 8.1. The size of each of these catchments, their ground surface and their discharge outlet, is described in Table 8.1. It can be seen from Table 8.1 that, in essence, little of the rainfall currently falling on the Site leaves the Site footprint.

#### 8.5.1.2 Initial Drainage Works

The proposed initial drainage works, designed to protect groundwater, manage runoff and prevent silting of natural watercourses located downstream of the Application Site, are described below and shown schematically in Figure 8.7.

1. An infiltration swale will be cut southward along the Site boundary from close to Pond A1 (but not connected to Pond A1) through native soils and down to 142 mAOD (Figure 8.7 – View A). This swale will be some 5 metres wide on its base, and the swale will be cut in such a way as to appear like a natural feature rather than like a canal. It was shown during the Ground Investigation works conducted in late 2007 that ca. 15 m of fluvioglacial deposits (sands, gravels, silts and clays) are present along the western boundary of the Site in the vicinity of BH5-07, and ca. 25 m in the vicinity of BH2-07 (see Appendix 6).
2. A berm will be constructed immediately east of the swale, in a cut-and-fill operation. This will form the basis of a visual screening berm between Punchestown Racecourse and the Site.
3. A made ground cofferdam will be constructed across the inlet between Ponds A1 and A2 to allow pumping out of Pond A2 into the infiltration swale. Drains will be constructed, as necessary, to direct runoff away from Pond A2 to Pond A3.
4. Pond A2 will be pumped-out into the infiltration swale (Figure 8.7 – View B).
5. The existing compound, the proposed location of the Inert Waste Processing Area (IWPA), will be dug out so as to accommodate the infrastructure required, and graded so that all runoff is directed to Pond C, the existing silt pond beside the Site entrance (Figure 8.5).
6. Pond A2 will be backfilled with native Site-won free-draining natural materials to an elevation 1 m above winter-high of the water table. Steps 4 to 6 will be carried out concurrently (Figure 8.7 – View B).
7. When Pond A2 has been filled to 1 m above winter-high water table elevation, the infiltration trench will be connected to Pond A1.

8. Drains/infiltration ditches and a visual screening berm will be constructed along the north and western boundary (Figure 8.7 – View C).
9. Pond A3 will be pumped out to the swale/pond feature on the western boundary. Simultaneously, Pond A3 will be backfilled with native Site-won free-draining natural materials to an elevation 1 m above winter-high of the water table (in a method similar to that used at Pond A2).

### **8.5.2 Perimeter and Internal Berms and Embankments**

A visual screening berm will be constructed along the western boundary, as agreed with the Management of Punchestown Racecourse in conjunction with the construction of the ponds/swales and backfilling of some of the ponds as described above. The berm and ponds are shown in plan and conceptual cross-section in Figures 8.4 and 8.8 respectively.

A landscape berm and noise attenuation berms will be constructed on the northern/north-eastern side of the Site. Where necessary, a temporary 3 m high screen mound will be constructed along the eastern limits of the restoration operations to restrict views of the development from the rear of properties on the eastern boundary.

Prior to commencement of restoration works in the southern part of the Site, a screening and noise attenuation berm will be constructed on the southern section of the Site to protect the area which is important to lapwing for nesting and foraging. A suitably qualified person or ecologist will be present during the construction of the berm, to oversee the works. The lapwing will be monitored during the breeding and non-breeding season during the restoration works.

An internal visual screening berm will be constructed on the northern side of the proposed IWPA as shown on Figures 8.5 and 8.6.

All internal earth-fill slopes will be formed at grades no steeper than 1V:2H. All outer slopes will be graded to 1V:2H or shallower. External slopes will be topsoiled, trimmed, and seeded as soon as possible after completion.

The embankments will be constructed with suitable imported material which will include granular and cohesive materials or from site-work materials.

### **8.6 Ongoing Restoration Works**

Source-segregated inert materials (ca. 85%) and on-Site processed and segregated inert wastes will be used at the Site to achieve a final restoration surface. The following is a detailed description of the design of the restoration works.

### 8.6.1 Overview of Design

The potential extent of the placement of inert material and the proposed restoration levels for the restored landform are shown on Figure 8.3. Cross-sections of the side slopes and the completed landform are shown on Figure 8.8.

Excavation cuts and fills will be required to prepare the Site for lining materials and make it ready to accept imported soils etc. Earthworks construction will be ongoing over the life of landfilling activities on the Site.

The infill below the surrounding land surface will range between 3 and 30 metres deep. The maximum level of deposited inert materials will be 168 mAOD.

The edge of the lined area (footprint) of the inert Facility will be ca. 39 ha. Buffer lands will be available for fencing, environmental monitoring installations, Site roads, and surface water drainage systems. The buffer lands will also allow for provision of landscaping berms and other vegetation as previously described.

The buffer lands in the southern part of the Site will be retained as they provide important habitat for lapwing.

### 8.6.2 Lining System

Areas upon which imported liner and materials will be placed will include a base and slope lining system. Best practice for facilities such as that proposed at the Walshestown Pit dictates that a lining system on the base side slopes will be a mineral liner that will comprise a layer of compacted clayey silt (i.e. a compacted clay liner – CCL) a minimum of 1 m thick. The soil liner will have a co-efficient of permeability of less than or equal to  $1 \times 10^{-7}$  m/sec. The existing ground surface will be graded and/or excavated to allow construction of the lining system. Suitable existing in-situ soils will be excavated and re-used to form the liner. Some imported materials may be required to form a liner meeting the specifications.

### 8.6.3 Phasing of Ongoing Restoration Works

The conceptual plan for this Site is to develop the lined inert facility in distinct zones, as identified through a progressive filling and restoration colour system on Figures 8.9 and 8.10.

The southern part of the Site will be screened off prior to the commencement of restoration works (during the non-breeding bird season of 1 September to 1 March), in order to protect lapwing habitat.

The first zones to be restored will be in the vicinity of Ponds A2, A3 and B – with these ponds being backfilled initially with native Site-won free-draining natural materials and then imported materials.

Later zones will be backfilled in stages (bench-style), the first step of each stage being to build a berm 3 – 4 m high. Restoration filling will occur behind the screening berm and continue until such time as it is necessary to start another stage or bench. Any previously unlined ground will be lined before it is filled over, so that as benching progresses lining progresses. Schematic cross-sectional representations of this filling process are shown on Figure 8.10.

The final zone comprises the area of the proposed IWPA and adjoining hardstand. It is assumed for the purpose of this report that the IWPA and associated infrastructure and hardstand will be decommissioned. This area would then be filled and restored to ultimately produce a landform suitable for light agricultural grazing to maintain species rich grasslands, and in keeping with the surrounding landscape.

#### **8.6.4 Surface Water Management Works during and post completion of the Restoration Works**

During the restoration activities and upon completion of the landform there will be a need to manage runoff and prevent silting of natural watercourses located downstream of the Application Site. In order to take consideration of possible increased storm surges (and a possible 5% increase in annual precipitation) due to climate change, surface water management features will be designed to accommodate the volume of water expected in a 1-in-100 year storm of 60 minute duration plus 20% (i.e. 46.44 mm), as used by OPW in flood relief design works (pers. comm. Mr. Tony Smyth, 17 October 2008). The proposed surface water management works are described below.

A perimeter infiltration trench will be constructed at the foot of the screening berm around the Site perimeter to collect rainfall runoff and allow it to infiltrate to ground (Figure 8.4). Falls in this trench will be designed such as to feed water which does not infiltrate to ground toward the swale described previously in Section 8.5.

To prevent ponding in contours on the restored surface and minimise infiltration to the backfilled body, temporary and/or permanent collector trenches will be constructed within zones, as required, to direct water to the perimeter infiltration trench (Figure 8.4).

Storm water will be accommodated in the water feature along the western boundary (combined Pond A1 and constructed swale), where infiltration to ground will occur through the base and sides. Provision for overflow will be installed at an elevation of 144 mAOD, with discharge being by means of a pipe from the northern corner of Pond A1 to the local stream, which is a tributary of the Morell River (Figures 8.3 and 8.4).

The final restoration surface is shown on Figure 8.3. It has been designed, and will be constructed, in such a way that rainfall will shed to the perimeter infiltration trench. The resulting surface water catchments are also shown on Figure 8.3, and their size, a description of their ground surface, and their discharge outlets, are given in Table 8.2. It can be seen from the table that, in essence, little of the rainfall landing on the Site in future will leave the Site footprint, therefore preserving the current water balance of the Site.

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**Table 8.2: Proposed Site Drainage Conditions – Details of Surface Water Catchments**

Catchment Area	Area (ha)	Description	Discharge Outlet/ Water Flows Toward
G	ca. 4.9	Grassed	Runs off to infiltration trench on eastern and northeastern boundaries; fall of trench is northward
H	ca. 3.9	Grassed	Runs off to infiltration trench on northern and northeastern boundaries; fall of trench is toward the surface water management pond
I	ca. 13.0	Grassed	Runs off to the surface water management pond and swale on western boundary & infiltrates there; stormwater overflow at 144 mAOD elevation from north of pond to local stream
J	ca. 2.0	Grassed	Runs off to infiltration trench on eastern boundary; fall of trench is northward
K	ca. 3.8	Grassed (area includes 2.8 ha beside residence to east).	Runs off to infiltration trench on eastern edge of development area; fall of trench is southward
L	ca. 4.1	Grassed	Runs off to infiltration trench on eastern edge of development area; fall of trench is southward
M	ca. 11.5	Grassed	Runs off to infiltration trench on southern and western edges of development area; fall of trench is westward and northward
N	ca. 13.6	Grassed	Runs off to infiltration trenches on southern edge of development area and along western boundary (fall of trenches is westward and northward respectively)
F	ca. 3.4	Grassed	Infiltrates directly to ground or runs toward south-western corner; some small runoff off-Site

### 8.6.5 Capping System

Capping operations will be carried out on an on-going basis once final restoration levels are reached. The purpose of the cap will be to:

- Shed rainfall and minimize infiltration;
- Isolate inert materials from the terrestrial environment; and
- Ensure there is no dust from the Facility in the post-closure period.

The proposed capping system which will be completed over an area of ca. 39 ha is presented in Table 8.3 starting from the surface down.

**Table 8.3: Components of the Proposed Capping System**

Component	Nominal Thickness (mm)
Growth Medium	150
Subsoil	850

### 8.6.6 Material Requirements

The Site footprint and the existing and final restoration contours govern the volume of the material required to complete the restoration works. The final restoration contours are shown on Figure 8.3. The shape and height of the landform, which plateaus at ca.168 mAOD, have been designed based on input from the project engineers, scientists and landscape architects. Capping layers totalling one metre (including minimum 150 mm of growth medium with the balance subsoil) will be placed to complete the final surface of the landform.

The cut-and-fill requirements to form the western swale, surface water pond, berms and IWPA are indicated in Table 8.4.

**Table 8.4 Earthworks Quantities**

Works	Volume Estimates (m <sup>3</sup> )	
	Cut	Fill
Initial Berm and Surface Water Pond/Swale	25,000	143,000
Inert Waste Processing Area	93,000	3,000
Total	118,000	146,000

The computed potential volume of the void formed by the existing and proposed ground levels on Figure 8.8 is approximately 4.2 million m<sup>3</sup>. This volume will include lining and capping layers.

The anticipated tonnage of inert materials that will be imported to fill the ca. 4.2 million m<sup>3</sup> void is ca. 7.6 million tonnes, based on a post-settlement density of 1.8 tonnes/m<sup>3</sup>.

### **8.6.7 Detailed Restoration Master Plan**

The following concepts are included in the restoration master plan for the Walshestown Site (Figure 10.3):

- Permanent Water feature along the common boundary with Punchestown Racecourse. This water feature will also support wintering waterfowl;
- Reconstruct Priest's Hill to provide viewing area for Herdsgarden Leap. This will also support bird watching across the water feature;
- Permanent walking route around the restored Site (southern and western boundaries), which will be an extension of the Pilgrim's Walk from Tipperkevin to Glendalough; and
- Provide a link from the public walking route around the restored area to the Punchestown Racecourse, commonly used by local residents.

## **8.7 Landscaping and Restoration**

### **8.7.1 Introduction**

Final restoration (planting) proposals have been developed on the basis of the following key objectives:

- Final end-use is to provide semi-natural grassland area;
- Encourage wide range of habitats for maximum ecological diversity and its value for wildlife;
- Integrate the final landform into the local landscape;
- To improve the visual quality of the existing Site for surrounding sensitive visual receptors, in particular views from the Punchestown Racecourse; and
- To deliver a high quality planting scheme of lasting benefit.

The plan is described under the following headings:

- Existing and Proposed Habitats (Section 8.7.2);
- Planting and Maintenance (Section 8.7.3); and
- Commitments to Habitat Creation and Retention (Section 8.7.4).

### **8.7.2 Existing and Proposed Habitats**

Habitats on the Site vary in their ecological value, the highest value habitats being the wet grassland in the southern section of the Site, where lapwing (a Red listed species) forage and nest (Lynas *et al.*, 2007). Other habitats that are rated as high and locally important are the exposed sandy slopes which contain Sand martin colonies (an Amber listed species) and the mature hedgerows and treelines that edge the Site as they serve as wildlife corridors linking to the surrounding landscape. The areas of calcareous grassland add diversity to the Site and provide valuable habitat for a variety of species such as orchids and invertebrates. The scrub is dominated by gorse patches and is considered of moderate value.

This Site was previously managed for agriculture, similar to the fields of the surrounding area. The planned restoration offers an opportunity to increase the nature diversity within the local landscape and establish habitats with a greater nature conservation value than the ones that previously existed on the Site. Proposed new habitats include semi-natural grassland, species-rich hedgerows, treelines and scrub areas, while retaining other habitats. These habitats are outlined below.

Proposed species mixes relating to each habitat are detailed in Section 8.7.3.1. The final restoration plan is presented on Figure 10.3.

Proposed nature conservation elements are as follows:

- Existing hedgerows and treelines will be retained where possible. It is vital that the retained hedgerows and treelines are not damaged during the construction/operational phases. A 3 m buffer will be fenced off between the hedgerow and the active restoration area in order to protect the integrity of the hedgerow and associated understorey.
- Existing hedgerow and scrub will be enhanced. Hedgerow design will reflect the local type in both structure and species. Stock will be native and preferably local if possible. For stock-proofing a 4:1 hawthorn to blackthorn mix should be used. The species mix to be used in this case is detailed in Section 8.7.3.1.
- Grassland creation with bare patches will be created. Areas of this habitat are to be created as part of the planned restoration, and managed appropriately for the

development and maintenance of a species-diverse sward. It is envisaged that a combination of light seeding and natural regeneration will allow the establishment of species-diverse grassland. Areas of exposed stone and bare patches will be scattered across the grassland to create a mosaic of habitats for flora and fauna such as basking butterflies and moths as well as for other invertebrates. The grassland will be left to develop for two years and then grazed lightly to maintain a diverse sward.

An area of grassland will be fenced off in the northern part of the Site to allow meadow to develop, it is expected that this area will be grazed to some extent by rabbits, which are currently present on the Site. The different grazing patterns will promote greater diversity within this and other grasslands of the Site.

If grazing is not possible then half of the grassland can be cut each winter (with cuttings removed to prevent additional nutrient input to the soil) to promote the development of short and tall swards, which provide good cover for faunal species (Gilbert & Anderson, 1998).

- Retention of wet improved grassland. The area of wet improved grassland and bare patches in the southern part of the Site will be retained in order to protect the lapwing (a Red listed species). The area will be fenced off and screened by a berm in order to minimise disturbance to the lapwing and other birds using the area. The screening berm will be positioned during the non-breeding bird season (1 September to 1 March) in order to avoid disturbance of breeding lapwing.

Lapwing require two types of habitat – open ground for nesting (bare patches and scrapes) and wet pasture grassland for feeding. Key to successful chick-rearing is the close proximity of these habitats. The current management and grazing regime of the grassland along with the adjacent open bare patches appears ideal for lapwing.

- The retained water feature in the northwestern part of the Site (Pond A1) will continue to offer habitat for those waterfowl species currently using the water bodies on the Site. This pond will continue to be fed from groundwater and surface water. A long narrow ditch/swale will extend from the pond southwards; its water levels will fluctuate and will add to the diversity of wetland habitat on the Site. It is likely that it will become colonised by rushes and provide habitat for species such as Snipe and Moorhen.

### 8.7.3 Planting and Maintenance

#### 8.7.3.1 Plant Species

The plant species chosen for the restoration proposals have been based upon their ecological value, their occurrence in the locality and reliability of establishment under a variety of soil conditions. The proposed plant species would consist of native species of local provenance, where possible, but as a minimum, of Irish provenance. Transplant material of height range 300-600 mm, either cell grown or bare root stock, is most likely to be used.

#### **Hedgerow Mix (double staggered row with 7 no. plants per linear metre):**

<i>Crataegus monogyna</i>	Hawthorn	50%
<i>Prunus spinosa</i>	Blackthorn	25%
<i>Corylus avellana</i>	Hazel	10%
<i>Ilex aquifolium</i>	Holly	5%
<i>Rosa canina</i>	Dog Rose	5%
<i>Euonymus europaeus</i>	Spindle tree	5%

#### **Berms (soil stabilisation mix):**

<i>Agrostis stolonifera</i>	Creeping bent	30%
<i>Festuca rubra</i>	Red fescue	30%
<i>Trifolium pratense</i>	Red clover	25%
<i>Ranunculus repens</i>	Creeping buttercup	5%
<i>Lotus corniculatus</i>	Birds-foot trefoil	5%
<i>Leucanthemum vulgare</i>	Ox-eye daisy	5%

#### **Neutral Grassland seedmix:**

<i>Festuca rubra</i>	Red fescue	10%
<i>Cynosurus cristatus</i>	Crested dog's-tail	30%
<i>Holcus lanatus</i>	Yorkshire fog	6%
<i>Dactylis glomerata</i>	Coltsfoot	6%
<i>Agrostis capillaris</i>	Common bent	20%
<i>Anthoxanthum odoratum</i>	Sweet vernal-grass	5%
<i>Festuca pratensis</i>	Meadow fescue	2%
<i>Lotus corniculatus</i>	Common bird's-foot-trefoil	5%
<i>Plantago lanceolata</i>	Ribwort plantain	2%
<i>Trifolium pratense</i>	Red clover	2%
<i>Bellis perennis</i>	Daisy	2%
<i>Lathyrus pratense</i>	Meadow vetchling	2%
<i>Leucanthemum vulgare</i>	Oxeye daisy	5%
<i>Knautia arvensis</i>	Field scabious	2%
<i>Rhinanthus minor</i>	Yellow rattle	1%

### 8.7.3.2 Planting Techniques

#### *Trees and shrubs*

Tree and shrub species will be planted directly into previously prepared pits incorporating 30gms of approved slow release fertiliser per planting station. Shrub and hedgerow planting will be protected by rabbit-proof guards and staked appropriately.

#### *Semi-natural grassland*

The area to be developed as grassland will comprise subsoil (200mm depth) that will be cross-ripped and sown with a seedmix of simple grasses including creeping bent (*Agrostis stolonifera*), red fescue (*Festuca rubra*) and sheep's fescue (*Festuca ovina*) from indigenous seed sources; areas treated in this manner will become naturally colonised by species from adjacent plant communities (NRA, 2005). **No fertiliser or soil improver** will be used in the scrub or grassland areas.

Bare patches of ground will be left in places throughout the grassland area to create a habitat mosaic and to provide alternative habitat for invertebrates etc. as well as potential nesting areas for ground nesting bird species.

#### *Temporary berms*

Temporary soil berms will be planted with a light grass seedmix as outlined above, in order to stabilise the berms, prevent erosion of soil and also to prevent colonisation by pernicious weed species such as ragwort.

### 8.7.3.3 Maintenance

As a general practice, areas of planting will be maintained in good condition through inspection of rabbit spirals and the making good of any damage to them. Planted areas will be maintained where necessary and all failures or badly damaged plants will be replaced on an annual basis. Seeded areas will be monitored for pernicious weed growth and a consistent sward maintained for its nature conservation interest.

Newly created grassland will be allowed to develop over two years and thereafter some light winter grazing will be sufficient to maintain a diverse sward. Some spot treatment to control pernicious weeds may also be required.

#### 8.7.3.4 Long-term Management

The management objectives aim to create a mosaic of habitats comprising scrub, grassy verges along hedgerow and treelines, semi-natural grassland whose species composition reflects, as far as feasible, the character of similar semi-natural habitats.

The following objectives for each habitat type will be included in the management plan:

- Scrub – Some thinning will be necessary to improve the structure of the scrub; in some areas a dense thicket will be left;
- Hedgerows – These will be managed by cutting and coppicing when necessary (between 1 September and end February);
- Grassland – The grassland areas once established would, without any management, eventually become rank, lose species diversity and become colonised by scrub. Therefore management by light winter grazing is appropriate where indicated in this plan; and
- An area will be fenced off in the northern section of the Site to allow a wildflower meadow to develop, it is envisaged that this area will be maintained by grazing by the residential rabbit population (Figure 10.3).

#### 8.7.4 **Commitments to Habitat Creation and Retention**

This plan has detailed commitments to retain/enhance or create the following habitats:

- Retention, where possible of habitats on the Site including hedgerow, treelines, a water feature and wet agricultural grasslands (for lapwing and other bird species);
- Promotion of nature conservation and a diversity of habitats in the Site including creation of semi-natural neutral grassland with some bare areas, hedgerows, treelines, scrub and wet areas; and
- Monitoring of lapwing during the breeding and non-breeding season over the course of the restoration works.

#### 8.8 **Monitoring Infrastructure**

During the initial construction of enabling work and the following restoration works air quality, groundwater, surface water and noise will be monitored.

All existing monitoring boreholes remaining after completion of the Facility will be retained. At least three down-gradient and two up-gradient monitoring boreholes in the overburden and bedrock will be provided (Figure 19.1).

Surface water quality will be monitored at a select number of locations downstream of the Facility.

## 8.9 Indicative Programme of Work

A preliminary programme for the works described above has been devised. The likely scale of the overall works programme is estimated at about 15 years. The programme from date of grant of permission is provided in Table 8.5.

**Table 8.5: Programme of Development Works at the Walshestown Pit**

Stage	Description	Duration (years)
1	Compliance Reporting	0.25
2	Preparatory Works – set up Site infrastructure and construct perimeter drainage systems and berms	0.75
3	Importation of Materials for Land Restoration	12.5
4	Final Capping and Drainage Works and Decommissioning	1.5
	<b>Total</b>	<b>15.0</b>

## 8.10 Management of the Facility

### 8.10.1 Overview

It is proposed to appoint a person with appropriate experience to oversee the construction, operation and closure of the Facility, including the decommissioning of all temporary works and restoration of all disturbed areas within the licensed Facility. The licensee will be required by conditions of the Waste Licence to appoint a competent person to act as an overall Facility Manager. An Assistance Facility Manager will need to be named to stand in for the Facility Manager during holidays or in case of illness or other reasons of unavailability.

Monitoring of the Facility will be conducted by a person with appropriate experience.

At this early stage in the approval process it is not possible to provide details of designated staff at the proposed Facility. However, Table 8.6 sets out the competence requirements for the key staff.

### **8.10.2 Facility Management Personnel**

The following management structure (Table 8.6) describes the competence requirements of key staff during construction of the proposed facility.

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**Table 8.6: Competence Requirements of Key Staff at the Proposed Facility**

Name	Position	Based	Duties and Responsibilities	Experience / Qualifications
To be confirmed prior to works	Facility Manager	Site	Supervision of operations on Site, management of waste licence conditions, supervisor of Site engineering works and overall management of Site staff. Responsible for the day-to-day running of the Facility as per licence requirements. This includes the operation and control of all abatement systems on Site as per operational and environmental management procedures.	Suitable engineering or similar appropriate qualification. Minimum 5 years waste management experience. Safe Pass Programme FÁS, Waste Management Training Programme, or equivalent.
To be confirmed prior to works	Assistant Facility Manager	Site	Back up person to the Facility Manager in the event of holidays, illness or other reasons of unavailability. Duties will be as indicated for the Facility Manager.	Suitable engineering or similar appropriate qualification. Safe Pass Programme FÁS, Waste Management Training Programme or equivalent.
To be confirmed prior to works	Scientific Officer	Site	Responsible for on Site monitoring and reporting as per the frequency of the waste licence.	Appropriate Scientific Qualification.
To be confirmed prior to works	Weighbridge Operator	Site	Responsible for documentation of all material that arrives at the Site (inspection and recording) and the maintenance of the weighbridge to maintain accurate readings of incoming material.	Safe Pass Programme FÁS.
To be confirmed prior to works	Facility Foreman	Site	Carry out daily Facility-related operations as per operational and management procedures.	Safe Pass Programme FÁS, Waste Facility Operative Training Programme or equivalent.

### **8.11 Health and Safety**

Worked out sand and gravel sites such as the Walshestown Pit can present occupational safety and health risks for workers during restoration activities, as known and unknown safety hazards can be encountered at any stage of site works.

The Walshestown Facility will be designed and constructed in accordance with the requirements of relevant Irish Health & Safety Legislation. Strict safety management systems and a strong safety culture will be in place during the construction and operation of the Facility including the closure and aftercare phase. These systems will ensure compliance with relevant Irish legislation and safe working conditions on the Site.

A preliminary Health & Safety Plan will be developed during the design stage in accordance with the Safety and Health at Work (Construction) Regulations 2006. This will be further developed on appointment of the main contractor in advance of restoration activities commencing. The main contractor will assume the role of Project Supervisor Construction Stage (PSCS) as per the requirements of the aforementioned construction safety Regulations. The Health & Safety Plan will include details on Site arrangements for safety as well as specific information on Site risk assessments.

Employee safety training will focus on increasing site specific hazard awareness, procedures and preventative measures to minimise the risk of a serious incident occurring. Personnel will be equipped with knowledge and skills to recognise the hazards present, how to assess and minimise the risk which will enable them to perform their duties in a manner that does not represent a safety hazard. All personnel on Site will have defined safety responsibilities and accountabilities.

Public safety will be addressed by restricting Site access during construction and operational phases.

The Applicant has a Corporate Safety Statement. A Site specific Safety Statement will be developed as per the requirements of the Safety Health & Welfare at Work Act 2005 and subsequent regulations. This document will detail the safety management on Site as well as provide a comprehensive hazard and risk assessment for all ongoing Site tasks and activities.

### **8.12 Hours of Construction, Operation and Other Restoration Work**

In keeping with EPA Guidance, activity operations shall be confined to the hours between 07.00 and 18.00, Monday to Friday inclusive (excluding Bank Holidays) or as may be agreed with the Planning Authority/EPA, and between 07.00 and 14.00 on Saturdays, with no activities being permitted on Sundays or public holidays.

### 8.13 Plant

It is anticipated that the following plant (Table 8.7) will likely be needed during the initial enabling works:

**Table 8.7: Potential List of Plant**

Plant	Size	Number
Tracked excavators	20 to 35 tonne	4 No.
Mini digger/JCB		2 No.
Tracked low ground pressure bulldozers	D4 and D6	2 No.
Dump trucks	Variety 5 to 25 tonne	6 No.
Compactors	18 tonne dead weight	2 No.
Tractor with water bowser, leachate bowser and fuel bowser		1 No.
Sump and centrifugal pumps	Variety	4 No.
Tower lights		6 No.
Mobile finger screen		1 No.
Mobile crusher		1 No.
Two-way or three-way split screener		1 No.

### 8.14 Waste Management Procedures

#### 8.14.1 Waste Reception

All wastes will be accepted via the Site entrance. Upon arrival, all delivery vehicles shall be directed to the Facility check-in office and weighbridge where the arrival of each load will be recorded. All documentation accompanying the waste and the waste carrier will be inspected, and the nature of the waste will be confirmed by the Weighbridge Operator/Check in Person. A waste transfer note containing the details of the load delivery time, date, tonnage, and carrier's details will be produced at the weighbridge.

An inspection of the haulier's consignment documents will be made by the Weighbridge Operator/Check in Person. If paper work is incomplete the Weighbridge Operator/Check in Person will retain the load until further information is provided. When the Weighbridge Operator/Check in Person is satisfied with the paper work and the origin of the wastes he/she will inform the driver of relevant Site Safety information and direct the driver to the tipping area.

### 8.14.2 Waste Handling Procedures

Restoration of the Site will be carried out in agreement with the EPA and in line with best practice. Restoration will be completed on a phased basis and will involve the filling of cells defined within each vertical stage in maximum 2 to 3-metre lifts with fill slopes no steeper than 1V:2H, to ensure the maximum slope stability. Phasing allows progressive filling and restoration to occur simultaneously. As shown on Figures 8.8 and 8.9 filling will progress in vertical stages and restoration will proceed from west to east. Each lift will be divided into cells in which surface water drainage will be managed. The size of cells will vary within any given vertical stage, but would typically be 1 to 2 ha in area.

Each landfill cell will be notionally subclassified into grids, identified by a unique reference number, in order to identify the specific deposition area of each waste load and build up a 3-D model of each landfill cell. The grid location of each incoming load will be recorded.

Waste will be deposited, inspected and spread in 2 to 3-metre lifts in each cell, with a bulldozer and compactor on Site ensuring waste is positioned and spread as required to ensure maximum cell stability.

### 8.14.3 Summary

A summary of the proposed waste placement procedure is provided below:

1. Cell construction will involve:
  - Preparation of the cell;
  - Laying of cell liner;
  - Testing of the cell liner; and
  - Validation that the cell meets EPA requirements.
2. The cell will be divided into sub-grids and an appropriate referencing system assigned (e.g. C1/D1 refers to cell 1, grid reference D, level 1);
3. Incoming loads will be directed to cell sub-grid;
4. Waste will be deposited by the delivery contractor;
5. Deposited waste will be spread and compacted;
6. Cell will be filled to a height of 3 m and then the next lift in the cell will be constructed until the entire cell has been filled; and
7. Upon completion of the final lift, capping will be applied and the cell restored.

## **8.15 Raw Materials, Substances Preparations and Energy**

### **8.15.1 Diesel**

The annual diesel consumption of the plant proposed for use at the Facility is not currently available as all plant has not been selected. Details will be provided to the EPA upon letting of the contract for the works.

### **8.15.2 Electricity**

Electricity consumption is not currently available as all plant has not been selected. Details will be provided to the EPA upon letting of the contract for the works.

### **8.15.3 Water**

The Site is connected to Kildare Co. Co. mains supply, and potable water will be obtained from this supply. Water for dust suppression and wheel wash will be abstracted from an existing groundwater well on-Site, close to the Facility entrance (see Figure 8.5). This is an historical well, and if supply is found to be not suitable an alternative borehole will be drilled.

### **8.15.4 Herbicides**

The Licensee will furnish to the EPA the nature and quantities of chemicals if and when they are used.

### **8.15.5 Energy Audits**

Energy audits will be undertaken at the Facility as part of the Environmental Management System (EMS) for the Facility. Reference to the appropriate guidance material and reporting of recommendations of the audit will be included in the Annual Environmental Report which will be a requirement under a Waste Licence issued by the Agency.

## **8.16 Potential Emissions from the Facility**

The potential emissions from the Facility during its construction and closure, and post-closure phases are to air, surface water, groundwater and land. The emissions and the environmental media potentially affected are outlined in Table 8.8.

These emissions, mitigation strategies and the potential residual environmental effects are discussed in the relevant sections of the EIS. Mitigation strategies have also been discussed in previous sub sections of Section 8.0.

**Table 8.8: Potential Emissions and Media Potentially Affected**

Potential Emission	Environmental Media Potentially Affected
Dust	Air
Noise from plant and vehicles on Site	Air
Leachate from wastes	Groundwater beneath the Site and adjoining surface water

## 8.17 Potential Environmental Nuisances

The following sections describe the relevant environment; nuisance and mitigation strategies to control or eliminate these nuisances.

### 8.17.1 Bird Control

Birds will not be attracted to the proposed Facility hence no mitigation strategies are required. If birds appear there are various techniques to prevent intrusion that will be considered and implemented as required.

### 8.17.2 Dust Control

In order to ensure that no dust nuisance occurs during any phases of the development a series of mitigation measures and good working practices will be implemented as part of a dust minimisation plan. These measures are outlined below:

- Site roads will be regularly cleaned and maintained as appropriate. Hard surface roads will be swept to remove mud and aggregate materials from their surface;
- Any un-surfaced roads will be restricted to essential Site traffic only. Furthermore, any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions;
- Vehicles using Site roads will have their speed restricted, and this speed restriction will be enforced rigidly. On any un-surfaced Site road and on hard surfaced roads that Site management dictates speed will be restricted to 20km per hour;
- All vehicles exiting the Site will make use of a wheel wash facility, prior to entering onto public roads, to ensure mud and other wastes are not tracked onto public roads;
- Public roads outside the Site will be regularly inspected for cleanliness, and cleaned as necessary; and
- Water misting or sprays will be used as required if particularly dusty activities, (such as capping) are necessary during dry or windy periods.

In addition, the Waste Licence issued by the EPA may include additional measures and a requirement to monitor dust and particulates.

### **8.17.3 Fire Control**

As the wastes are predominantly a mineral soil or broken rockfill, fires arising from these materials are not expected to be an issue or concern. In case of fire relating to offices, plant etc, standard fire prevention and control measures will be as follows:

- Emergency response contact numbers will be posted on prominent positions on the Site (fire service, police, ambulance and other agencies);
- A telephone system on the Site will ensure instant contact with the emergency services;
- A water supply (well or ponds) will be available on the Site;
- Fire hoses and extinguishers will be available on the Site;
- No burning of waste will be permitted on the Site; and
- There will be no unauthorised people allowed access to the Site and there will be a security company ensuring surveillance outside normal working hours.

### **8.17.4 Litter Control**

Litter arising from the wastes to be received is not expected to be a problem as these wastes are expected to be predominantly mineral soils or broken rock. Litter from construction material packaging and the construction offices is a management responsibility and procedures will be put in place to deal specifically with these materials e.g. bins skips, refuse receptacles etc. Littering on the Site by anyone will not be tolerated and will result in disciplinary action. Litter management will include the operation of a litter patrol, which will inspect the Site boundaries and beyond daily and recover all wind-blown litter. All vehicles transporting waste on public roads will be required to have their loads covered.

### **8.17.5 Traffic Control**

The entrance will allow movement of traffic into and out of the Site. Traffic signs will be used at the Site entrance and throughout the Site to control traffic. Speed limits will be imposed within the Facility. A traffic and transport assessment (TTA) is given in Section 9.0 and Appendix 4.

### **8.17.6 Vermin Control**

Vermin control is not expected to be required as none of the wastes are putrescible. Vermin control is a management responsibility and procedures will be put in place to deal specifically with this issue if required. The Licensee will furnish to the Agency the nature and quantities of chemicals used if and when they are used.

### 8.17.7 Road Cleansing

Road cleansing is a management responsibility and procedures will be put in place to deal specifically with this issue. All lorries will go through a wheel-wash prior to exiting the Site. Road cleansing and sweeping will be carried out as required.

### 8.18 Closure, Restoration and Aftercare Management Plan

This is a requirement associated with holding a waste licence issued by the EPA. Licensees are required to compile what is known as a closure plan or Closure, Restoration and Aftercare Management Plan (CRAMP). The plan is usually given as a condition of the licence to be submitted within a certain timeframe.

In the case of the proposed restoration of the Walshestown Pit, the requirement for a Waste Licence is solely for restoration purposes and therefore the restoration of the Site is fully assessed throughout this report. However, the procedure for developing a CRAMP, in accordance with the “*Guidance on Environmental Liabilities, Risk Assessment, Residuals Management Plans and Financial Provision*”, (EPA 2006) is considered in Table 8.9.

### 8.19 References

Council Directive (1999) on the landfill of waste. (99/31/EC)

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**Table 8.9: Summary Preliminary Closure Restoration and Aftercare Management Plan (CRAMP)**

Stage	Activity	Assessment
<b>Closure</b>	Wastes will be stopped from entering the Facility in Year 15.	<p>The type of closure can be categorised as either a Clean Closure or a Non-Clean Closure.</p> <p>Upon cessation of operations and subsequent decommissioning, there will be no remaining liabilities, thus this is considered a “<b>clean closure</b>”.</p> <p>On-going monitoring at the Site will be required as part of the closure process, for a limited period of 5 years post closure.</p>
<b>Decommissioning</b>	The decommissioning of the Inert Waste Facility will take the form of the removal of the non-permanent infrastructure at the Site. All plant equipment and vehicle use will cease and the final capping will be checked.	The activity at the Site will cease except for the on-going medium-term monitoring (5 years).
<b>Restoration</b>	<p>The restoration stage will be undertaken in conjunction with the closure and decommissioning stages. After placement of the capping layer, the subsoil and growth medium will be placed across the capped surface. The final restored levels are shown in Figure 8.3.</p> <p>The restored surface will be developed into a variety of habitats to promote biodiversity, and will include a surface drainage system comprising French drains with perforated pipes. The area will be fenced by enhancing existing dense hedgerows and installing 1.2 metre high post-and-wire fencing where required.</p>	The restoration process will be full and complete, leaving a landscaped finish and ultimately improving the condition of the area both visually and in terms of the reduced health and safety risks. More details on the landscape plan are given in Section 16.0.
<b>Aftercare Management Plan</b>	An aftercare management plan comes in the form of engineering works maintenance, landscape management and potential emission control. It is unlikely that the Facility would ever be surrendered or transferred, thus the responsibility of the aftercare will remain with the Licensee.	Monitoring for 5 years, annual grazing each September.