

## Appendix 2-5 – CEMP



# Bord na Móna

Drehid Waste Management Facility – Further Development

Construction Environmental Management Plan



# DREHID WASTE MANAGEMENT FACILITY – FURTHER DEVELOPMENT

## CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

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Appendix 4.3 – Dust Minimisation Plan



## 1.0 INTRODUCTION

Bord Na Móna is proposing to further develop its existing Drehid Waste Management Facility (WMF) at a site located in Killinagh Upper, Carbury, County Kildare. The Proposed Development comprises the construction of new waste treatment infrastructure to be co-located adjacent to the existing Drehid WMF and will utilise much of the existing infrastructure in place at the site. The description of the Proposed Development is set out in Section 2.2. A planning application for the Proposed Development will be submitted to An Bord Pleanála (ABP) and will be accompanied by an Environmental Impact Assessment Report (EIAR) and Natura Impact statement (NIS).

This Construction Environmental Management Plan (CEMP) has been prepared to outline the proposed management and administration of site activities for the Construction Phase of the Proposed Development, to ensure that all construction activities are undertaken in an environmentally responsible manner. This CEMP summarises the environmental commitments of the construction project, and the measures to ensure compliance with legislation and the requirements of statutory bodies, all as detailed in the EIAR and NIS.

This CEMP has been prepared initially at the planning stage of the project. It will be a live document and will be reviewed and updated, as required, as the projects progresses from planning stage to construction. Upon appointment, the Main Contractor for construction of the Proposed Development will update (and maintain for the duration of the construction of the Proposed Development) this document, to produce the Contractor's CEMP which will account for any additional measures set out in a Grant of Planning Permission or post planning consultation with relevant stakeholders.

The following relevant guidance has been referenced in the preparation of this CEMP:

- Environmental Protection Agency (EPA), *Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (May 2022);
- EPA, *Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects* (November 2021);
- Inland Fisheries Ireland (IFI), *Guidelines on the Protection of Fisheries During Construction Works in and Adjacent to Waters* (2016);
- Construction Industry Research and Information Association (CIRIA), *Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors (C532)* (2001);
- CIRIA, *Control of water pollution from linear construction projects (C648)* (2006);
- CIRIA, *Environmental Good Practice on Site (C741)* (4<sup>th</sup> Edition) (2015);
- CIRIA, *Groundwater control: design and practice (C750)* (2016);
- CIRIA, *SuDS Manual (C697 & C753F)* (2007 & 2015);
- National Roads Authority (NRA) (now Transport Infrastructure Ireland (TII)), *Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes* (2008);
- British Standards Institution (BSI), *BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise*;
- The Institute of Air Quality Management (IAQM) *Guidance on the Assessment of Dust from Demolition and Construction* (2014);
- TII, *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (2011); and
- Greater London Authority (GLA), *The Control of Dust and Emissions during Construction and Demolition* (2014).



## 1.1 SCOPE OF THE CEMP

The purpose of this document is to communicate the key environmental obligations that apply to all Contractors, their sub-Contractors and personnel while carrying out any form of construction activity for the Proposed Development. This CEMP should be read in conjunction with the Planning Documents & Drawings, the EIAR and the NIS.

This CEMP provides a mechanism for ensuring compliance with environmental legislation and statutory consents. It defines the approach to environmental management at the site during construction activity and addresses all relevant environmental aspects of the management of site preparation and construction work within the development works area.

The scope of the CEMP includes:

- All construction elements of the development;
- The proposed implementation and management of environmental controls and mitigation measures during each phase of construction works; and
- A documented process to ensure measures identified through the planning phase of the development will be applied in practice.

At a minimum, this CEMP must contain:

- A statement of the environmental aims and policy objectives of the development;
- Roles and responsibilities of key individuals;
- Environmental management and reporting structure;
- Site management and construction activity details;
- Environmental mitigation measures;
- Environmental awareness training programmes;
- Environmental monitoring programmes and requirements;
- Inspection and auditing programmes; and
- Emergency response plans and procedures for any environmental incidents.

## 1.2 IMPLEMENTATION OF THE CEMP

In terms of overall environmental responsibility, everyone on site is responsible for ensuring that their actions constitute good environmental practice. All site personnel are charged with following good practice and encouraged to provide feedback and suggestions for improvements. All site personnel are also required to ensure compliance with the requirements of the CEMP. Compliance with the CEMP, the procedures, work practices and controls will be mandatory and must be adhered to by the Contractor, all site personnel, and sub-contractors employed during the construction activities. The CEMP will:

- Provide a basis for achieving and implementing the construction related mitigation measures identified in the EIAR and NIS; and
- Promote best environmental on-site practices for the duration of the construction phase.

## 1.3 AIMS AND OBJECTIVES OF THE CEMP

The key aims of the CEMP are:

- To ensure the project is undertaken in accordance with best practice guidance for the management of the environment during construction works;
- To ensure that mitigation measures to protect all aspects of the environment as set out in the EIAR and NIS are put in place;

- To ensure that construction activities are carried out in accordance with all planning conditions for the development; and
- To carry out the works with minimal impact on the environment.

The primary objectives to ensure the above aims are achieved during construction activities are:

- Appointment and delegation of responsibility to an individual for monitoring environmental compliance and adherence to the Contractor's CEMP;
- Updating the Contractor's CEMP on a continuous basis in accordance with regular environmental auditing and site inspections. This will confirm the efficacy and implementation of all relevant mitigation measures and commitments identified in the planning application documentation;
- Providing adequate environmental training and awareness to all project personnel;
- Establishing documented schedules and records for monitoring and inspections;
- Establishing reporting procedures for any incidents on site with potential to impact on the environment;
- Providing opportunities for community feedback and submission of complaints; and
- Adopting a sustainable and socially responsible approach to construction.

## 1.4 REVISIONS TO THE CEMP

This revision of the CEMP has been prepared at the planning stage of the Proposed Development alongside the EIAR, NIS and planning drawings. The CEMP is a 'live' document and will be reviewed on a regular basis to allow any changes to construction programme, activities/operations, or unforeseen issues be incorporated at any stage throughout the project as deemed necessary by the Developer, their agents or relevant authorities. This planning stage CEMP will be provided to the appointed Main Contractor post planning who will have responsibility for updating the document on a continual basis to account for the following:

- Any conditions stipulated in a Grant of Planning Permission;
- Any requirements/issues highlighted through consultations prior to works, for example by the National Parks and Wildlife Service (NPWS), Kildare County Council (KCC) etc.;
- To ensure it reflects best practice at the time of construction; and
- To ensure it incorporates the findings of any pre-construction site investigations.

The Contractor's CEMP will be updated and incorporate any relevant conditions associated with any Grant of Planning for the Proposed Development. This CEMP will be subject to ongoing review (throughout the construction phase of the development), through regular environmental auditing and site inspections. This will confirm the efficacy and implementation of all relevant mitigation measures and commitments identified in the application documentation.

The appointed Contractor is required to include further specific details which are not available at this stage of the project:

- Details of emergency plan including personnel and contact numbers;
- Populate Emergency Contact Details as per Section 5.4;
- Site and traffic signage details; and
- Liaise with relevant stakeholders to agree final details of Method Statements.

The appointed Contractor shall also agree and implement monitoring measures to monitor the effectiveness of the CEMP.

## 2.0 SITE LOCATION AND PROJECT DETAILS

### 2.1 LOCATION OF THE PROPOSED PROJECT

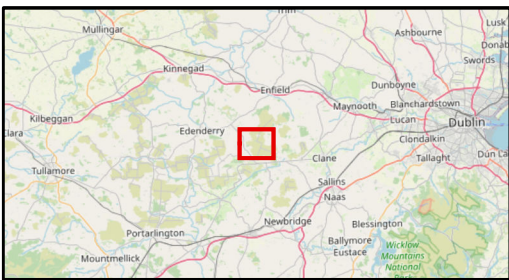
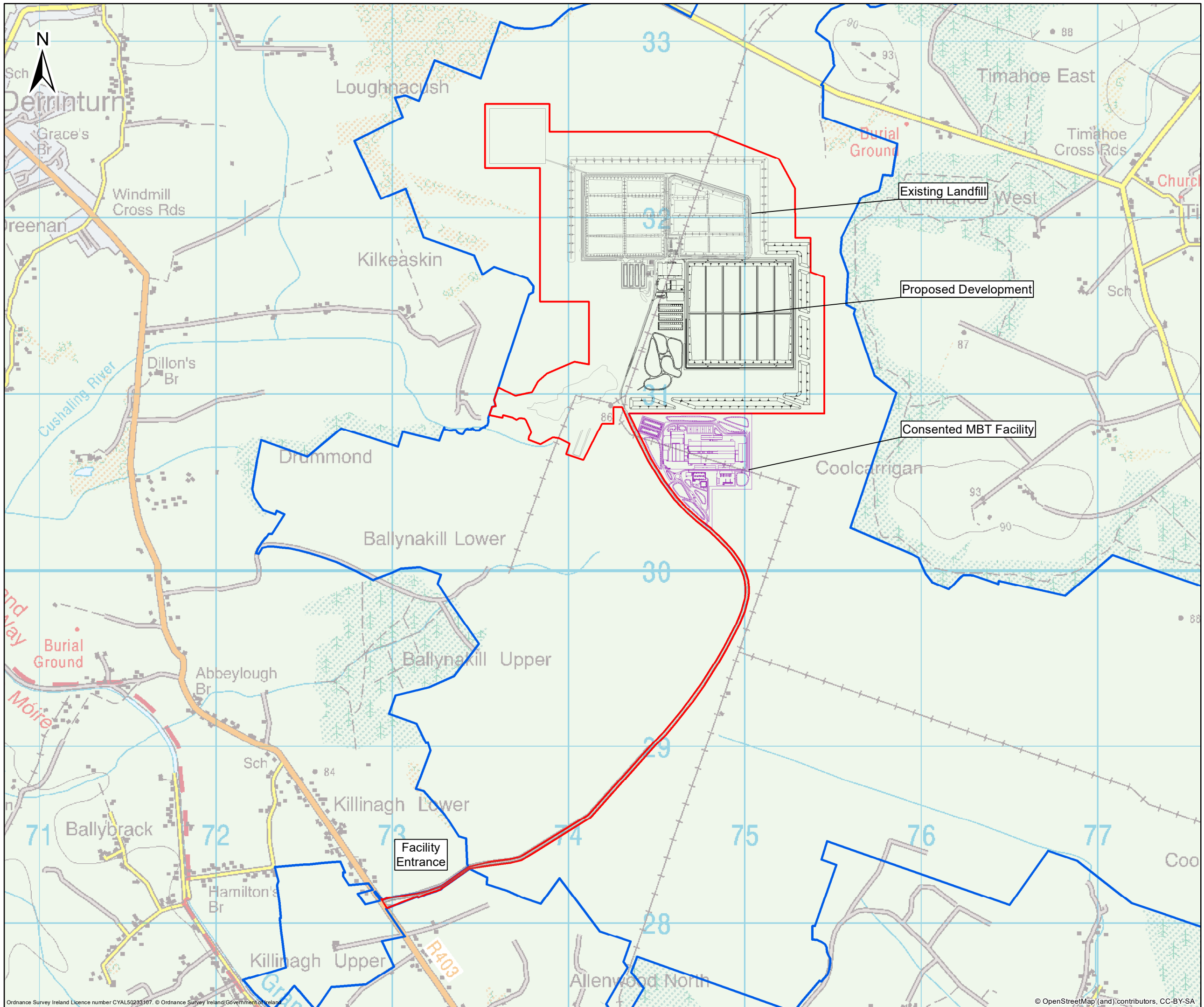
The overall Bord na Móna landholding (2,544 ha), as outlined in blue on Drawing No. 11290-2001 and 2002 of Appendix 2-1 of the EIAR, is located within the County Kildare townlands of Drehid, Ballynamullagh, Kilmurry, Mulgeeth, Mucklon, Timahoe East, Timahoe West, Coolcarrigan, Corduff, Coolearagh West, Allenwood North, Killinagh Upper, Killinagh Lower, Ballynakill Upper, Ballynakill Lower, Drummond, Kilkeaskin, Loughnacush, and Parsonstown.

The application boundary, outlined by the red line on Drawing No. 11290-2001 and 2002 of Appendix 2-1 of the EIAR, is defined as the area in which the application for development is being made and within which all activities associated with the Proposed Development will occur, is confined to the townlands of Timahoe West, Coolcarrigan, Killinagh Upper, Killinagh Lower, Drummond, Kilkeaskin, Loughnacush, and Parsonstown. The activities associated with the Proposed Development will be confined to a landbank of approx. 262 ha within the overall BnM landholding.

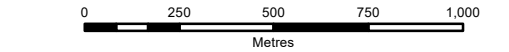
The planning application boundary for the Proposed Development is approx. 2.6 km from the centre of the village of Derrinturn located to the north-west of the site and is approx. 1.7 km from Timahoe Crossroads located to the east. Drawing No. 11290-2000 of Appendix 2-1 of the EIAR shows the position of the site relative to the nearby population centres of Derrinturn, Timahoe, Coill Dubh and Allenwood as well as the surrounding public road network.

The existing and operational waste management facility at Drehid is accessed from the R403 Regional Road via a dedicated entrance and private 4.8 km long access road. This entrance and road will also be used to access the Proposed Development from the public road network. The R403 runs north-west to south-east around the overall Bord na Móna landholding as shown in Figure 2-1. The R403 joins with the R402 at Carbury to the north-west of the site and joins to the R407 in Clane to the east of the site. The R402 links Edenderry and Enfield connecting to the M4 Dublin to Sligo Motorway on the outskirts of Enfield. The R407 links Naas to Kilcock and also links to both the M4 and the M7 (Dublin to Limerick Motorway). The M4 is located approximately 9 km to the north of the Proposed Development and the M7 is located approximately 17 km to the south-east.

The footprint of the Proposed Development is primarily located to the east of the existing private access road and south of the existing landfill infrastructure as shown on Drawing No. 11290-2010 of Appendix 2-1 of the EIAR.



- Legend**
- Planning Application Boundary
  - Bord na Móna Ownership Boundary
- Site Layout**
- Proposed Site Layout
  - Existing Landfill
  - Consented MBT Facility



- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
  2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
  3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
  4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

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|-------|------------|-------------|------|-------|
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Client:  
**Bord na Móna**

Project:  
Drehid Waste Management Facility Further Development

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Facility Master Plan (OSI)

Scale @ A3: 1:20,000

Prepared by: S.Pezzetta      Checked: R.Hunt      Date: May 2023

Project Director: D.Grehan

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Figure 2-1 Draft: A



### 2.1.1 Designated Sites

There are no European sites located within or adjacent to the Proposed Development site. The closest European site is Ballynafagh Lake SAC (Site Code: 001387), which is located approximately 5.3 km south-east of the Proposed Development. The Proposed Development site is located within the Barrow Water Framework Directive (WFD) Catchment. The Proposed Development site is also hydrologically connected to three European sites; the River Barrow and River Nore Special Area of Conservation (SAC) (002162), via the Cushaling River (approximately 40 km downstream), and the River Boyne and River Blackwater SAC (002299), and the River Boyne and River Blackwater Special Protection Area (SPA) (004232) via the Mulgeeth Stream and Blackwater (Longwood) (approximately 30 km downstream). Further information on European sites within the Zol of the Proposed Development is outlined in Section 6 of the NIS. The sites and their Qualifying Interests/Special Conservation Interest are listed in Chapter 6 (Biodiversity) of the EIAR (Table 6-7) and illustrated on Figure 6-2 of the EIAR.

Three Natural Heritage Area (NHAs) were identified within the vicinity of the Proposed Development site. These are listed Chapter 6 of the EIAR in Table 6-7 and illustrated on Figure 6-2. No viable source-pathway-receptor link exists between the Proposed Development and the three NHA's. There are 21 no. proposed Natural Heritage Areas (pNHAs) located within the vicinity of the Proposed Development and the three NHAs.

Other sites of nature conservation within the or vicinity of the Proposed Development site include:

- Pollardstown Fen Nature Reserve c.15 km south of the Proposed Development site - no source-pathway-receptor link was identified between the Proposed Development and Pollardstown Fen Nature Reserve or any other Nature Reserve;
- The Pollardstown Fen RAMSAR (Site Number: 474) c. 15 km south of the Proposed Development site - no source-pathway-receptor link was identified between the Proposed Development and Pollardstown Fen RAMSAR site or any other RAMSAR site;
- The Ballynafagh Lake (Blackwood Lake) Wildfowl Sanctuary (WFS-30) c. 7 km east of the Proposed Development site - no source-pathway-receptor link was identified between the Ballynafagh Lake (Blackwood Lake) Wildfowl Sanctuary or any other wildfowl sanctuary.

There are no National Parks located within 15 km of the Proposed Development site and no source-pathway-receptor link was identified between the Proposed Development and any National Park.

## 2.2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The development will consist of an extension of the existing Drehid WMF to provide for the acceptance of up to 440,000 TPA of non-hazardous waste material, comprising:

- Increase in acceptance of non-hazardous household, commercial & industrial and C&D waste at the existing landfill from the currently permitted disposal quantity of 120,000 TPA to 250,000 TPA until the permitted void space in the existing landfill is filled and no later than the currently permitted end date of 2028;
- Development of extended landfill footprint of approximately 35.75 ha to accommodate the landfilling of 250,000 TPA of non-hazardous household, commercial & industrial and C&D waste for a period of 25 years to commence once the existing landfill void space is filled. The new landfill will have a maximum height of approximately 32 m above ground level (115.75 mAOD);

- Provision, as part of the extended landfill infrastructure, for 30,000 TPA of contingency disposal capacity for non-hazardous waste, to be activated by the Planning Authority only as an emergency measure, for a period of 25 years;
- Development of a new Processing Facility, for the recovery of 70,000 TPA of inert soil & stones and C&D waste (rubble) and use of same for engineering and construction purposes within the site, including as engineering material in the landfill;
- Increase in acceptance of waste at the existing Composting Facility from 25,000 TPA to 35,000 TPA and removal of the restriction on the operating life of the Composting Facility contained in Condition 2(2) of ABP Ref. No. PL.09.212059;
- Extension to, and reconfiguration of, the existing Composting Facility to provide for a new MSW Processing and Composting Facility with an additional capacity of 55,000 TPA (giving a combined total for the MSW Processing and Composting Facility of 90,000 TPA), allowing for the combined facility to accept both MSW and other organic wastes;
- Construction of a new odour abatement system at the existing Composting Facility including two emissions stacks to a height of 17 m above ground level;
- Construction of a new odour abatement system as part of the new MSW Processing and Composting Facility including two emissions stacks to a height of 17 m above ground level;
- Development of a new Maintenance Building with staff welfare facility, office, storage and a laboratory;
- Installation of a new bunded fuel storage area to the rear of the new Processing Facility for the recovery of soil & stones and C&D waste (rubble);
- Construction of two new permanent surface water lagoons and one new construction stage surface water lagoon;
- Construction of a new integrated constructed wetland (ICW) area comprising five ponds;
- Car-parking provision for operational staff;
- Landscaping and screening berms; and
- All associated infrastructure and utility works necessary to facilitate the Proposed Development and the restoration of the facility following the cessation of waste acceptance.

Further discussion on the description set out above is provided in Section 2.2 of the EIAR.

There will be no significant change in the nature of the waste types accepted at the Proposed Development from those which are currently authorised and accepted at the existing Drehid WMF. Only non-hazardous waste types will be accepted at the facility, the nature of which is described further in Section 2.2.4 of the EIAR. No hazardous waste will be accepted at the facility.

The Proposed Development works primarily comprise a continuation of the current operations at the existing facility with changes in the quantity and duration of waste acceptance as per above. A detailed description of all elements of the Proposed Development is set out in Chapter 2 of the EIAR. The main waste handling aspects of the Proposed Development are further described in the following sections.

### ***2.2.1 Additional Landfill Capacity***

It is proposed to provide additional capacity for the landfilling of up to 290,000 TPA of non-hazardous wastes for disposal for a period of 25 years. This further capacity will be provided by way of new landfill infrastructure at the location as shown in the Facility Master Plan.

In addition to the above 290,000 TPA, it is proposed to accept and recover a further 70,000 TPA of inert waste in the form of soil & stones, C&D material and crushed glass for beneficial re-use (recovery) as landfill construction and engineering materials.

Based on a blended density of the above waste types of c. 1.19 tonnes/m<sup>3</sup>, it is envisaged that there will be a requirement for c. 285,000 m<sup>3</sup> of landfilling capacity for each of the 25 years. This equates to c. 7,150,000 m<sup>3</sup> (c. 8,500,000 tonnes) over the 25-year operational lifetime of the new landfill.

The landfill has been designed with a void space capacity of 7,250,000m<sup>3</sup> which provides a buffer capacity for variances in waste density and the utilisation of contingency capacity during the lifetime of the facility. From discussions with the Regional Waste Management Planning Offices (RWMPO's), it is not anticipated that the contingency capacity will be required every year and it may never be required. Therefore, it is prudent to allow some buffer capacity in the landfill design for the contingency allowance, but not to allow for the total contingency volume for each of the 25 operational years.

Further detail on the additional landfill capacity is set out in Section 2.2.1 of the EIAR.

### ***2.2.1.1 Landfill Phasing***

The proposed landfill infrastructure, as outlined on Drawing No. 11290-2003 and 11290-2010 of Appendix 2-1 of the EIAR, will cover an area of approximately 35.75 ha. The landfill is designed to be constructed in 12 no. Phases, which are numbered from Phase 16 to Phase 27 to maintain consistency with the existing infrastructure on site and ease of reference for operational staff.

Prior to the construction of the landfill, all vegetation will be cleared, and the ground will be stripped of peat and topsoil. The floor of the landfill will be graded in accordance with the required formation levels as shown on Drawing No. 11290-2011 of Appendix 2-1 of the EIAR. After deposition of waste, the final capping will be installed, and full restoration will take place.

The basal liner for each phase will be constructed in conjunction with the deposition of waste into previous phases which will allow for consistent and efficient placement of waste without any lack of capacity arising. Estimated dates for the commencement of waste deposition, temporary capping, and final capping in each of the phases of the proposed new landfill are set out in Table 2-11 of the EIAR. The actual phasing of construction and the placement of waste in the new landfill will be dependent on the timing of the issuing of a Grant of Planning Permission, revised Industrial Emissions (IE) Licence, and on the rate of landfilling over the lifetime of the facility.

The development of each landfill phase will typically be as follows:

- Surveys, site clearance and peat stripping – 7 months
- Construction – 12 months
- Operation/deposition of waste – 2 to 2.5 years (2.1 years used in modelling exercises)
- Temporary/Intermediate capping – 20 – 24 months
- Final capping – 18 months

An outline programme for construction of the Proposed Development is provided in Section 3.1.

### ***2.2.2 Increased Composting Facility Intake***

The Proposed Development includes increasing the quantity of biowaste accepted at the existing Composting Facility from the currently permitted 25,000 TPA up to 35,000 TPA (an increase of 10,000 TPA). This increase can be catered for within the existing composting building without the need for any building footprint increase. The additional 10,000 TPA throughput can be facilitated by optimising the existing operations and intensifying use of the existing infrastructure within the building. This proposal also includes the removal of the operational lifetime restriction on the Composting Facility which is currently aligned to the operational lifetime of the existing landfill, i.e., 2028.

Waste accepted at the existing Composting Facility comprises organic fines and source separated organic waste from municipal, commercial and industrial sources. The same waste types will continue to be accepted at the Composting Facility under this current proposal.

### ***2.2.3 New MSW Processing and Composting Facility***

It is proposed to develop a new MSW Processing and Composting Facility at the site to cater for the acceptance of MSW material which has not been subject to any pre-treatment previously. This facility will be constructed as an extension to the existing Composting Facility and will utilise existing road access and utility infrastructure at this location. The new building and the existing Composting Facility will be accessible internally, as shown on Drawing No. 11290-2081 of Appendix 2-1 of the EIAR, to allow the ease of materials within the building. The new extension will have a processing capacity of 55,000 TPA giving the overall building a combined capacity of 90,000 TPA.

MSW will be delivered to the new facility in a combination of refuse collection vehicles (RCVs) and bulk trailers and will be offloaded in the reception hall. The incoming waste will be subject to a bag opening process in the reception hall and then placed in concrete tunnels within the building for approximately 12 days for drying. The waste will then be unloaded from the tunnels and subjected to screening and sorting to segregate recyclable materials, refuse derived fuel (RDF) / solid recovered fuel (SRF) feed materials and an undersize (<60 mm) fraction. As per Section 2.2.2 and Drawing no. 11290-2081 of Appendix 2-1 of the EIAR, this sorting of recyclables and RDF / SRF will be carried out in a reconfigured area within the existing building. Recyclables and RDF / SRF material will be removed from the site in bulk trailers for further processing off-site. The undersize fraction, which is typically referred to as organic fines, will be subject to further biological treatment in dedicated composting tunnels. 13 no. new composting tunnels will be provided for in the building extension in addition to the 12 no. composting tunnels currently in place in the existing building. The composting of the organic fines in the new building will be identical to the activities currently carried out in the existing building. Once constructed, the overall building will operate as a combined MSW Processing and Composting Facility with capacity for 90,000 TPA of suitable wastes.

### ***2.2.4 Soil & Stones and C&D Waste (Rubble) Processing Building***

A new processing building for inert soil & stones and C&D waste (rubble) (hereafter referred to as Soils Processing Building) with a capacity of 70,000 TPA will be constructed at the location as shown on Drawing No. 11290-2010 of Appendix 2-1 of the EIAR. This building will be used for the acceptance, screening and temporary storage of waste soil & stone and C&D rubble prior to placement in the new landfill or use as engineering fill, where possible. The provision of this building will allow for a dedicated area to sort the incoming materials and to recover suitable materials which can be used in the landfill and the wider facility for engineering purposes, such

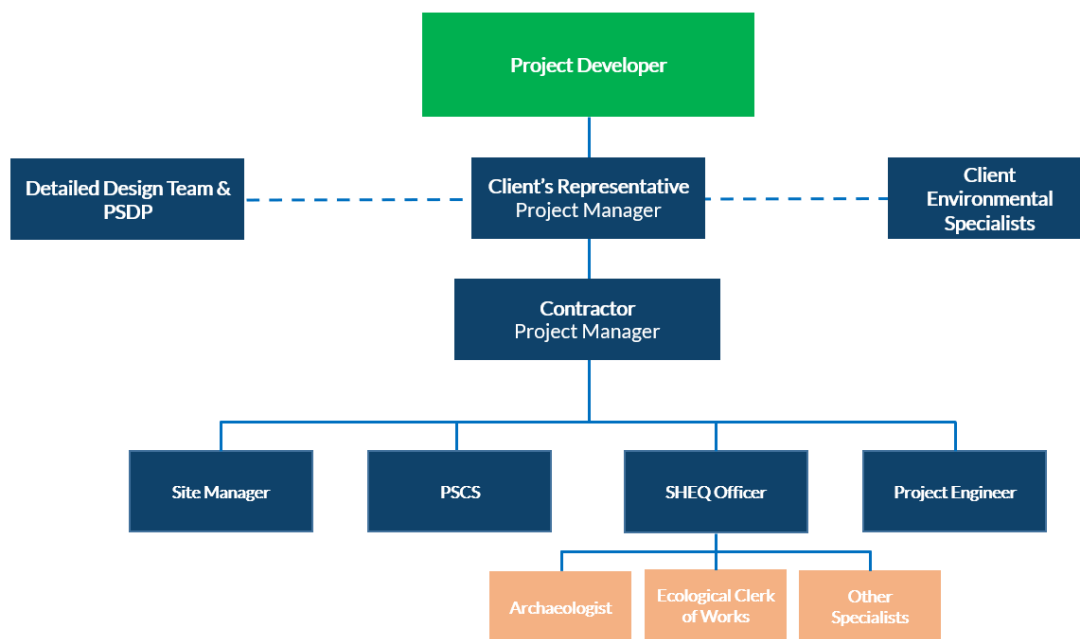


as construction of roads, turning areas or tipping areas or for use as daily/intermediate/final capping.

Screening equipment located within the building will remove stones from the incoming material to produce a clean soil material. Subject to passing Waste Acceptance Criteria (WAC) testing for inert soil, this material can be recovered for use as capping and/or cover material and would reduce the requirement to import materials specifically for this purpose. Similarly, C&D rubble accepted at the facility will be routed to this building for screening and production of recycled aggregate. It is envisaged that approximately 70,000 TPA of soil & stones and C&D rubble will be processed in this building. In relation to recycled aggregate, the EPA have issued a consultation on *Draft End of Waste Criteria for Recycled Aggregates* which closed in February 2023. This is being developed to establish a formal protocol for reclassifying appropriate wastes as non-waste material in accordance with the provisions set out in Article 28 of the *European Communities (Waste Directive) Regulations 2011*. These criteria and guidance, when implemented, will provide a protocol of the handling, treatment and use of waste materials to create a recycled aggregate. Once End of Waste status has been achieved for the material, it ceases to be waste and can be used for engineering purposes.

### 2.3 KEY ROLES AND RESPONSIBILITIES

An indicative organisational chart showing the key roles during the construction stage is shown in Figure 2-1. Additional roles may be developed by the appointed Contractor depending on the element of works under construction and the number of persons on site during construction works.



*Figure 2-2 – Indicative organisational chart for construction of the Proposed Development*

The Main Contractor’s Project Manager will have overall responsibility for environmental management and compliance during the construction works. He/she will be supported in this role by a SHEQ Officer, or Environmental Officer as appropriate, who will liaise directly with the relevant regulatory bodies and stakeholders throughout the duration of construction activity. Additional specialist input will be required from an Ecological Clerk of Works (ECoW) and Archaeologist, at a minimum, with input from other specialist disciplines, as required.

### **2.3.1 Project Manager**

A suitably qualified Project Manager (or Construction/Site Manager) will be appointed by the contractor for the duration of the construction period. The Project Manager will have overall responsibility for the organisation and execution of all related environmental activities as appropriate, in accordance with regulatory and project environmental requirements.

### **2.3.2 Safety, Health, Environment and Quality (SHEQ) Officer**

A suitably qualified Safety, Health, Environment and Quality (SHEQ) Officer will be appointed by the contractor for the duration of the construction period. The SHEQ will ensure compliance with all relevant Health and Safety regulations, environmental regulations, and quality control on-site during the construction stage. The SHEQ will be on-site full time during the construction phase.

The SHEQ Officer, or other suitably qualified person, will fulfil the role of Project Supervisor Construction Stage (PSCS) in accordance with the requirements of the *Safety, Health and Welfare at Work (Construction) Regulations 2013*, as amended and will liaise with the Project Supervisor Design Process (PSDP) in the discharge of their duties under the Regulations.

### **2.3.3 Environmental/Ecological Clerk of Works (ECoW)**

A suitably qualified ECoW (or Project Ecologist) will be appointed by the Contractor. The ECoW will be experienced in the management of peatland habitats and will oversee all construction works and monitor any possible sources for impacts for the duration of the construction programme. The ECoW will ensure the construction phase of the Proposed Development will be undertaken in strict agreement with the methods prescribed within this CEMP and will have the power to stop the works in case any activities/works are not compliant.

### **2.3.4 Project Archaeologist**

The Project Archaeologist will report to the Project Manager/SHEQ Officer and will be responsible for overseeing all aspects of ground disturbance associated with the Proposed Development. The Project Archaeologist will undertake probing and testing at the site of known archaeological features and will monitor the site clearance works to identify any previously unknown features at the site.

## **2.4 CONSTRUCTION SITE MANAGEMENT**

### **2.4.1 Safety and Security**

All construction activity will be carried out in accordance with the requirements of the *Safety, Health and Welfare at Work Act 2005* as amended and Regulations made under this Act.

Key risks associated with the Proposed Development works include:

- Working in proximity to an active waste facility;
- Traffic movements from construction activity as well as operational activity;
- Deep excavations and works in peat environment;
- Works adjacent to water and the requirement to manage water levels;
- Risks from the presence of biological substances (waste materials).

A Preliminary Health and Safety (H&S) Plan covering all aspects of the construction of the Proposed Development will be prepared by the PSDP in advance of the commencement of

construction. This Preliminary H&S Plan will then be provided to the appointed Contractor to further develop into a Construction Stage H&S Plan to be implemented throughout the construction phase.

Evidence of completion of construction safety training, typically in the form of a Safepass Card, will be required for all personnel prior to commencing work on site. A record of Safepass Cards and personnel approved for entrance to site will be completed as part of a site induction process. The Contractor's H&S Plan will detail the site induction and access requirements. Where relevant, equipment operators or specialist works will require personnel to hold a valid Construction Skills Scheme Card. All equipment and machinery used on site will be appropriately certified for its intended purposes. The Developer will ensure that only competent contractors are appointed to carry out the construction works on the site.

Public safety will be addressed by restricting site access during construction works and the erection of security fencing as appropriate at construction works areas. There will be only one entrance to the construction works area which will be controlled by the contractor. Site security measures will be checked daily and repaired immediately where any defects are identified.

Members of the public are not permitted to access the facility without approval. Any unauthorised access via the private road will be stopped at the weighbridge where they will be prevented from entering the facility. The weighbridge operators will evaluate any incoming visitors and deny access as appropriate.

#### ***2.4.1.1 Covid-19***

The emergence of the Covid-19 virus in Ireland in the early part of 2020 presented a new human health risk and concern amongst the general public across the country and including the Proposed Development area. At the time of preparation of this report, there are no specific public health restrictions in place in response to Covid-19. The Developer and the appointed contractor will monitor the prevailing Government public health advice and take actions as directed to protect operational staff, construction staff and the general public.

Any measures put in place to protect public health by the Developer will be set out in the Preliminary H&S Plan and the appointed contractor will be required to comply with such measures under the terms of their Contract with the Developer.

#### ***2.4.2 Site Access***

Access to the Proposed Development will be via the existing permitted site entrance, located on the R403 Regional Road. The existing access comprises a T-junction from the R403 to a dedicated entrance to the Drehid WMF. The facility entrance is clearly identified with stone walls and signage. The site access is controlled using metal gates and is monitored by security from the weighbridge kiosk.

From the entrance gate, access to the waste facility is via an existing 4.8 km two-lane private access road. This access road will only be used by vehicles travelling to and from the Drehid WMF, including operational traffic to the existing facility and construction traffic to the Proposed Development.

The provision of the proposed new landfill and buildings will require some alterations to the existing internal road layout. These alterations will be kept to a minimum and will facilitate safe and efficient traffic flows at the facility when the new infrastructure, primarily the new landfill, is under construction and operational.

The revised arrangements include the addition of a new queuing lane for incoming HGVs in advance of the weighbridge, a new perimeter road around the new landfill footprint and new roads providing access to the MSW Processing and Composting Building, Soils Processing Building, Maintenance Building, contractor's compound and quarantine area. The proposed road layouts provide maximum separation between operational and construction HGV traffic.

The revised internal road layout is shown in Drawing No. 11290-2045 of Appendix 2-1 of the EIAR and includes provision of signage and road markings for the proposed routing of HGV movements and staff movements within the facility during both construction and operations. The traffic routing will be subject to ongoing review by facility operations, often at the start of construction of a new landfill phase, to ensure that traffic management at the facility is carried out safely and efficiently. If there are any issues identified, the facility management team will investigate and implement changes, in consultation with construction contractors, where applicable.

Appropriate signage on the access road and at the Proposed Development will direct waste hauliers, visitors and employees to the designated areas; signage is discussed further in Section 2.4.4 of this CEMP.

Members of the public are not permitted to access the facility without approval. Any unauthorised access via the private road will be stopped at the weighbridge where they will be prevented from entering the operational facility. The weighbridge operators will evaluate any incoming visitors and waste contractors and deny access as appropriate.

### ***2.4.3 Traffic Control and Parking***

All traffic to the Proposed Development will access the facility by turning into the Bord na Móna landholding from the R403 using the existing entrance and travelling along the existing private access road to the weighbridge. Construction traffic will use this entrance along with the existing operational vehicles. There is sufficient space off the public road for incoming vehicles to access the site such that there is no risk of queuing on the public road network. There is also an emergency lay-by area with space for temporary HGV parking in the event that a vehicle is trying to access the site outside of permitted hours and the gates are closed.

Incoming vehicles will travel along the access road until they reach the construction compound entrance which is located just prior to the weighbridge location. Construction vehicles are not required to cross the weighbridge and will avoid passing through or beside the weighbridge so as to limit crossover with operational vehicles. The addition of a third lane on the private access road in advance of the weighbridge, provides a second incoming traffic lane. Waste vehicles incoming and awaiting approval to proceed onto the weighbridge for recording and checking of documentation will be required to use a queuing lane. Waste vehicles will stay in this queuing lane until they are permitted to proceed onto the weighbridge. Refer to Section 2.2.7.5 of the EIAR in respect of operational traffic control.

The middle lane of the private access road will be an incoming lane for use by Bord na Móna staff, visitors and small vans accessing the facility as well as construction traffic. Construction traffic will proceed along the middle lane before turning right into a dedicated contractor's compound area in advance of the weighbridge. Refer to Drawing No. 11290-2046 of Appendix 2-1 of the EIAR for the layout and position of the new access road lane and contractor's compound.

The entrance from the access road to the contractor's compound will be for construction traffic only and will be signed as such. The contractor's compound will include a car/van parking area

as well as a large yard for material storage, HGV parking and welfare facilities. Further details on the construction compound are set out in Section 3.4.

#### **2.4.4 Signage**

Warning signs will be erected at the construction works areas clearly stating that construction works are underway. A notice board will be erected at the site entrance and at the construction compound gate(s) with information on the contact details for site management, PPE requirements for the site and any other information deemed necessary in accordance with the Contractor's H&S Plan. Additional signage will be added at high-risk areas such as deep excavations or areas of soft ground conditions.

Signage will be erected along the private access way to warn waste hauliers that construction traffic is present in the area. In advance of the weighbridge, signs will direct construction traffic to the dedicated entrance to the construction works area. Speed limit signs are erected along the existing private access road warning drivers of a 50 km/h speed limit and further speed limit signs will be erected within the construction works area, as required.

Signage will also be erected as a reminder to concrete delivery drivers that concrete truck wash-out is not permitted on-site and identifying the area(s) where concrete chute wash-out is permitted.

Any ecological or archaeological exclusion zones will also be demarcated, and signs erected identifying the location of protected features.

## **2.5 CONSTRUCTION STAFF**

It is anticipated that there will be 40 – 50 construction staff on site during peak activities. Following the completion of the initial construction works, it is estimated that future landfill phases will have 15 no. construction staff on site during peak activity.

## **3.0 CONSTRUCTION MANAGEMENT**

### **3.1 CONSTRUCTION PROGRAMME AND SEQUENCING**

On receipt of a successful Grant of Planning Permission, pre-construction works will commence at the site. This will include the commissioning of pre-construction surveys, including ecological surveys and archaeological surveys, as well as detailed design development, planning compliance submissions and preparation of Tender documents for the construction of the Proposed Development. For the purposes of this CEMP and for establishing timelines as part of the EIAR, Q1 2024 has been taken as an indicative date for the receipt of planning approval and Q3 2024 as an indicative date for receipt of a revised Industrial Emissions (IE) Licence from the EPA.

The entire landfill infrastructure will not be constructed at the same time and will be developed on a phased basis over a period of c. 25 years. This reflects how the existing landfill has been developed at the site since 2006 and allows for the gradual construction of new void space to facilitate the demand from the waste market. The new landfill comprises 12 no. phases and it is anticipated that new landfill phases will be developed every 2 to 2.5 years. Each phase of the landfill is anticipated to take 18 months to construct allowing for pre-construction surveys, vegetation clearance, peat stripping, excavation/earthworks, drainage management and construction of the engineered liner.

The initial construction works (Construction Stage 1) will comprise Phase 16 of the landfill (including undercell drainage system), the MSW Processing and Composting Building, the Maintenance Building, the Soils and C&D Processing Facility, contractor's yard, surface water management infrastructure and associated works. Once construction of Phase 16 of the landfill is completed, deposition of waste in the void space will commence following approval of the as-built construction details by the EPA. Waste placement in Phase 16 will be ongoing for 2 to 2.5 years during which time temporary/intermediate capping will be placed over filled areas. On completion of temporary/intermediate capping of the last section of Phase 16, works will commence on final profiling and installation of the final capping.

To ensure there is always sufficient void capacity available at the site and to accommodate the contingency capacity allowance as required by the RWMPOs, the development of new landfill infrastructure is planned such that each new phase is constructed and approved to accept waste at least six months prior to the previous phase reaching its void space capacity. As such, construction of each new phase will commence approx. two years after the previous phase.

Figure 3-1 sets out an outline programme for the construction of the Proposed Development showing the key steps in the initial construction works which include Phase 16 of the landfill. The indicative timeline for the development of Phase 17, 18 and 19 is also shown to illustrate the gradual nature of the landfill development. The commencement of waste placement in Phase 16 of the new landfill infrastructure is contingent upon the filling of available void space in Phase 15 of the existing landfill. At the current rate of filling, the available void space in Phase 15 is expected to be exhausted in 2026. This line item in the programme in Figure 3-1 includes a 'float' allowance to ensure the new landfill infrastructure is developed in adequate time prior to completion of waste placement in Phase 15.

The initial construction works (Construction Stage 1) comprise an area of 13.9 ha which is approx. 22% of the total new development footprint area. Subsequent construction of each phase of the landfill will have an area of approx. 3.5 ha allowing for the landfill footprint as well as extending drainage, utility, leachate collection, gas collection and road infrastructure as the landfill footprint expands. Figure 3-2 illustrates the gradual development of the landfill footprint from the initial construction works and through each of the subsequent landfill phases.

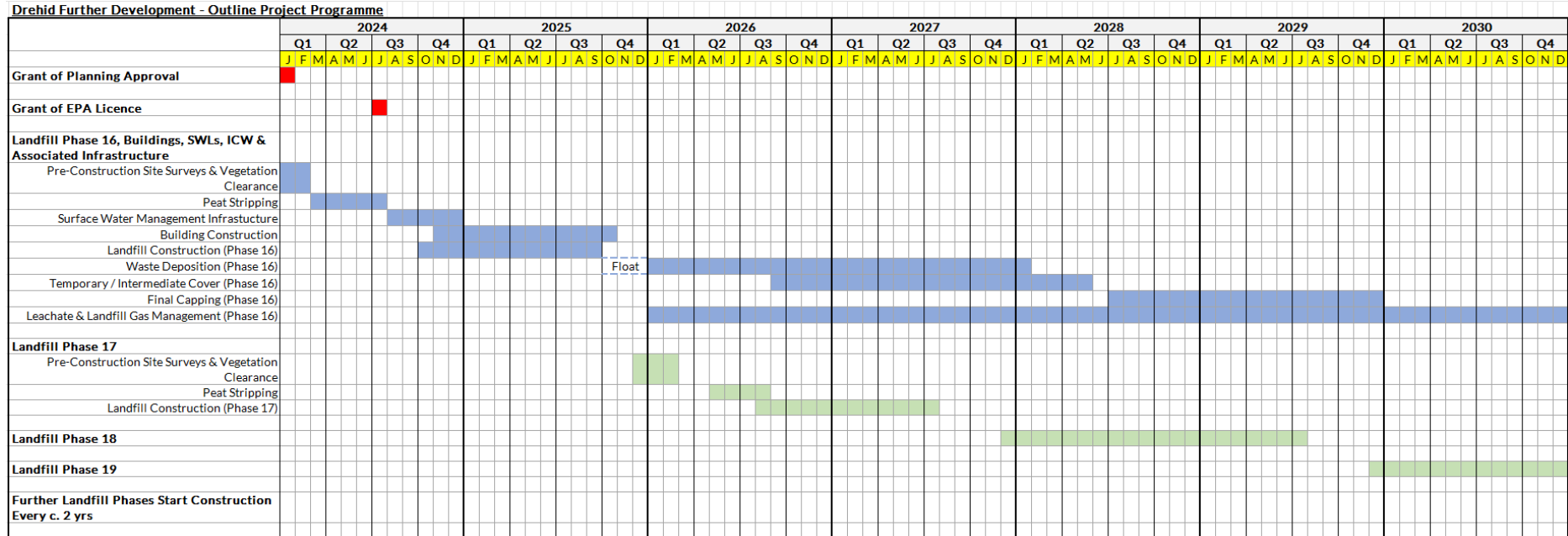


Figure 3-1 - Outline programme for construction of the Proposed Development



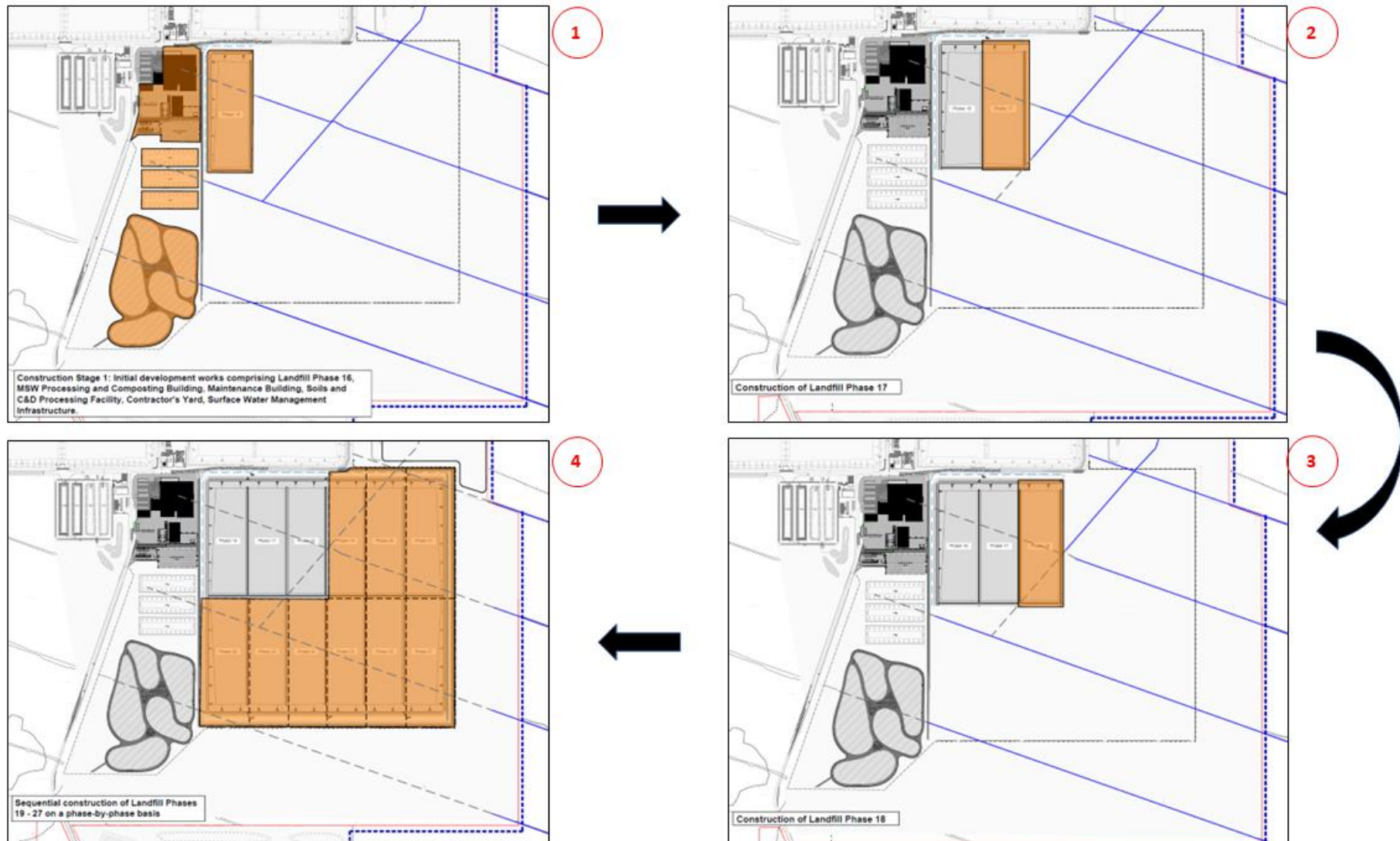


Figure 3-2 – Illustration of the gradual development of proposed infrastructure



### 3.1.1 Construction Hours

Construction works will take place between the hours of 07:30 and 19:00 (Monday to Saturday inclusive). There will be no scheduled construction activity outside of these hours or on Sundays/Bank Holidays.

Emergency works may be required to be carried out outside of these hours in the event of a risk to health, safety or the environment.

In the unlikely event that planned works are required outside of the defined hours set out above, these will only be carried out in agreement with Local Authority.

### 3.1.2 Sequencing of Construction Activity

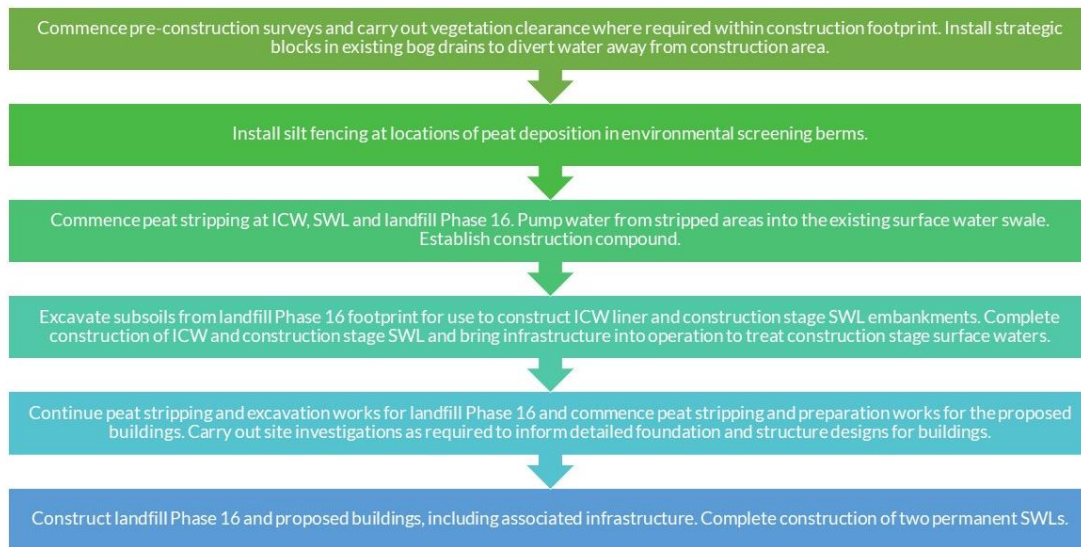
Allowing for receipt of a successful Grant of Planning in early 2024, site surveys and vegetation clearance will commence as soon as possible to ensure that clearance is completed outside of the birds nesting season which runs from 1<sup>st</sup> March to 31<sup>st</sup> August in accordance with Section 40 of the *Wildlife Act*. In the event that clearance of vegetation is required within the bird nesting season, vegetation will first be surveyed by the appointed ECoW to identify the presence of active nests. Only vegetation confirmed to be nest free may be cleared. In the event that a nest is confirmed as present, the nest will either removed under license obtained from the National Parks and Wildlife Service (NPWS) or the nest will be cordoned off until the end of the bird breeding season.

Alongside vegetation clearance works, bog drains within the Proposed Development footprint will be blocked to prevent water draining into the active works areas and to divert surface water away from the construction footprint towards the diversion drains being installed outside the development boundary as part of the Timahoe South Bog rehabilitation works.

Following vegetation clearance and the installation of drain blocks, works will commence to remove peat from the works area. Peat stripping works, particularly in areas of deepest peat, will be planned for completion outside of winter months, where possible, when groundwater levels are naturally lower and the working surface is drier. Peat stripping will commence in the south-western corner to allow construction of the ICW area and construction stage SWL (SWL 7). Some peat stripping will also commence in the footprint of Phase 16 so that subsoils can be removed for the construction of the SWL embankments and the compacted liner for the ICW. The surface water infrastructure will be developed first so that it can be brought into operation and construction stage surface water management can be routed through this infrastructure. To facilitate the construction of the ICW and construction stage SWL, any surface water run-off within the works area will be pumped into the surface water swale which runs around the perimeter of the existing landfill. This will ensure that construction stage waters are treated through the existing SWLs (SWL1 to SWL4) and the existing ICW prior to the proposed surface water management infrastructure being built. This is described further in Section 3.2.

Figure 3-3 sets out the sequence of activities that will be carried out for the initial construction works (Construction Stage 1) at the site to ensure that surface run-off from the bog is suitably managed and does not result in elevated suspended solids in the surrounding drainage network. Managed construction waters from the active works areas will be diverted to ensure it is passing through the SWLs and ICW areas prior to discharge from the site. This will be achieved, following the sequence of activities below, using a combination of existing infrastructure and new infrastructure. Once the surface water management infrastructure proposed as part of this new development is established, all managed construction waters, and in due course

operational phase run-off, will be subject to attenuation and treatment in the ICW prior to release to receiving waterbodies.



*Figure 3-3 – Sequence of activities on commencement of construction works*

## 3.2 OVERVIEW OF CONSTRUCTION METHODOLOGY

This section presents an overview of the construction methodology for key elements of the proposed site infrastructure. This methodology is described in more detail in Chapter 2 of the EIAR.

### 3.2.1 Site Clearance, Drain Blocking and Peat Stripping

Site clearance and peat stripping will involve the use of excavators specifically designed with wide tracks to operate in peat/soft bog/soil environments. Machine combinations (*i.e.* handheld or mechanical) will be chosen which are most suitable for ground conditions in order to minimise the disturbance of peat/soils. The Applicant, Bord na Móna, has considerable experience in the operation of plant and machinery in peat environments and will ensure that these initial development works are only carried out by experienced operators with suitable machinery. Vehicles will use road infrastructure and designated drain culverts/crossing points in all works areas. Tracking of vehicles across/through/along watercourses will not occur. Checks and maintenance of roads and culverts will be ongoing throughout the activity periods.

Peat material will be gradually excavated, in accordance with the construction sequencing set out in Section 3.1, and loaded into suitable off-road dumpers, such as moxy dumpers or similar. Access for the dumpers will be provided on stable ground using existing site materials or imported aggregate to create a safe working platform. The dumpers will remove peat from the works areas and deposit it at the locations of the environmental screening berms surrounding the landfill as shown on Drawing No. 11290-2010 of Appendix 2-1 of the EIAR. Vegetation will be cleared from the position of the screening berms prior to deposition of peat and silt fences put in place at the toe of the proposed embankments.

Peat removal will be carried out until suitable bearing material is encountered. The foundation design for the proposed buildings will be carried out at detailed design stage and site investigations will be carried out to determine the most suitable foundation type. The SWLs and

ICW areas will be constructed on top of suitable bearing strata using subsoils excavated from the landfill footprint.

### ***3.2.2 Site Drainage and Surface Water Management***

As part of the construction of the Proposed Development, the existing bog drains which cross the infrastructure footprint will be removed. This will occur on a phased basis as part of site clearance, peat stripping and general excavations. As the large area occupied by the proposed landfill footprint will be constructed on a phased basis over the 25-year lifetime of the landfill, it is not necessary to remove the entire length of the drains at the outset. Working from the north-west end of the drains, they will be gradually blocked off using locally sourced peat and subsoils. The drain blocks will prevent water ingress into the construction areas and cause water levels in the subsoils and peat along the drain trajectories to rise. The rising water level in the drains and surrounding lands within the Proposed Development boundary will be controlled by use of a partial drain block at the opposite end which will allow water to overflow from the blocked drain to the new drains being constructed outside the Proposed Development boundary as part of the bog rehabilitation works. Drawing No. 11290-2005 of Appendix 2-1 of the EIAR shows the position of the full drain blocks and partial drain blocks on completion of construction of all phases of the landfill and Drawing No. 11290-2058 of Appendix 2-1 of the EIAR shows the detail of the proposed partial block including the overflow pipe which will be installed.

As the landfill construction works progress from Phase 16 to Phase 17, Phase 18 and onwards, the bog drains will be gradually moved closer to the development boundary until the entire landfill footprint has been developed (as shown on Drawing No. 11290-2005 of Appendix 2-1 of the EIAR). This will allow the drains to attenuate run-off from the bogs until such time as they need to be removed to facilitate construction of the engineered landfill liner.

Further discussion on protection of the water environment during construction is set out in Section 4.2.

### ***3.2.3 Landfill Construction***

Construction of the landfill infrastructure will be in accordance with the measures set out in the EPA *Landfill Design Manual* (2000) and follow the same methodology as has been applied for the development of the existing infrastructure at the Drehid WMF. The basal liner of the landfill is the most critical aspect of the infrastructure and the design of this liner, including the specific build-up of the layers comprising the liner, are set out in Section 2.3.2.1 of the EIAR.

Once peat stripping and earthworks have been completed to the landfill formation level, the undercell drainage system will be installed allowing groundwater beneath the landfill to be diverted outside the footprint and discharged into the perimeter swale. This will ensure a dry working environment for the placement of subsequent layers of the basal liner system. A separation geotextile will be laid over the undercell drainage layer on top of which the low permeability bentonite enhanced soil (BES) layer will be placed. BES comprises a sand 'host' material which is mixed with bentonite clay and water at a controlled rate so as to achieve the minimum design permeability. Batching of the BES will take place on site in the construction compound using a mobile batching plant. A trial pad will be constructed, and tests carried out to confirm conformance with the design specification. A Method Statement detailing the placement of BES in the landfill is provided in Appendix 2-9 of the EIAR.

Once BES placement is complete, the HDPE geomembrane is rolled out over the surface and jointed using specialised welding equipment and carried out by trained welding technicians. A second geotextile layer is placed over the geomembrane and finally a layer of drainage stone is

laid to allow leachate generated in the landfill to be collected and transferred out of the landfill to the leachate storage tanks. Quality assurance testing is carried out at all stages of the liner construction to ensure the integrity of the engineered layer. Results of testing carried out on the liner components are collated and retained on site for inspection.

As construction of the landfill liner progresses, works will also be carried out outside the liner footprint to transfer leachate and landfill gas away from the landfill for storage and treatment. Electrical and telecommunications equipment will be installed adjacent to the landfill and roads and surface water management infrastructure will be extended alongside the landfill embankments on a phased basis as required. Blanked end caps will be installed, and tested, on mechanical pipework to allow for future connections and surplus ducting will be installed as necessary for future services.

### 3.2.4 Integrated Constructed Wetland

An Integrated Constructed Wetland (ICW) is proposed as a final treatment step for surface runoff from the Proposed Development. The ICW has been designed by Vesi Environmental, who are specialists in the field. A separate Planning Report in respect of the ICW design and installation is provided in Appendix 2-4 of the EIAR.

The main stages of the ICW construction works as set out in this report are presented in Figure 3-4.

| Table 5: Main stages of ICW construction works |  |
|--|--|
| Stage 1  | Setting out cell layouts   |
| Stage 2  | Excavation of peat to subsoil silt/clay. Import of suitable clay subsoils (from within the facility) to build up cell base and embankments to design level. Layering, tracking and compaction of soils for cell liner - minimum depth of soil liner. Seal must be proven at base of ICW treatment cells.   |
| Stage 3  | <p>Creation of embankments:</p> <ul style="list-style-type: none"> <li>• sloping embankments <ul style="list-style-type: none"> <li>○ Cell 1-5: 1:2</li> </ul> </li> <li>• height of embankment <math>\geq 1.0</math> m</li> <li>• width of embankment tops min. 3.5m wide (stability and access around the wetland)</li> </ul> <p>Placement in layers and compaction during construction.</p> |
| Stage 4  | Distribution of peat soils over the base of each cell as growing medium  |
| Stage 5  | Interconnecting pipework, treatment cells  |
| Stage 6  | Placement of riprap beneath interconnecting pipework (inlet and outlet) in each cell (inhibit encroachment of wetland vegetation)  |
| Stage 7  | Planting each cell with emergent vegetation – Each cell planted with 1-2 plants/m <sup>2</sup> .   |
| Stage 8  | Landscaping of ICW cells and embankment area   |

Figure 3-4 – Main stages of ICW construction works (Extract from Planning Report prepared by Vesi Environmental)

### 3.3 EXCAVATED MATERIAL BALANCE

The excavated materials that are estimated to be generated during the construction phase are presented in Table 3-1 along with the estimated fill volumes.

*Table 3-1 – Cut and fill material estimates*

| Material | Excavation Estimate (m <sup>3</sup> ) | Fill Estimate (m <sup>3</sup> )   |
|----------|---------------------------------------|---|
| Peat     | 506,058                               | 506,058<br>(for use in environmental screening berm)                            |
| Subsoils | 747,855                               | 281,985<br>(for use in embankment and liner fill in landfill, SWLs and ICW)     |
|          |                                       | 465,870<br>(for use in capping works, daily/intermediate cover and landscaping) |

Excavated peat from the Proposed Development area will be reused for construction of environmental screening berms and landscaping at the facility at locations as shown in Drawing No. 11290-2010 of Appendix 2-1 of the EIAR. No peat will be removed off-site, and all peat materials excavated will be utilised within the Proposed Development site area.

Similarly, subsoils excavated for the landfill footprint will be reused in the construction of the engineered landfill embankments, SWL embankments, the ICW liner and capping topsoil in accordance with the required moisture and compaction requirements which will be specified in the CQA Plan. Subsoil excavated for other infrastructure will also be reused for engineering purposes to minimise the quantity of virgin materials to be imported to site. No subsoils will be removed off-site. A Peat Management Plan has been prepared and is included in Appendix 4.2.

Host material for the BES layer and quarried aggregate materials for use as drainage stone in the basal liner will be imported to the site.

### 3.4 CONSTRUCTION COMPOUND

The Proposed Development includes a dedicated Contractor's Compound at the location as shown on Drawing No. 11290-2010 of Appendix 2-1 of the EIAR. The appointed contractor will use this area to establish welfare facilities for their staff for the duration of construction works. This will include site offices, toilets, canteen, storage and waste management infrastructure. This area will be exclusively for use by construction staff. Separate welfare facilities are already in place for operational staff in the existing administration building and additional welfare facilities are being constructed for operational staff in the new MSW Processing and Composting Facility as well as in the new Maintenance Building.

It is anticipated that welfare facilities will be established in the form of portacabins delivered to site prior to commencement of construction. As there is a phased development of the landfill infrastructure over a period of 25 years, the dedicated contractor's compound will provide a long term serviced location for contractors to establish their requirements as and when construction works are being carried out. Connections to site electrical supply, telecommunications supply, water supply and wastewater network will be provided for contractors.

The compound will also provide for parking areas for construction staff as well as a large storage area for temporary set-down of incoming construction materials. Construction parking areas will be equipped with electric vehicle (EV) charging points to encourage workers use of EVs when travelling to site. For construction of the engineered landfill liner, it is required to carry out batching of BES onsite using specialist batching plant. This will be carried out in the compound area and hauled into the required phases of the landfill during construction as required. Similarly, incoming geomembrane rolls and geotextiles will be stored in the compound prior to deployment into the landfill basal liner. The compound will provide a secure and segregated storage area to reduce risk of damage to materials and to provide as much separation as possible from operational HGV movements within the site.

Surfacing in the compound, parking and storage areas will comprise compacted hardcore materials. An impermeable refuelling area will be created for refuelling and maintenance of plant and machinery. Fuel and oil storage will be in a bunded container to prevent any accidental release to the ground. Spill trays will be used in all refuelling situations and spill kits will be kept in all site vehicles for use in the event of a spill. See Section 4.2 for further details.

### 3.5 CONSTRUCTION QUALITY ASSURANCE

In order to provide assurance that the Proposed Development is constructed in accordance with intended design and technical specifications, a comprehensive Construction Quality Assurance (CQA) Plan will be implemented during the construction phase. The CQA Plan will include Construction Quality Control (CQC) procedures to ensure that materials and workmanship meet defined specifications.

CQC procedures will include the integrity testing of all landfill lining systems, surface water, foul water, process water pipework and structures in accordance with industry accepted standards and procedures which will be set out in the CQA Plan. All integrity testing will be inspected and witnessed by a suitably qualified and experienced Bord na Móna Engineer, or appointed Consultant Engineer acting on their behalf. Integrity test certificates will be signed by both the Contractor's Engineer and the Engineer representing Bord na Móna.

Following the completion of construction and testing of each element of the Proposed Development and prior to the acceptance of waste in the MSW Processing and Composting Facility or the new Landfill, a CQA Validation Report will be prepared by a third party. The CQA Validation Report will be required to be submitted to the EPA to obtain approval for licensed facility activities, including placement of waste in the landfill.

### 4.0 ENVIRONMENTAL MANAGEMENT

This section sets out the key measures to ensure appropriate environmental management of specific aspects of the proposed works. It is prepared in accordance with the development design and construction methodologies as set out in the EIAR and incorporates the construction stage mitigation measures as set out in the EIAR and NIS. Appendix 4.1 includes a schedule of construction stage mitigation measures which is extracted from Chapter 16 (Schedule of Mitigation) of the EIAR.

The particular requirements outlined within the following sections present the key implementation constraints, site specific obligations and best practice requirements with which the appointed Contractor shall comply. (Note where reference is made to the Contractor, this applies to all contractors which may be appointed for construction of any phase of the development).



Construction of the Proposed Development will be carried out in line with best practice guidance in all areas of potential environmental impact and specific guidance documents are identified within the following sections. Across the full project duration, the contractor will utilise the general guidelines set out in the CIRIA C741 publication *Environmental Good Practice on Site (4<sup>th</sup> Edition)*.

## 4.1 ENVIRONMENTAL TRAINING AND AWARENESS

In order to ensure that environmental awareness and compliance is communicated effectively at the start and throughout the construction works, the CEMP and its contents will be communicated to all site personnel, including management staff, operatives and sub-Contractors. The key elements of the CEMP will form part of the site induction which will be mandatory for all employees, contractors and visitors attending the site.

The site induction will be provided to all construction staff before they commence work on site and, where appropriate, the Contractor(s) will identify specific training needs for the construction workforce and will ensure that appropriate training requirements are fulfilled.

A baseline level of environmental awareness will be established through the induction process. Key environmental considerations and objectives will be incorporated into this induction. Without such training, those involved in constructing the proposed project would not be aware of relevant environmental control measures and, consequently, the environmental aims and objectives would be at risk of not being met. Specifically, site inductions will cover the following as a minimum:

- Introduction to the Environmental Manager;
- Description of the CEMP and consequences of non-compliance;
- The requirements of due diligence and duty of care;
- Overview of conditions of consents, permits and licences, including environmental control measures and commitments;
- Identification of environmental constraints and notable features within the site; and
- Procedures associated with spill management, incident notification and reporting, including procedures for dealing with damage to the environment.

Environmental toolbox talks will be provided to all site personnel and sub-consultants on a regular basis. These will be targeted at particularly sensitive environmental issues such as:

- Compliance with facility IE Licence Conditions and relevant conditions of IPC Licence for Timahoe South Bog;
- Water pollution and silt control;
- Pumping of water from works areas;
- Water pollution in relation to cement and concrete handling;
- Spill prevention and control;
- Dust management;
- Protection of sensitive ecological habitats and key ecological receptors;
- Protection of sensitive archaeological features, where identified; and
- Waste segregation and resource management.

## 4.2 MANAGEMENT OF WATER ENVIRONMENT

The Contractor shall have regard to the following best practice documents with regard to the management of the water environment during construction activities:

- CIRIA C532: *Control of water pollution from construction sites: guidance for consultants and contractors*;

- CIRIA C648: *Control of water pollution from linear construction projects*;
- CIRIA SP156: *Control of water pollution from construction sites – guide to good practice*;
- Coillte (2009): *Forest Operations and Water Protection Guidelines*;
- Coillte (2009): *Methodology for Clear Felling Harvesting Operations (Draft)* Forest Service;
- Forestry Commission (2004): *Forests and Water Guidelines*, Fourth Edition. Publ. Forestry Commission, Edinburgh;
- Forest Service (2000): *Forestry and Water Quality Guidelines*. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford; and
- Inland Fisheries Ireland, *Guidelines on protection of fisheries during construction works in and adjacent to waters* (2016).

#### 4.2.1 Site Drainage

The proposed site drainage design is set out in Chapter 2 of the EIAR and is shown on Drawing No. 11290-2014 of Appendix 2-1 of the EIAR. This design mirrors the concepts that are already in place at the Drehid WMF and comprises a network of swales, drains and pipework to collect surface run-off and managed groundwater. This run-off is diverted to two new SWLs (SWL 5 & 6) where attenuation is provided to limit discharge to the applicable Greenfield run-off rates (set out in the Engineering Services Report in Appendix 2-3 of the EIAR) prior to treatment in a new ICW. Discharge from the ICW will be into an existing bog drain flowing through an existing settlement pond prior to outfall into the Cushaling River. Section 3.2.2 sets out the methodology for managing surface run-off and groundwater during the construction phase of the development, and particularly during the initial construction stage (Construction Stage 1).

The site drainage network will also be utilised during construction activity to ensure there is no direct discharge of water from the construction phase activities to the receiving waterbody. The permanent surface water management infrastructure will be constructed at the outset so as to be available to manage water from subsequent construction activity as described in Section 3.1. A dedicated construction stage SWL (SWL 7) will be used to manage surface run-off from construction activity separate from the operational activities. The SWLs will also provide containment capacity in the event of a spill or leak at the facility and the outflow can be closed off to contain any potential pollutants within the lagoons. In the event of contaminated run-off being contained in the SWLs, the incident will be reported as set out in Section 5.0, samples taken of the contaminated liquid for classification, as required, and the liquid pumped out of the lagoon using a suitable vacuum truck and disposed of at a licensed waste facility off-site.

The surface water management system will be visually inspected on a daily basis during construction works by the SHEQ Officer to ensure that it is working optimally. The frequency of inspection will be increased when peat stripping, and earthworks are being carried out. Where issues arise, construction works will be stopped immediately, and the source of the issue will be investigated. During the construction phases, monitoring campaigns will be undertaken as presented in Section 6.0. Records of all maintenance and monitoring activities associated with the surface water network will be retained by the Contractor on-site, including results of any discharge testing.

The Contractor will implement control measures such as temporary drains and pumping of water to maintain a dry working environment, particularly for the landfill construction. Following water management procedures in the existing WMF, a perimeter drain will be dug around the landfill phase that is under construction as a means of helping to control water levels in the excavations. This limits the quantity of water collecting in excavation floors. Existing drains that presently cross the landfill footprint will also be blocked off. This will raise water



levels in subsoils and peat along the drain trajectories, external to the landfill footprint, but will also prevent ingress of water from the drains into the excavations.

The water pumped by sump pumps will pass through silt bags before being discharged into the SWL or swale around the existing landfill footprint. As the water pass through the silt bags, the majority of sediment and organic matter is retained by geotextile fabric. The silt bags will be used with natural vegetation filters or sedimats, Sediment entrapment mats, consisting of coir or jute matting, will be placed at the silt bag locations to provide further treatment of the outfalls from silt bags. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure that all water passes through this additional treatment measure. Level spreaders will be designed for each outfall.

Erosion and sediment control measures which will be implanted will include, but will not be limited to:

- Minimisation of peat and soil exposure, by controlling, in so far as is practical, the locations where vegetation/peat/soil is stripped and when vegetation/peat/soil is stripped;
- During peat stripping and placement in environmental screening berms, silt fences, straw bales and/or biodegradable geogrids will be used to control surface water run-off from material storage areas;
- Silt fences/traps will be placed downgradient of work areas near and along drains to allow the settling of silt and limiting sediment transport into and via drains. Any accumulated sediments will be excavated based on visual inspection;
- Drains and silt fences/traps will be maintained throughout the activity periods, and will be kept clear of sediment build-up;
- Brush materials, including roots, will be stacked in dedicated dry areas. Straw bales will be emplaced on the downgradient side of such areas. Branches, logs or debris will not be allowed to build up in aquatic zones; and
- All surface water run-off from the development (including during construction works) will pass through SWLs and an ICW area.

To maximise the erosion and sediment control benefits of natural vegetation and to prevent unnecessary vegetation loss, stripping of existing cover will be kept to a minimum and only the areas required for infrastructure and to facilitate construction of infrastructure will be disturbed.

#### ***4.2.2 Avoidance Measures***

The works programme will take account of weather forecasts and predicted rainfall in particular. Risks and effects of earthworks are made greater during storm events. Hence, earthworks will not be carried out during significant storm events. Decisions to potentially suspend works will be made from visual observation and weather forecasting of storm events. Large excavations and movements of peat, subsoil or vegetation stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.

The following forecasting systems are available and will be used on a daily basis at the site to direct proposed construction activities:

- General Forecasts: Available on a national, regional and county level from the Met Eireann website ([www.met.ie/forecasts](http://www.met.ie/forecasts)). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates;

- MeteoAlarm: Alerts to the possible occurrence of severe weather for the next two days. Less useful than general forecasts as only available on a provincial scale;
- 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events;
- Rainfall Radar Images: Images covering the entire country are freely available from the Met Éireann website ([www.met.ie/latest/rainfall\\_radar.asp](http://www.met.ie/latest/rainfall_radar.asp)). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and
- Consultancy Service: Met Éireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest. Using the safe threshold rainfall values will allow work to be safely controlled (from a water quality perspective) in the event of forecasting of an impending high rainfall intensity event.

Works will be suspended if forecasting suggests any of the following is likely to occur:

- >10 mm/hr (i.e. high intensity local rainfall events);
- >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or
- >half monthly average rainfall in any 7 days.

Prior to works being suspended the following control measures will be completed:

- Secure all open excavations;
- Provide temporary or emergency drainage to prevent back-up of surface run-off in work areas;
- Avoid working during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded. Decisions are subject to visual inspection and judgement by the resident (supervising) engineer. The intent and objective is to control erosion, avoid collapses of embankments, and limit the mobilisation and transport of sediments; and
- Provide cover to material storage areas i.e., adequate tarpaulin over stockpile areas if material cannot be reinstated prior to suspension.

Run-off will be maintained at greenfield (pre-development) run-off rates. The existing and proposed SWLs include valves at the outlet to control the quantity of water released such that the run-off will not exceed pre-development rates. This will also apply during construction activity. Discharge from the SWL and through the ICW will be by gravity.

Swales will surround the works and staging areas. Runoff and drainage water collected in the swales will initially be directed to the existing perimeter swale that surrounds the WMF. From here, the collected water will be routed to the existing attenuation ponds and ICW system south of the WMF. Directing the water to in this manner will require pumping from collector sumps which will be placed at suitable locations in active works and staging areas. The water pumped from the sumps will be led to the perimeter swale using temporary pipes.

In addition to the source and in-line control measures, the water will be treated through the existing attenuation lagoons and ICW system. Once the proposed, new attenuation lagoons and ICW system are constructed, the water will pass through this system, reducing the distance of the sump pumping involved.

Trapped sediments in source, in-line and treatment controls, including swales and drains will be periodically removed based on regular inspection. Drains will also be maintained so as not to

overflow during the construction stages. Outflows from blocked drains will be controlled by 8-inch pipes at the downstream ends of each blocked drain.

### **Pumping/Dewatering of Open Excavations/Pits**

Following water management procedures in the existing WMF, a perimeter drain will be dug around the phase that is under construction as a means of helping to control water levels in the excavations. This limits the quantity of water collecting in excavation floors.

Existing drains that presently cross the landfill footprint will also be blocked off. This will raise water levels in subsoils and peat along the drain trajectories, external to the landfill footprint, but will also prevent ingress of water from the drains into the excavations.

### **4.2.3 Modification to Drainage Network in TSB**

The proposed drain blocks outside the landfill expansion footprint will contribute to raising water levels in and surrounding the blocked drains. The raising of water levels is expected to reduce the leaching potential of ammonia and mobilisation of suspended matter east of the landfill expansion footprint.

The flat areas between the peat berms and actively flowing drains (e.g., the new south-to-north drain) will be purposefully vegetated to create buffer zones, whereby the aim is to attenuate ammonia and suspended matter loads.

The drain blocks will also serve as check dams for suspended solids (including organic matter). The water in the blocked drains will undergo natural attenuation processes (including nitrification), and such processes will continue in the downstream direction within TSB, Mulgeeth Stream and along the Blackwater (Longwood) River.

Bog drainage water which passes to the Cushaling River will continue to flow through the old settlement ponds near the western BnM landholding boundary. Bog drainage water which passes to the Mulgeeth Stream will pass through a new settling pond to be built on the main drain within Timahoe South Bog (TSB), before the exit point of TSB, as per PCAS/TSB Decommissioning and Rehabilitation Plan.

### **4.2.4 Concrete Handling**

Precast concrete materials will be used, for the most part, in landfill construction which will reduce risks associated with placement of fresh concrete. Similarly, headwalls, pump stations, chambers, manholes and similar infrastructure will be installed using precast units. In-situ concrete will be required for floors within the new buildings and hard surfaced aprons around the buildings to provide impervious surfaces. Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in sealed concrete delivery trucks. The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching. When concrete is delivered to site, only the chute of the delivery truck will be cleaned, using the smallest volume of water necessary, before leaving the site. Concrete trucks will be washed out fully at the batching plant, where suitable facilities are already in place.

The small volume of water that will be generated from washing of the concrete trucks chute will be directed into a temporary lined impermeable containment area, or a concrete wash unit. This type of unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids can be disposed of off-site as waste

material. Where temporary lined impermeable containment areas are used, such containment areas will be excavated and lined with an impermeable membrane.

In summary, measures to prevent surface water contamination from concrete pouring on-site will include:

- Using weather forecasting to assist in planning large concrete pours and avoiding large pours where prolonged periods of heavy rain is forecast;
- Concrete will be delivered where it is needed in sealed concrete delivery trucks;
- Ready-mixed supply of wet concrete products will be minimised;
- Pre-cast elements for culverts will be used;
- Restricting concrete pumps and machine buckets from slewing over drains/watercourses while placing concrete;
- Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets;
- Ensuring that covers/mesh are available for freshly placed concrete to avoid the surface washing away in heavy rain;
- Disposing of any potential, small surplus of concrete after completion of a pour in suitable locations away from any watercourse or sensitive habitats;
- Discussing arrangements for concrete deliveries with the suppliers before works commence to ensure they are aware of on-site wash-out restrictions.
- Batching of cement will be carried out at dedicated, existing locations within the WMF.
- Concrete trucks will be directed back to their batching locations for washout;
- Chute cleaning water will be undertaken at lined cement washout ponds;
- Discharge of cement-based products to construction phase drainage systems or directly to any artificial drain or other watercourse will not be allowed;
- Containment will be facilitated with straw bales;
- Ponds will be lined with an impermeable membrane. Ponds will also be covered when not in use to prevent rainwater collecting;
- Pour sites of cement will be kept free of standing water, and plastic covers will be ready in case of sudden rainfall events;
- Concrete will not be transported around the site in open trailers or dumpers so as to avoid spillage while in transport;
- All concrete used in the construction will be pumped directly into the shuttered formwork from the delivery truck. If this is not practical, the concrete will be pumped from the delivery truck into a hydraulic concrete pump or into the bucket of an excavator, which will transfer the concrete locally to the location where it is needed;
- Arrangements for concrete deliveries will be discussed with operators before work starts, confirming routes, prohibiting onsite washout and discussing emergency procedures; and
- Clearly visible signage will be placed in prominent locations close to concrete pour areas specifically stating washout of concrete lorries is not permitted on the site.

#### ***4.2.5 Refuelling - Fuel and Oil Management***

Construction vehicles will be refuelled off-site, wherever possible. This will primarily be the case for road vehicles such as vans and trucks. However, for construction machinery that will be based on-site continuously, a limited amount of fuel will have to be stored on site.

On-site refuelling of machinery will mainly be carried out using a mobile double skinned fuel bowser typical of that shown in Figure 4-1. Refuelling will be carried out at least 50 m from bog drains.



*Figure 4-1 – Typical mobile fuel bowser (Source: Clark Machinery Group)*

The fuel bowser, typically a double-axle custom-built refuelling trailer, will be re-filled off-site, where possible, or at the construction compound, and will be towed as required within the site by a 4x4 vehicle or tractor to where machinery is located. It is not practical or preferable for most heavy construction vehicles (such as excavators, dozers, dumpers etc.) to travel back to the refuelling point in the construction compound given the size of the site. The 4x4 vehicle/tractor will also carry fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level impermeable area in the construction compound when not in use.

Oils, lubricants and other hazardous liquids required for maintenance of equipment during the construction phase will be stored on the dedicated impermeable storage platform in the construction compound. Any additional fuel containers, other than the fuel bowser, used for smaller equipment (such as generators, lights etc.) will be stored within additional secondary containment e.g. bund for static tanks or drip trays for smaller mobile containers. Taps/nozzles for fuels and storage containers for oils will be fitted with locks to ensure their use is controlled. Only designated trained and competent operatives will be authorised to refuel plant on site.

New clean ancillary machinery equipment such as hoses, pipes and fittings required on-site will be contained within a bunded area, however any used or damaged parts will not be stored on-site and will be removed immediately. Any repair works required on machinery involving fuel and oil control will be carried out off-site where practical, or in the construction compound over an impermeable surface. Unless unavoidable, repair works carried out in the field where machinery is operational will use spill trays and absorbent materials to prevent release of contaminants to the ground. Maintenance and repair works will be carried out at least 50 m from bog drains. Machinery will not be brought back into use until repair works have been completed.

Daily checks prior to start-up of plant and machinery will minimise the risk of break-down and associated contamination risks for on-site repairs. Records of daily pre-start checks will be maintained and kept in the site office. A clean site policy and diligent housekeeping will also reduce the potential of hydrocarbon release on-site.



In summary, mitigation measures to be implemented will include:

- Onsite refuelling will be carried out at dedicated locations by trained personnel only;
- Onsite refuelling of machinery will be done by mobile double-skinned fuel bowzers;
- Drip trays and fuel absorbent mats will be available and used during all refuelling operations;
- A permit for the fuel system will be put in place;
- Fuel storage tanks will be bunded, self-contained and double-walled, conforming with EPA bunding specifications;
- The fuel-filling area will be fitted with a storm drainage system and an appropriate oil interceptor;
- The plant used during construction will be regularly inspected for leaks and fitness for purpose;
- Spill kits will be available to deal with and accidental spillages in and outside the re-fuelling area.

#### **4.2.6 Wastewater Management**

Wastewater will not be treated or disposed of within the Proposed Development areas. Associated wastewater will be collected regularly and brought offsite in fully enclosed tanks for disposal by authorised means (permitted wastewater collector) to a wastewater treatment plant. The use of sealed storage tanks and offsite disposal breaks the link between the source and receptor.

### **4.3 PEAT MANAGEMENT**

Construction of the proposed infrastructure, and in particular the new landfill, will require significant earthworks to remove residual peat cover and excavate to the required formation levels.

Both stripped/excavated peat and subsoil from the footprint of new infrastructure will be reused to support environmental screening berms and landscaping, including at the perimeter of the Proposed Development to form a screening berm around the extended facility. The stripping of peat and creation of the berms will be carried out on a phased basis as the landfill footprint is gradually extended over a period of c. 25 years.

Similarly, the underlying subsoils will be excavated within the landfill footprint to achieve the required formation levels. Excavated materials will be transported a short distance within the site to create the external, interphase and intercell embankments within the landfill, form the embankments for the SWLs and create the engineered liner for the ICW. Any excess subsoils may also be used for capping purposes, pending testing for suitability. As mentioned, no peat will be removed off-site. All stripped peat will be utilised within the Proposed Development area. A separate Peat Management Plan has been prepared and is included as Appendix 4.2.

### **4.4 ROADS AND TRAFFIC MANAGEMENT**

Section 2.4.2 sets out the access to the site from the public road network. An existing entrance is in place from the R403 which is used for ongoing construction and operations at the existing facility. Construction traffic associated with the Proposed Development will also use this entrance, there are no other access points into the site. Chapter 14 (Traffic and Transport) of the EIAR provides details of the proposed haulage routes which will be used in delivery of materials and removal of waste from the site during construction. These routes, which primarily consist of existing approved haulage routes for the Drehid WMF, are shown in Figure 14-5 of

the EIAR. HGVs driving to and from the site during construction activity will only be permitted to use the approved haulage routes.

As part of the procurement process for construction works at the facility, an approved haul route map will be provided to Tenderers to ensure that the required control of HGV movements is accounted for in Tender submissions. Contractors will be required to demonstrate to the Bord na Móna Project Manager that this haulage route map has been shared with their suppliers prior to commencement of delivery of materials to the site or removal of waste. In addition, Bord na Móna staff will carry out spot checks on construction related HGVs to ensure they are adhering to the requirements. This audit and spot check process is already in place at the existing facility and Bord na Móna impose a penalty system to enforce compliance.

The following measures will be implemented to monitor and repair haul roads used during construction activity:

- An updated photographic survey of haul roads to be undertaken immediately prior to commencement of construction; and
- Continuous monitoring of haul roads throughout the construction phase.

A number of surveys have already been carried out, in line with TII Guidelines, prior to submission of the planning application for the Proposed Development and are described in Section 14.11 of the EIAR. These detailed pavement condition surveys will underpin the determination of maintenance costs of the life of the scheme and will facilitate and assessment of pavement defects that may arise during the construction period.

Once construction traffic enters the Bord na Móna landholding from the R403, vehicles will use the existing private road to access the location of the proposed works. Construction traffic (HGVs, LGVs and cars) share this road with the operational traffic (HGVs, LGVs and cars). A 50 km/hr speed limit is in place on this road and is monitored by Bord na Móna staff at the weighbridge. A speed limit of 20 km/hr will be put in place around the temporary construction site roads. Penalties will be imposed for any persons exceeding these speed limits.

Section 2.4.2 describes the site arrangements for construction traffic to gain access to the construction compound and the works areas. Incoming construction traffic will use the new middle lane of the access road and turn right into the construction compound prior to the weighbridge. Construction traffic is not required to or permitted to cross the weighbridge and signage will be erected directing construction vehicles to the correct area. Operational traffic movements within the facility are under constant review as access onto and off the existing landfill changes over time. Operational staff at the Drehid WMF will review traffic flows at the time of construction commencement and liaise with the Contractor to ensure the safe and efficient movement of vehicles within the site. The main principal in the management of traffic movements within the site will be to keep operational and construction traffic separate insofar as is possible.

The following measures will be implemented to reduce the volume of traffic associated with construction activity:

- All excavated materials will be retained within the site and Contractors will prepare comprehensive plans for the excavation, movement and placement of materials so as to reduce trips and distances travelled;
- Spoil and peat management planning will include for maximising each movement and where possible avoiding unladen machinery movements;
- Contractors will plan deliveries to the site to maximise the payload per delivery so as to minimise the number of trips;

- Local suppliers will be used for construction materials, where possible; however, it is noted that the proposed landfill infrastructure requires the delivery of a number of specialised materials (such as bentonite clay, BES host material, high specification drainage stone and geomembrane) which cannot be sourced locally;
- Detailed design and delivery planning will give consideration to reducing material consumption and the generation of waste. This in turn will reduce the quantity of waste requiring removal off-site. Suitable wastes generated from construction activity can be disposed of at the existing landfill which will minimise traffic movements associated with outgoing construction waste; and
- Construction staff will be encouraged to carpool so as to reduce car and van movements.

In addition, electric vehicle (EV) charging points will be made available at the contractor's compound to facilitate construction staff using EVs/hybrid vehicles.

## 4.5 NOISE AND VIBRATION CONTROL

The Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures when deemed necessary to comply with the recommendations of British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*.

An assessment of construction phase noise emissions has been carried out in Chapter 10 (Noise and Vibration) of the EIAR. Section 10.2.1 of the EIAR sets out the proposed Construction Noise Threshold (CNT) for the closest noise sensitive locations (NSLs), which are:

- Weekdays 07:00 – 19:00hrs: 65 dB  $L_{Aeq,12hr}$
- Saturdays 07:00 – 13:00hrs: 65 dB  $L_{Aeq,6hr}$
- Saturdays 13:00 – 19:00hrs: 55 dB  $L_{Aeq,6hr}$

There are no significant sources of vibration associated with the construction phase. Excavations into soft ground such as peat and soils will not generate significant levels of vibration at source. In the unlikely event that rock breakers are required, this is potential for localised low levels of vibration in the immediate vicinity of the source, however the magnitude of vibration from this activity is orders of magnitude below those associated with any cosmetic damage to buildings.

No specific mitigation measures are required to control noise or vibration during the construction phase given the significant distance between the site works and the nearest NSLs. Notwithstanding, best practice noise and vibration control measures, will be applied on site as standard during this phase.

Reference is made to BS5228 Parts 1 and 2, which offer detailed guidance on the control of noise and vibration from construction activities. The best practice control measures in this document will ensure that:

- During the construction phase, the works will be managed to comply with the limits set out above using methods outlined in BS 5228-1; and
- The best means practicable, including proper maintenance of plant and equipment, will be employed to minimise the noise produced by on site operations.

The SHEQ Officer, or equivalent, will supervise the works to ensure compliance with the noise limits set out above and described in the EIAR. The following best practice measures will be implemented at the site:

- No plant used on site will be permitted to cause an on-going public nuisance due to noise;



- Regular and proper maintenance of plant and machinery will minimise noise generation at the site;
- Plant with low inherent potential for generation of noise and/ or vibration will be selected, where practicable;
- Noisy/ vibratory plant will be placed as far away from sensitive properties locations as permitted by site constraints;
- All vehicles and mechanical plant will be fitted with exhaust silencers and maintained in good working order for the duration of the contract;
- Compressors will be attenuated models, fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use;
- Any plant, such as generators or pumps, which is required to operate outside of the working hours set out in Section 3.1.1 will be surrounded by an acoustic enclosure or portable screen;
- Road surfaces will be maintained free of dirt and debris as much as possible to reduce noise associated with HGV traffic on the access road;
- The hours of construction activity likely to create high levels of noise and vibration will be limited to avoid unsociable hours, where possible. Construction hours for the project are set out in Section 3.1.1 and reflects the permitted hours of operation under the current Industrial Emissions (IE) Licence (Reg. No. W0201-03). In the unlikely event that critical construction works are required outside of these hours, the project team will liaise with Kildare County Council prior to carrying out the activities. Works may occur outside normal working hours in the event of an incident or emergency which requires immediate attention;
- A complaints notification procedure is in place at the existing facility in accordance with the requirements of the IE Licence, any noise complaints received will be recorded by facility staff, investigated and resolved as soon as practicable;
- Communication channels with the local authority are already in place given the ongoing activities at the facility, these will be maintained throughout future construction works; and
- Noise monitoring required in accordance with the IE Licence will be carried out. No specific construction noise or vibration monitoring is proposed, however Bord na Móna will carry out monitoring if so required where a persistent issue is arising at the site.

## 4.6 AIR QUALITY AND DUST CONTROL

In order to minimise dust emissions during construction works, a series of mitigation measures have been prepared in the form of a dust minimisation plan (DMP) which is included as Appendix 4.3.

The following measures are included in the DMP:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic;
- 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. The site access road has a 50 km/hr speed limit in place. On any un-surfaced site road, the speed limit will be 20 km/hr;
- Vehicles delivering material with dust potential (such as sand and aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust;

- Public roads outside the site will be regularly inspected and cleaned as necessary;
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods; and
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

Further to the above mitigation measures, the Contractor will have due regard to relevant guidance such as '*The Control of Dust and Emissions during Construction and Demolition*' published by the Greater London Authority (GLA) in 2014 and '*Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes*' published by the National Roads Authority (NRA) (now Transport Infrastructure Ireland (TII)) in 2011.

At all times, these procedures will be strictly monitored, and rules enforced. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction activity.

In addition to dust minimisation measures, the maximum utilisation of the on-site material sources will reduce the need to import excavated materials, such as soil, to the site. Incoming C&D waste such as rubble and soil & stones will also be screened and processed for reuse within the site. These measures will reduce the importation of virgin materials and avoid the embodied carbon associated with haulage of the material to the site.

Monitoring of the embodied carbon during the construction phase will be carried out. The aim of the monitoring will be to seek further ways to minimise climate impacts. Monitoring will include embodied carbon of construction materials, water usage, power and fuel usage and waste generation (including reuse and recycling rates). Where monitoring shows that the project is not meeting established targets, mitigation measures will be reviewed, and additional measures put in place.

A planning stage DMP (Appendix 4.3) has been prepared which will be implemented by the Contractor to minimise and control dust emissions. This DMP will be updated by the Contractor, alongside this CEMP, to account for any additional requirements set out in Planning Conditions.

## 4.7 BIODIVERSITY

### 4.7.1 *Appointment of Environmental / Ecological Clerk of Works (ECoW)*

In order to monitor and advise on any potential ecological impacts, a suitably qualified ECoW will be appointed by the Contractor. The ECoW will be experienced in the management of peatland habitats and will oversee all construction works and monitor any possible sources for impacts for the duration of the construction programme. The ECoW will ensure that the construction works will be undertaken in strict agreement with the methods prescribed within this CEMP, the EIAR and the NIS and will have the power to stop the works in case any activities/works are not compliant.

### 4.7.2 *Management of European Sites*

Mitigation measure which will ensure the protection of the River Barrow SAC, River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA during the construction phase

are outlined in Section 7 of the NIS which is contained in Appendix 6-1 of the EIAR and have been incorporated into this CEMP and included in Appendix 4.1 Schedule of Mitigation.

#### 4.7.3 Management of Habitats and Flora

Where required, vegetation clearance will be kept to a minimum. The proposed construction work areas will be demarcated prior to the construction works commencing. No clearance of vegetation will be undertaken outside of the demarcated areas within the Proposed Development site. Construction vehicles will be restricted to designated access tracks to avoid impacting adjacent habitats and to ensure that peat/soil compaction is restricted to these tracks. All disturbed ground will be fully reinstated following the completion of the works.

Bog mats will be used mitigating rutting and reducing soil erosion and impact to bog habitat. Bog mats replacement will be enforced when they become heavily used and worn. In addition, machinery used will have wide tracks suitable to be used over areas of soft bog.

#### 4.7.4 Replanting of New Vegetation

The development of the ICW within the Proposed Development site will provide a new wetland feature which will be beneficial to invertebrate, amphibians and a range of breeding and wintering waterfowl species. The ICW will be approximately 5.61 ha in size and include a range of locally sourced and native wetland emergent species such as greater pond sedge (*Carex riparia*), reed sweet-grass (*Glyceria maxima*), bulrush (*Typha latifolia*), common clubrush (*Schoenoplectus lacustris*) and yellow flag iris (*Iris pseudacorus*). In addition, native trees and shrubs such as alder buckthorn (*Frangula alnus*), willow, alder and birch will also be planted around the ICW where suitable ground conditions can be achieved, covering an area of approximately 2.15 ha.

In addition, the capping layer of the landfill will be planted with grass and shrub species, as each section is completed providing a total of 35.75 ha of new habitat. The use of "Green hay", which will be locally sourced, will be used to support reseedling the landfill capping. This will be done in addition to the use of an initial "nurse crop" that will initially revegetate the new soil. Primarily, native Irish species red fescue (*Festuca rubra*) and Common bent-grass (*Agrostis stolonifera*) will be used. This enhancement measure will aid in the recolonisation of suitable habitat for lepidoptera species.

Furthermore, 4 -6 m high berms enclosing the development from the north, east and west will be planted with bands of locally sourced native peatland tolerant grass and shrub species. The remaining areas of the berm will be left to naturally revegetate over time. The vegetating of these areas will not only provide new habitats (ca, 12.6 ha), but will also compact the peat, reducing runoff of suspended solids.

The land located to the east of the eastern berms will be vegetated with peat tolerant grass and shrub species and will cover an area of 16.46 ha. This area of vegetation will also create a natural vegetative buffer between the berms and the drainage ditch, again reducing runoff.

Finally, the lands located to the south of the proposed landfill site will benefit from the blocking of drains on the eastern boundary of the site and will likely re-wet overtime. Blocking drains will raise water levels locally which will maintain groundwater levels higher and help to re-wet previously drained peat. As such, drain blocking will have a localised positive effect. Re-wetting is expected to reduce the leaching of ammonia and other chemical constituents (e.g. organic matter, dissolved organic carbon).

The regeneration of new habitats within this area (lands located to the south of the landfill and east of the eastern berm) will be encouraged firstly by reducing all disturbance within the area and allowing natural colonization, and through the creation of new habitats such as fens, reed swamps, heath embryonic sphagnum-rich peat forming communities and wet and birch woodland communities, where conditions are suitable.

The total area of new planting will be approximately 72.57 ha. All areas of replanting are shown in the Landscape Plan in Appendix 2-1 of the EIAR. Further details on the replanting and creation of new habitats are provided in the Habitat Management and Enhancement (HME) Plan included in Appendix 6-3 of the EIAR.

#### **4.7.5 Management of Invasive Species and Pathogens**

In order to comply with Regulations 49 and 50 of the *European Communities (Birds and Natural Habitat) Regulations 2011*, the appointed Contractor will ensure biosecurity measures are implemented throughout the construction phase to ensure the introduction and translocation of invasive species is prevented.

The following mitigation measures are prescribed to control the translocation or spread of invasive species and / or pathogens:

- No invasive plant species were recorded within the Proposed Development. However, in the event that proposed construction works are delayed more than 18 months, a pre-construction invasive species survey will be undertaken as recommended within the CIEEM Advice Note (CIEEM, 2019). In the event that an invasive plant species, listed in Part 1 of the Third Schedule of S.I No. 477/2011 – *European Communities (Birds and Natural Habitats) Regulations 2011* is recorded a site-specific Invasive Species Management Plan (ISMP) will be prepared.
- Prior to arrival all machinery and equipment used during the construction works will be thoroughly cleaned and then dried using a high-pressured steam cleaning, with water >65 °C, in addition to the removal of all vegetation material. Disinfectant, such as a Virkon® Aquatic solution, will be used. The appointed Contractor will establish and clearly delineate a bunded cleaning/washing area.
- No removed material or run-off will be allowed to enter any water bodies (e.g. drainage ditches).
- Evidence that all machinery and equipment has been cleaned will be required to be on file for review by the statutory authorities and the appointed ECoW.

#### **4.7.6 Protection of Aquatic Habitats**

All mitigation measures to protect water quality set out in Section 4.2 of this CEMP and within the EIAR will be implemented. The implementation of these control measures will ensure the protection of aquatic species in the Cushaling River and further downstream.

Key measures which will protect aquatic habitats during construction activity are:

- Site drainage management and diversions as set out in Section 3.2.1 and 3.2.2 will ensure that water is diverted away from the works area and that all water pumped out of excavations is routed through SWLs and the ICW prior to discharge into the Cushaling River;
- All drains within the Proposed Development site will be blocked prior to the construction works commencing. The drains will be blocked off using locally sourced subsoil materials which will cause water levels in the subsoils and peat along the drain trajectories to rise. The rising water levels in the drains and surrounding lands within the

Proposed Development boundary will be controlled by installing overflow pipes at the opposite end of drains which will allow water to overflow from the blocked drains to the new drains being established as part of the TSB Decommissioning and Rehabilitation Plan. Drain blocks and overflows will be constructed at the outset of peat stripping works to ensure that drainage water is kept out of excavation areas.

- These blocked drains to the east of the proposed landfill phases will serve as check dams/silt dams, helping to settle out any suspended matter that may derive from the peat berms.
- No instream works or water abstraction will be undertaken within/from the Cushaling River.
- Silt fences will be erected along the southern boundary of the Proposed Development site and around stockpiles of material.
- Prior to the commencement of excavations, an area for stockpiling the excavated material will be identified within the Proposed Development site, at minimum of 50 m from the Cushaling River, or any drainage ditch.
- Excavation works will not be carried out during or following heavy rainfall (i.e. if there is a yellow weather warning in place or 5-mm in a 1-hour period) - refer to Section 4.2.2.
- An emergency plan for the construction phase of the Proposed Development to deal with accidental spillages will be drawn up, which all site personnel must adhere to and receive training - refer to Section 5.0.

#### 4.7.6.1 Surface Water Quality Mitigation Measures

During the construction phase of the Proposed Development surface water quality measures will be installed and maintained in accordance with the following CIRIA guidance; '*Control of water pollution from construction sites*' (C532) (Masters-Williams et al., 2001), and '*Control of Water Pollution from Linear Construction Projects. Technical guidance*' (C648) (Murnane et al., 2006) and with regard to the IFI guidance '*Guidelines on the Protection Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*' (IFI, 2016) to ensure the protection of watercourses located within and downstream of the Proposed Development site.

Mitigation Measures for Sediment Control and Water Pollution Control, as outlined in the NIS, are included in the Schedule of Mitigation in Appendix 4.1.

The following are measures which will be implemented by the appointed Contractor to minimise and avoid the effects of sedimentation during the proposed construction phase:

- All construction works will be confined to within the Proposed Development site boundary. No works will be undertaken outside of this area;
- Prior to any excavation works commencing, silt fences will be erected around water features (e.g. drainage ditches) to ensure sedimentation is prevented. A permeable fabric (Hy-Tex Terraston Premium silt fence, or similar) will be used instead of mesh. The silt fences will be positioned to allow an appropriate working area, but should not occur within areas prone to flood, or below the high-water mark. The silt fencing will be erected as per the manufacturer's guidelines, under the ECoW supervision and will be maintained until all ground disturbance has ceased and vegetation re-established. Once installed, the silt fence will be inspected regularly during construction and more frequently during heavy rainfall events. The ECoW will also be supervise the removal of the silt fences following the completion of the works.
- Once sediment control measures have been installed all exiting drainage ditches within the Proposed Development site will be blocked and rerouted around the works area.

- Blocking drains will raise water levels locally which will maintain groundwater levels higher and help to re-wet previously drained peat. As such, drain blocking will have a localised positive effect. Re-wetting is expected to reduce the leaching of ammonia and other chemical constituents (e.g. organic matter, dissolved organic carbon).
- The water in blocked drains will naturally undergo attenuation processes (such as nitrification of ammonia). Attenuation processes will continue to act as the water flows north to Mulgeeth Stream and along the Blackwater (Longwood) River in the downstream direction.
- All excavated peat will be stored within designated areas before being used for the construction of the berms within the Proposed Development. The stockpiles of peat will be covered by weighted plastic sheeting which will prevent any runoff. The berms will be seeded with peat tolerant grass and shrub plant species which will help compact the peat. In addition, the area of land located to the east of the berm located along the eastern perimeter will be vegetated and will act as a vegetative buffer.
- The bulk excavation works will not be carried out during or following heavy rainfall (i.e. if there is a yellow weather warning in place or 5 mm in a 1-hour period). Excavations will be covered with tarp or similar material, during high rainfall to avoid the creation of surface water with high concentrations of suspended solids that would require dewatering.

### **Mitigation Measures for Water Pollution Control**

The following are measures which will be implemented by the appointed Contractor to minimise and avoid the effects of water pollution during the proposed construction phase.

- The construction compound will be located within the Proposed Development, adjacent to the new landfill (refer to Drawing No. 11290-2010) which is set back from any water bodies.
- Bord na Móna has existing Emergency & Response and Spill Clean Up plans which will be referred to and implemented during the construction phase of the Proposed Development to deal with accidental spillages.
- Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of all construction vehicles. All machine operators and site staff will be fully trained in the use of this equipment.
- All machinery will be regularly maintained and checked for leaks. Services will only be undertaken within the construction compound or offsite.
- Refuelling will only occur within the construction compound under inspection by the ECoW or off-site away from the Proposed Development site. Re-fuelling onsite of construction equipment and the addition of hydraulic oil or lubricants to vehicles / equipment will take place in designated hard surface, bunded areas within the construction compound. If it is not possible to bring machinery to the refuelling point, fuel will be delivered in a double-skinned mobile fuel bowser. A drip tray will be used beneath the fill point during refuelling operations in order to contain any spillages that may occur.
- All concrete will be mixed off site and will be brought in as required and poured in place at site. No on-site batching will be permitted within the Proposed Development site.
- All concrete browsers will be washed down at a dedicated concrete washout area located within the construction compound or off site at a licensed facility. No chemicals that are deleterious to aquatic organisms will be used in cleaning works. All raw, uncured waste concrete will be cured at a designated location within the construction compound or off site.
- All concrete works will be scheduled during dry weather conditions only to reduce the elevated risk of runoff.



- All waste will be removed from the site and disposed of by an approved waste contractor in accordance with prevailing waste management regulations.
- On completion of the works, all apparatus, plant, tools, offices, sheds, surplus materials, rubbish and temporary erections or works of any kind will be removed from the site.
- Water intercepted from constructed roads and hardstanding areas will be similarly managed to ensure that uncontrolled water discharges do not take place to the receiving environment.
- Stormwater will be diverted through a sediment grit trap and oil interceptor, prior to discharge to the existing attenuation ponds and ICW.
- The existing wheelwash within the Proposed Development site will be used during the construction phase. Upon replenishment, the dirty water from the wheelwash will be discharged into the existing foul drainage network and transferred to the wastewater storage tank for blending with landfill leachate and removal off-site.

#### **4.7.7 Management of Fauna**

##### **Pre-construction Badger Survey**

In the event that construction works are delayed more than 12 months after the initial survey (undertaken in May 2022), a pre-construction badger survey will be undertaken within the Proposed Development site by an appropriately experienced ecologist, to identify any changes to badger activity, such as the establishment of new setts within the Zol of the Proposed Development. The pre-construction survey should be conducted no more than 10-12 months in advance of the construction works, as per the NRA (2005) guidelines. In the event that a sett is identified, a derogation license will be sought from NPWS.

##### **Protection of Nesting Birds**

Breeding bird habitats will not be removed, cleared or trimmed between the 1<sup>st</sup> March and 31<sup>st</sup> August, inclusive, to avoid impacts on nesting birds protected under the Irish *Wildlife Acts*. In the unforeseen circumstances where the construction programme does not allow this time restriction to be observed, then these areas will be inspected by a qualified ecologist for the presence of breeding birds prior to commencement of construction works. Where any nests are found, the appointed ECoW will provide recommendations as to whether a licence is required for vegetation removal and will detail the process for obtaining such derogation licence from the NPWS.

##### **Translocation of Frogs Spawn**

Due to the identification of local frogs occurrence along with the presence of suitable habitat within the proposed works area, a pre-construction frog spawn survey will be undertaken within wet grassland and drainage ditch habitats, which may be disturbed during the common frog's spawning season (1<sup>st</sup> March – 31<sup>st</sup> June, inclusive). In the event that frog spawn is identified within the footprint of the proposed works, a derogation license under Sections 9, 23 and 43 of the *Wildlife Acts* will be sought from NPWS. The derogation license, if required, will detail specific measures to translocate the frogs and spawn to suitable nearby habitat which will not be impacted by the Proposed Development.

##### **Protection of Aquatic Species**

No non-native fish species will be brought to, or released, within any water feature within the Proposed Development site.

## Disturbance / Displacement Measures

Measures to control noise as set out in Section 4.5 will minimise potential impacts on fauna within and adjacent to the works areas. To reduce disturbance caused by artificial light, all temporary lighting associated with the construction works will be strategically placed by the Contractor following consultation with the ECoW. This will ensure that illumination beyond the works area is controlled. Lighting will be cowed and directional to reduce significant light splay.

## Protection of Lepidoptera Species

The small skipper butterfly, the forester moth and the narrow-bordered five-spot burnet have been recorded in the wider area in Timahoe North Bog. Additionally, the orange-tip, small white and one small tortoiseshell butterflies have been recorded during walkover surveys within the Proposed Development site boundary. The construction of the Proposed Development will result in the loss of approximately 2.09 ha of dry meadow and grassy verges habitat, which was identified as potentially being suitable habitat for these lepidoptera species.

A HME Plan is included within Appendix 6-3 of the EIAR. This management plan outlines measures that will be implemented to protect and enhance suitable lepidoptera habitats present within the Proposed Development site. Construction phase mitigation measures are summarised below:

- The works area will be clearly defined and fenced off in advance of construction activities;
- Vegetation clearance will be carried out in phases;
- Natural recolonisation will be used for spoil stabilization; and
- Sub-peat material/mineral soils will be stored separately from the peat materials that will be used for capping.

Further details are included within the Plan.

## 4.8 WASTE MANAGEMENT

All waste generated from the Proposed Development will be managed in accordance with the provisions of the *Waste Management Act 1996* as amended and associated Regulations.

The Contractor will have regard to the provisions of the *Eastern-Midlands Region Waste Management Plan 2015-2021* and the provisions of the new *National Waste Management Plan for a Circular Economy* where this document is published and in force at the time of construction works. The Contractor will be required to identify measures for the avoidance and reduction of waste materials during the construction works in accordance with the waste hierarchy. Segregated waste skips will be provided in the construction compound to enforce source segregation. Skips will be maintained in good condition, labelled as to the type of waste to be placed in each and the area around skips will be kept clean. Smaller wheelie bins will be provided for storage of waste from the welfare facilities.

The Contractor will appoint a Waste Manager, with responsibility for the management and recording of waste generated as part of the Proposed Development. This may be the SHEQ Manager or other responsible person. The Waste Manager will ensure that all waste contractors appointed for the project have the correct collection permits for any waste streams they are removing from site, and that they are taking it to the appropriately licensed/permited waste facilities. Copies of waste collection permits and licences/permits for the waste destinations will be kept on file in the Site Office. The Waste Manager will also have responsibility for the implementation of these waste management measures at the site.

All excavated peat and subsoils will be reused within the site boundary and, as such, will not become waste material.

The following measures will be implemented on site:

- Main waste streams such as wood, metals and plastics will be segregated into skips in the construction compound for removal off-site by authorised waste contractors. Similarly, waste from welfare facilities will be segregated into non-recyclables, recyclables and organic waste;
- Where appropriate, waste generated from construction activity that cannot be reused or recycled off-site (such as organic waste and rubble), will be treated at the Dredging Waste Management Facility (DWMF) either in the composting facility, soils and C&D processing facility or disposed of to landfill;
- Any contaminated materials used for spills and equipment maintenance works will be separately stored in a suitable container for collection by an authorised hazardous waste contractor;
- The Contractor will encourage all project teams to minimise waste generation and to maximise the segregation of waste at source. Material wastage will be avoided by delivering only the required quantities of material to site and utilising off-site manufacturing, such as precast concrete, structural steel and steel reinforcement cages, as much as possible;
- The Contractor will establish 'just-in-time' deliveries to avoid excess material storage at the site which can lead to waste generation. Delivery drivers will be encouraged to remove any excess packaging from materials delivered to site and remove unused timber pallets, where possible;
- Reusable formwork from in-situ concrete works will be used where possible, in preference of non-reusable options;
- Due to the nature of the site, it is not anticipated that there will be contaminated peat or soils encountered during the excavation works. No contaminated soils were identified during the site investigation works;
- The SHEQ Officer, or other appropriate person, will be appointed as the Waste Manager for the duration of the project in accordance with the general guidance set out in the *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects*<sup>1</sup>, published by the EPA in November 2021;
- At the pre-construction stage, the Waste Manager will liaise with the Designers and procurement teams to design out waste as part of material orders and deliveries to site; and
- The Waste Manager will be responsible for auditing waste handling and storage throughout the project and for advising construction personnel on best practices. All waste collections and records of waste movement off-site will be collated by the Waste Manager and retained in the site office.

## 4.9 VEHICLE WASHING

A wheel wash will be installed on the exit from the construction compound to prevent the build-up of dirt on site roads and risk of generating debris on the public road network. A recirculating water type wheel wash will be used to minimise water consumption. All HGVs leaving the site will be required to pass through the wheel wash.

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<sup>1</sup> EPA *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects* (November 2021) - <https://www.epa.ie/publications/circular-economy/resources/CDWasteGuidelines.pdf> (26 August 2022)

Site access roads will be established early in the works to ensure HGVs are travelling on compacted hardcore surfaces and not mud/dirt tracks.

A road sweeper will be used if any section of the surrounding public roads becomes soiled by vehicles associated with the project.

## 5.0 EMERGENCY RESPONSE PLAN / PROCEDURES

This section presents a planning stage Emergency Response Plan (ERP) for the construction works and will be updated prior to commencement of construction to include details in relation to identifying the PSDP and PSCS, as well as emergency contact details. This ERP, and future revisions of the plan, will be agreed and coordinated with the Drehid WMF operations team to ensure it aligns with the prevailing emergency response procedures in place at the facility as part of the IE Licence. Refer to Section 2.2.13 of Chapter 2 of the EIAR for information regarding the management of emergency response at the operational facility.

The appointed PSCS will have responsibility for keeping the ERP up to date and for communicating with the facility operations team. The construction stage ERP is anticipated to form part of the Health & Safety Plan for the construction works.

### 5.1 EMERGENCY RESPONSE PROCEDURES

The ERP shall be activated in the event of an emergency such as an accident, fire, spillage, collapse etc. and at construction stage will provide names and contact details of who is required to be notified, location of first aid facilities and closest hospitals. The ERP will also include details of all personnel inducted and authorised to work on the site as well as next of kin contact details and relevant medical information.

In the event of an emergency, the PSCS and Project Manager will be notified immediately and will determine the scale of the emergency and the requirement for the assistance of emergency services. The Bord na Móna Project Manager and facility Operations Manager will also be notified. Works will cease in the area of the incident and contact will be maintained with the emergency services to direct them to the scene of the incident, as required.

As part of the ERP, an evacuation drill will be carried out on a regular basis to make all personnel aware of the procedure to be followed in the event of an emergency where a full site evacuation is required. Emergency muster point(s) will be identified at suitable locations and coordinated with the facility operations team. A record of all staff on site will be used to cross check workers attendance at the muster points. Records of evacuation drills will be maintained on site.

The ERP must include contact names and telephone numbers for the relevant local authorities (all sections/departments) including ambulance, fire brigade, An Garda Síochána and the HSA. Reporting of environmental emergencies to the local authority will be required as well as other relevant stakeholders such as IFI, NPWS or the EPA. Key contact details set out in the current Drehid WMF *General Emergency Preparedness & Response Procedure* document (Ref. EP 7.0) are provided in Table 5-1. This list will be expanded to include key site contact details and local emergency numbers in advance of construction commencement.

*Table 5-1 – Emergency contact list for Drehid Waste Management Facility*

| Emergency Contact List for Drehid Waste Management Facility |   |   |                          |
|---|---|---|--------------------------|
| Service/Agency  | Address   | Telephone Numbers                         | Fax/Email                |
| EPA Headquarters  | Johnstown Castle Estate, Wexford                  | 053 9160600<br>053 9160699<br>1890 335599 | info@epa.ie              |
| Kildare County Council                                      | Newbridge Road, Naas, Co. Kildare                 | 045-873800<br>045-980240                  | -                        |
| Inland Fisheries Ireland                                    | 3044 Lake Drive, Citywest Business Campus, Dublin | 01-8360060<br>01-8842600                  | info@fisheriesireland.ie |

## 5.2 INCIDENTS/COMPLAINTS

The IE Licence for the facility sets out the type of incidents occurring at the facility which must be notified to the EPA. The Bord na Móna Environmental Compliance Officer will provide information to the Contractor on the procedure to be followed in the event of an environmental incident occurring at the facility. The details will be recorded by the Contractor and provided to Bord na Móna who will notify the EPA, as required, via the online EDEN portal.

A Complaints Register, detailing any and all complaints received from the general public in respect of the operation of the facility, will be maintained at the site. This register will also record complaints occurring from construction activity at the site. A facility notice board is currently in place at the site entrance with contact information for any member of the public wishing to make a complaint.

All complaints received regarding the construction works will be recorded and categorised (e.g. noise, property damage, traffic, dust etc.) within the Complaints Register. This will include the following key details:

- Name, address and contact details of the complainant (with the complainant's permission);
- Brief outline of the complaint;
- Date of complaint;
- Name of person receiving complaint details; and
- Agreed timeline for response to complaint.

All complaints received by Bord na Móna will be communicated to the Contractor immediately so that the potential source(s) of the complaint can be stopped or shut down while the complaint is investigated. All complaints will be followed up and resolved in so far as is practicable. The complainant, Contractor and other stakeholders will be kept informed of the progress in resolving the complaint.

## 5.3 SPILL RESPONSE AND CONTROL

Accidental spills and leaks of fuels or other chemicals to surface water represent a significant risk to surface water quality and aquatic habitats. For the Proposed Development, relevant pathways are runoff, drains and shallow groundwater. The ultimate receiving water body is the Cushaling River.

In the event of a spill during construction activities, the following steps will be taken:

- Identification and elimination of the source of the spill;
- Alerting personnel in the vicinity of the spill and any possible dangers;
- Elimination of any potential ignition sources in the vicinity of the spill;
- Contain the spill using spill kits including absorbent materials and drain socks, as appropriate and prevent the contaminants from reaching water sources, gullies or exposed soils, where possible;
- Continue to apply absorbent materials to the spill until it is contained and transfer all contaminated materials into secure bags which can be sealed and prevented from leaking. The bags should then be transferred to a dedicated wheelie bin for temporary storage prior to removal from site by a suitably authorised waste contractor; and
- Notify the SHEQ Officer and ECoW of the spill to advise on any further course of action to take or notification of the appropriate regulatory body, such as the EPA or IFI.

## 6.0 CONSTRUCTION STAGE MONITORING

This section of the CEMP sets out the proposed environmental monitoring which will be carried out during construction activities. The measures in Table 6-1 reflect those set out in the EIAR and the NIS and provide a clear reference for the Contractor to ensure that all required monitoring is adhered to in advance of, during and after construction activities.



Table 6-1 – Construction Stage Monitoring

| No.  | Environmental Factor                  | EIAR/NIS Reference                         | Monitoring Required   |
|--|---------------------------------------|--|---|
| <b>Prior to Commencement of Construction</b> |                                       |  |   |
| MON1   | Biodiversity                          | EIAR Section 6.8.2.4<br>NIS Section 7.1.4  | <p>During the construction phase, surface water quality monitoring will be undertaken within drains near the construction activity and within the Cushaling River. Monitoring will be undertaken at existing monitoring points located at SW5 and SW6 and monitoring will be undertaken at the outflow of the new ICW and will be called SW9.</p> <p>In addition, water quality will also be monitored within the Mulgeeth Stream at SW10 where the watercourse exit the Bord a Móna landholding, during the construction phase. All Surface Water Monitoring Stations are illustrated on Figure 7-1 [of the NIS].</p> <p>All surface water sampling will be carried out by trained personnel from Bord na Móna or by suitably qualified consultants. All analyses, except for on-site readings, will be carried out off-site by an accredited laboratory. A visual inspection of all surface water streams on and adjacent to the Proposed Development will be carried out by site personnel on a weekly basis.</p> <p>The parameters; pH, specific electrical conductivity (SEC), dissolved oxygen (DO), temperature, and turbidity will be measured in the field, daily at each location, with the use of hand-held, calibrated water quality instruments. Suspended solids, pH, temperature and total ammonia will be sampled weekly for laboratory analyses:</p> <ul style="list-style-type: none"> <li>• 'Before' sampling will begin 4 weeks prior to activity commencing, in wet weather conditions.</li> </ul> |
| MON2   | Air Quality & Climate<br>Biodiversity | EIAR Section 2.2.11.1<br>NIS Section 8.1.6 | At least one month prior to the commencement of construction, dust gauges (Bergerhoff gauges) will be installed at five locations around the Proposed Development site and the baseline rate of dust generation will be recorded.   |
| MON3   | Hydrogeology                          | EIAR Section 7.5.2.4                       | <p>Groundwater levels will be monitored during the entire construction period (and beyond) using existing monitoring wells. The monitoring will entail:</p> <ul style="list-style-type: none"> <li>• Groundwater level measurement.</li> <li>• Groundwater quality sampling and analyses.</li> </ul> <p>Groundwater levels will be measured manually on a monthly basis in all existing wells. Ten wells around the landfill expansion area will also be equipped with pressure transducers to record water levels automatically and continuously. Water levels will be similarly gauged in the main drain to the east of the landfill footprint to be able to use the data to document groundwater-surface water interaction on a long-term basis during the 24-year construction period (and beyond).</p>   |

|      |       |                     |   |
|------|-------|---------------------|---|
|      |       |                     | <p>The detailed water level monitoring will begin six months prior to construction and will continue through the post-closure period.</p>   |
| MON4 | Water | EIAR Section 8.4.19 | <p>Field monitoring campaigns will be undertaken in drains near construction activity and in the Cushaling River. Field monitoring involves a) daily visual checks, and b) daily measurements of field parameters water temperature, pH, specific electrical conductivity (SEC), alkalinity and turbidity at relevant locations upstream and downstream of active construction works and where the Cushaling River exits Timahoe South Bog. Field measurements will be conducted with hand-held, calibrated water quality instruments.</p> <p>The field campaign will begin two weeks prior to activity commencement and will cease up to two weeks after activity is completed, unless observations dictate that measurements should continue. Regular inspections of all installed drainage features will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended.</p> <p>In addition to field observations and measurements, surface water samples will be taken at selected locations to monitor for effects and any shifts in baseline conditions over the longer term. Samples will be collected from:</p> <ul style="list-style-type: none"> <li>• The same stations which currently define BnM's compliance monitoring associated with the existing WMF, i.e. from stations SW6, SW5 and SW4.</li> <li>• The inflow to new SWLs which represents the combination of stormwater that is collected by the perimeter drains around the expanded landfill and the new under cell drainage system which will be installed beneath individual phases.</li> <li>• The outflow from the new ICW which will become an additional compliance point for licensed discharges (also associated with the expanded landfill).</li> </ul> <p>During all phases of works:</p> <ul style="list-style-type: none"> <li>• Monthly samples will be analysed for general physico-chemical parameters, nutrients, suspended solids, dissolved organic carbon, and true colour.</li> <li>• Quarterly samples will include analyses for dissolved metals and a suite of oil and fuel-related constituents.</li> </ul> |
| MON5 | Water | EIAR Section 8.4.20 | <p>Data loggers for automatic water level measurements will be installed:</p> <ul style="list-style-type: none"> <li>• In one new SWL</li> <li>• On the outfall from the new ICW</li> <li>• On the Cushaling River, where it exits the BnM landholding</li> <li>• On Mulgeeth Stream, where it exits the BnM landholding</li> </ul> <p>Data loggers will be installed in secured standpipes and set to measure water levels continuously throughout the construction phase.</p>   |

|                                |  |                       |  |                                |  |  |                |                 |
|--------------------------------|--|-----------------------|--|--------------------------------|--|--|----------------|-----------------|
|                                |  |                       | <p>In the two rivers/streams, the baseline monitoring will commence three months prior to commencement of the construction phase.</p> <p>In the new settlement lagoons and ICW system (for the expanded landfill), baseline monitoring will commence immediately upon their construction and commissioning.</p> <p>To supplement the river/stream water level monitoring, flow measurements will also be taken manually at each location using standard flow meter equipment. All data will be periodically reviewed to assess whether changes (trends) to water quality and cumulative effects are occurring.</p>   |                                |  |  |                |                 |
| MON6                           | Archaeology                              | EIAR Section 13.7.1   | <p>An experienced and competent licence-eligible archaeologist will be employed to undertake archaeological probing and testing at the site of the unclassified togher (KD008:038----) and in the area of the Proposed Development infrastructure adjacent to the unclassified togher (KD009-029), located 40 m east of the Proposed Development infrastructure.</p> <p>In the event of archaeological features, finds and/or deposits been encountered during the monitoring, all relevant authorities should be notified immediately. Preservation in-situ or preservation by record (excavation) may be required.</p>   |                                |  |  |                |                 |
| <b>During Construction</b>     |  |                       |  |                                |  |  |                |                 |
| MON7                           | Air Quality & Climate                    | EIAR Section 2.2.11.1 | <p>Dust monitoring (at the five identified locations) will be undertaken on a monthly basis for the duration of the construction phase.</p> <p>In addition, the site and adjoining roads will be inspected on a daily basis for evidence of excessive generation of airborne dust. This inspection will be carried out firstly by Bord na Móna personnel and will also be a Contractual requirement imposed on the Contractors during construction activities.</p>   |                                |  |  |                |                 |
| MON8                           | Hydrogeology                             | EIAR Section 7.5.2.4  | <p>During all phases of works, groundwater quality monitoring will continue within TSB, according to BnM's existing monitoring regime and routines, including the compliance wells referred to in Section 7.4.25 of the EIAR. It is proposed to add the following wells to compliance reporting, notably:</p> <ul style="list-style-type: none"> <li>• The MW-02 well cluster, which is hydraulically downgradient of the landfill expansion and new ICW.</li> <li>• The MW-07 well cluster, which is hydraulically upgradient of the landfill expansion.</li> </ul> <p>It is proposed that monitoring be conducted according to Schedule C, Section C.3 (Ambient Monitoring) of existing IE discharge licence W0201-03, which covers the parameters listed a follows.</p> <table border="1" style="width: 100%; margin-top: 10px;"> <tr> <td rowspan="2" style="background-color: #00AEEF; color: white; text-align: center; vertical-align: middle;"><b>All Construction Phases</b></td> <td colspan="2" style="background-color: #00AEEF; color: white; text-align: center;"><b>Compliance and New Proposed Wells</b></td> </tr> <tr> <td style="background-color: #00AEEF; color: white; text-align: center; width: 50%;"><b>Monthly</b></td> <td style="background-color: #00AEEF; color: white; text-align: center; width: 50%;"><b>Annually</b></td> </tr> </table> | <b>All Construction Phases</b> | <b>Compliance and New Proposed Wells</b> |  | <b>Monthly</b> | <b>Annually</b> |
| <b>All Construction Phases</b> | <b>Compliance and New Proposed Wells</b> |                       |  |                                |  |  |                |                 |
|                                | <b>Monthly</b>                           | <b>Annually</b>       |  |                                |  |  |                |                 |

|      |       |                     |   |   |   |
|------|-------|---------------------|---|---|---|
|      |       |                     | Visual inspection/odour   | x |   |
|      |       |                     | Groundwater levels (wells)  | x |   |
|      |       |                     | Specific Electrical Conductivity  | x |   |
|      |       |                     | Ammoniacal Nitrogen   | x |   |
|      |       |                     | Chloride  | x |   |
|      |       |                     | Sulphate (as SO <sub>4</sub> )  |   | x |
|      |       |                     | Metals/non-metals   |   | x |
|      |       |                     | List I/II Organic Substances  |   | x |
|      |       |                     | Mercury   |   | x |
|      |       |                     | Nitrate as N  |   | x |
|      |       |                     | Orthophosphate as P   |   | x |
|      |       |                     | Total Phosphorus as P   |   | x |
|      |       |                     | Faecal Coliforms  |   | x |
|      |       |                     | Total Coliforms   |   | x |
|      |       |                     | <p>Groundwater monitoring will be undertaken as above and as practiced by BnM, during the entire construction and operational period, using existing monitoring wells. Groundwater levels will be measured manually on a monthly basis in all existing wells. Ten no. wells around the landfill expansion area will also be equipped with pressure transducers to record water levels automatically and continuously.</p> <p>All monitoring is undertaken to check that the Proposed Development “in practice conforms to predictions made in the current Chapter and to identify and record if any unforeseen effects occur, in order to undertake appropriate remedial action” (EPA, 2022).</p> <p>The detailed water level monitoring will begin six months prior to construction and will continue through the post-closure period.</p> |   |   |
| MON9 | Water | EIAR Section 8.4.19 | <p>During all phases of works, surface water quality will be measured in the field and monitored via sampling and laboratory analyses.</p> <p>The field monitoring will be undertaken to check for potential effects of construction works. The sampling and laboratory analysis will be conducted to check for potential shifts in baseline water quality conditions. Because construction and operations of new landfill phases take place in parallel, both field measurements and sampling activity will be ongoing throughout the lifespan of the expanded landfill.</p>   |   |   |

|                                       |                                      |                     | <p>To monitor construction-related activity, it is proposed that field measurements be taken at key locations as follows:</p> <ul style="list-style-type: none"> <li>Existing station SW5 which measures the outflow to the Cushaling River</li> <li>A new station SW10 which will measure the outflow to Mulgeeth Stream</li> <li>Existing station SW6 which measures the discharge from the existing ICW at the WMF</li> <li>A new station SW9 which will measure the discharge from the new ICW associated with the landfill expansion.</li> </ul> <p>The construction-related monitoring of discharges and water courses will consist of:</p> <ul style="list-style-type: none"> <li>Daily visual checks</li> <li>Daily measurements of key parameters, namely temperature, pH, SEC, total alkalinity, turbidity, and total colour.</li> </ul> <p>Field measurements will be taken using calibrated, hand-held water quality instruments ('multi-parameter probes'). The field measurement campaign will begin one month prior to Stage 1 construction and will cease up to one month after construction of the last waste cell (phase) is completed, unless observations dictate that measurements should continue.</p> <p>Regular visual inspections of all installed drainage features will be undertaken, especially after heavy rainfall. The intent is to avoid build-up of standing water where it is not intended. If visible impact during construction occurs, works will be suspended at the discretion of the supervising engineer, in which case the problem will be identified and corrective action taken before recommencing works.</p> |                         |                     |  |  |  |       |        |           |          |                           |  |  |  |  |        |   |  |  |  |             |   |  |  |  |    |   |  |  |  |                                  |   |  |  |  |                                       |   |  |  |  |           |   |  |  |  |              |   |  |  |  |                                     |                                      |  |  |  |
|---------------------------------------|--------------------------------------|---------------------|---|-------------------------|---------------------|--|--|--|-------|--------|-----------|----------|---------------------------|--|--|--|--|--------|---|--|--|--|-------------|---|--|--|--|----|---|--|--|--|----------------------------------|---|--|--|--|---------------------------------------|---|--|--|--|-----------|---|--|--|--|--------------|---|--|--|--|-------------------------------------|--------------------------------------|--|--|--|
| MON10                                 | Water                                | EIAR Section 8.4.20 | <p>It is proposed to measure discharge rates from the new ICW. This will be accomplished by means of a flowmeter installation by station SW9 which will record discharges continuously.</p> <table border="1" data-bbox="922 951 2022 1398"> <thead> <tr> <th rowspan="2">All Construction Phases</th> <th colspan="4">SW5, SW6, SW9, SW10</th> </tr> <tr> <th>Daily</th> <th>Weekly</th> <th>Quarterly</th> <th>Annually</th> </tr> </thead> <tbody> <tr> <td colspan="5"><b>Field Measurements</b></td> </tr> <tr> <td>Visual</td> <td>x</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Temperature</td> <td>x</td> <td></td> <td></td> <td></td> </tr> <tr> <td>pH</td> <td>x</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Specific Electrical Conductivity</td> <td>x</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total Alkalinity as CaCO<sub>3</sub></td> <td>x</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Turbidity</td> <td>x</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total Colour</td> <td>x</td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>Expanded Landfill Operations</b></td> <td colspan="4"><b>Attenuation Lagoons (Outlets)</b></td> </tr> </tbody> </table>   | All Construction Phases | SW5, SW6, SW9, SW10 |  |  |  | Daily | Weekly | Quarterly | Annually | <b>Field Measurements</b> |  |  |  |  | Visual | x |  |  |  | Temperature | x |  |  |  | pH | x |  |  |  | Specific Electrical Conductivity | x |  |  |  | Total Alkalinity as CaCO <sub>3</sub> | x |  |  |  | Turbidity | x |  |  |  | Total Colour | x |  |  |  | <b>Expanded Landfill Operations</b> | <b>Attenuation Lagoons (Outlets)</b> |  |  |  |
| All Construction Phases               | SW5, SW6, SW9, SW10                  |                     |   |                         |                     |  |  |  |       |        |           |          |                           |  |  |  |  |        |   |  |  |  |             |   |  |  |  |    |   |  |  |  |                                  |   |  |  |  |                                       |   |  |  |  |           |   |  |  |  |              |   |  |  |  |                                     |                                      |  |  |  |
|                                       | Daily                                | Weekly              | Quarterly   | Annually                |                     |  |  |  |       |        |           |          |                           |  |  |  |  |        |   |  |  |  |             |   |  |  |  |    |   |  |  |  |                                  |   |  |  |  |                                       |   |  |  |  |           |   |  |  |  |              |   |  |  |  |                                     |                                      |  |  |  |
| <b>Field Measurements</b>             |                                      |                     |   |                         |                     |  |  |  |       |        |           |          |                           |  |  |  |  |        |   |  |  |  |             |   |  |  |  |    |   |  |  |  |                                  |   |  |  |  |                                       |   |  |  |  |           |   |  |  |  |              |   |  |  |  |                                     |                                      |  |  |  |
| Visual                                | x                                    |                     |   |                         |                     |  |  |  |       |        |           |          |                           |  |  |  |  |        |   |  |  |  |             |   |  |  |  |    |   |  |  |  |                                  |   |  |  |  |                                       |   |  |  |  |           |   |  |  |  |              |   |  |  |  |                                     |                                      |  |  |  |
| Temperature                           | x                                    |                     |   |                         |                     |  |  |  |       |        |           |          |                           |  |  |  |  |        |   |  |  |  |             |   |  |  |  |    |   |  |  |  |                                  |   |  |  |  |                                       |   |  |  |  |           |   |  |  |  |              |   |  |  |  |                                     |                                      |  |  |  |
| pH                                    | x                                    |                     |   |                         |                     |  |  |  |       |        |           |          |                           |  |  |  |  |        |   |  |  |  |             |   |  |  |  |    |   |  |  |  |                                  |   |  |  |  |                                       |   |  |  |  |           |   |  |  |  |              |   |  |  |  |                                     |                                      |  |  |  |
| Specific Electrical Conductivity      | x                                    |                     |   |                         |                     |  |  |  |       |        |           |          |                           |  |  |  |  |        |   |  |  |  |             |   |  |  |  |    |   |  |  |  |                                  |   |  |  |  |                                       |   |  |  |  |           |   |  |  |  |              |   |  |  |  |                                     |                                      |  |  |  |
| Total Alkalinity as CaCO <sub>3</sub> | x                                    |                     |   |                         |                     |  |  |  |       |        |           |          |                           |  |  |  |  |        |   |  |  |  |             |   |  |  |  |    |   |  |  |  |                                  |   |  |  |  |                                       |   |  |  |  |           |   |  |  |  |              |   |  |  |  |                                     |                                      |  |  |  |
| Turbidity                             | x                                    |                     |   |                         |                     |  |  |  |       |        |           |          |                           |  |  |  |  |        |   |  |  |  |             |   |  |  |  |    |   |  |  |  |                                  |   |  |  |  |                                       |   |  |  |  |           |   |  |  |  |              |   |  |  |  |                                     |                                      |  |  |  |
| Total Colour                          | x                                    |                     |   |                         |                     |  |  |  |       |        |           |          |                           |  |  |  |  |        |   |  |  |  |             |   |  |  |  |    |   |  |  |  |                                  |   |  |  |  |                                       |   |  |  |  |           |   |  |  |  |              |   |  |  |  |                                     |                                      |  |  |  |
| <b>Expanded Landfill Operations</b>   | <b>Attenuation Lagoons (Outlets)</b> |                     |   |                         |                     |  |  |  |       |        |           |          |                           |  |  |  |  |        |   |  |  |  |             |   |  |  |  |    |   |  |  |  |                                  |   |  |  |  |                                       |   |  |  |  |           |   |  |  |  |              |   |  |  |  |                                     |                                      |  |  |  |





|       |                          |  |  |
|-------|--------------------------|--|--|
| MON12 | Surface Water Monitoring | <p>EIAR Section 6.8.2.4</p> <p>NIS Section 7.1.4</p> | <p>During the construction phase, surface water quality monitoring will be undertaken within drains near the construction activity and within the Cushaling River. Monitoring will be undertaken at existing monitoring points located at SW5 and SW6 and monitoring will be undertaken at the outflow of the new ICW and will be called SW9.</p> <p>In addition, water quality will also be monitored within the Mulgeeth Stream at SW10 where the watercourse exit the Bord a Móna landholding, during the construction phase. All Surface Water Monitoring Stations are illustrated on Figure 7-1 [of the NIS].</p> <p>All surface water sampling will be carried out by trained personnel from Bord na Móna or by suitably qualified consultants. All analyses, except for on-site readings, will be carried out off-site by an accredited laboratory. A visual inspection of all surface water streams on and adjacent to the Proposed Development will be carried out by site personnel on a weekly basis.</p> <p>The parameters; pH, specific electrical conductivity (SEC), dissolved oxygen (DO), temperature, and turbidity will be measured in the field, daily at each location, with the use of hand-held, calibrated water quality instruments. Suspended solids, pH, temperature and total ammonia will be sampled weekly for laboratory analyses:</p> <ul style="list-style-type: none"> <li>• ‘Before’ sampling will begin 4 weeks prior to activity commencing, in wet weather conditions.</li> <li>• “During” sampling will occur during or immediately following rainfall events.</li> <li>• The ‘after’ sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (where an effect has been shown). The sampling will be limited to flowing waters.</li> </ul> <p>This supplements BnMs’ routine compliance monitoring programme (under license).</p> |
| MON13 | Groundwater              | NIS Section 7.1.5                                    | <p>Existing groundwater wells will be monitored during construction works to determine the influence of any dewatering required for construction of the new landfill. All groundwater monitoring will be carried out by trained personnel in accordance with best practice sampling guidance. Samples will be collected and sent off-site to accredited laboratories for analysis.</p>   |
| MON14 | Air Quality & Climate    | EIAR Section 12.5.1                                  | <p>Monitoring of the embodied carbon in the construction phase will be conducted. The aim of the monitoring will be to seek further ways to minimise climate impacts. Monitoring will include; embodied carbon of construction materials, water usage, power and fuel usage and waste generation (including reuse and recycling rates). Where monitoring shows the Proposed Development is not meeting its targets further mitigation will be put in place.</p>  |
| MON15 | Air Quality & Climate    | EIAR Section 12.6                                    | <p>Monitoring of dust in accordance with the IE Licence requirements.</p>  |
| MON16 | Archaeology              | EIAR Section 13.7.2                                  | <p>All ground disturbance associated with the construction of the Proposed Development will be monitored by a suitably qualified archaeologist working under licence as issued by the minister (DHLGH) under section 26 of the National Monuments Acts (1994-2014).</p>  |

|                          |                     |   |  |
|--------------------------|---------------------|---|--|
|                          |                     |   | In the event of archaeological features, finds and/or deposits being encountered during the monitoring, all relevant authorities should be notified immediately. Preservation in-situ or preservation by record (excavation) may be required.  |
| MON17                    | Traffic & Transport | EIAR Section 14.11                        | Continuous monitoring of haul roads throughout the construction phase.   |
| <b>Post Construction</b> |                     |   |  |
| MON18                    | Biodiversity        | EIAR Section 6.8.2.4<br>NIS Section 7.1.4 | <p>During the construction phase, surface water quality monitoring will be undertaken within drains near the construction activity and within the Cushaling River. Monitoring will be undertaken at existing monitoring points located at SW5 and SW6 and monitoring will be undertaken at the outflow of the new ICW and will be called SW9.</p> <p>In addition, water quality will also be monitored within the Mulgeeth Stream at SW10 where the watercourse exit the Bord a Móna landholding, during the construction phase. All Surface Water Monitoring Stations are illustrated on Figure 7-1 [of the NIS].</p> <p>All surface water sampling will be carried out by trained personnel from Bord na Móna or by suitably qualified consultants. All analyses, except for on-site readings, will be carried out off-site by an accredited laboratory. A visual inspection of all surface water streams on and adjacent to the Proposed Development will be carried out by site personnel on a weekly basis.</p> <p>The parameters; pH, specific electrical conductivity (SEC), dissolved oxygen (DO), temperature, and turbidity will be measured in the field, daily at each location, with the use of hand-held, calibrated water quality instruments. Suspended solids, pH, temperature and total ammonia will be sampled weekly for laboratory analyses:</p> <ul style="list-style-type: none"> <li>The 'after' sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (where an effect has been shown). The sampling will be limited to flowing waters.</li> </ul> <p>This supplements BnMs' routine compliance monitoring programme (under license).</p> |
| MON19                    | Water               | EIAR Section 8.4.19                       | <p>During all phases of works, surface water quality will be measured in the field and monitored via sampling and laboratory analyses.</p> <p>The field monitoring will be undertaken to check for potential effects of construction works. The sampling and laboratory analysis will be conducted to check for potential shifts in baseline water quality conditions. Because construction and operations of new landfill phases take place in parallel, both field measurements and sampling activity will be ongoing throughout the lifespan of the expanded landfill. To monitor construction-related activity, it is proposed that field measurements be taken at key locations as follows:</p> <ul style="list-style-type: none"> <li>Existing station SW5 which measures the outflow to the Cushaling River</li> </ul>  |

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|  |  |  | <ul style="list-style-type: none"> <li>• A new station SW10 which will measure the outflow to Mulgeeth Stream</li> <li>• Existing station SW6 which measures the discharge from the existing ICW at the WMF</li> <li>• A new station SW9 which will measure the discharge from the new ICW associated with the landfill expansion.</li> </ul> <p>The construction-related monitoring of discharges and water courses will consist of:</p> <ul style="list-style-type: none"> <li>• Daily visual checks</li> <li>• Daily measurements of key parameters, namely temperature, pH, SEC, total alkalinity, turbidity, and total colour.</li> </ul> <p>Field measurements will be taken using calibrated, hand-held water quality instruments ('multi-parameter probes'). The field measurement campaign will begin one month prior to Stage 1 construction and will cease up to one month after construction of the last waste cell (phase) is completed, unless observations dictate that measurements should continue.</p> <ul style="list-style-type: none"> <li>• Regular visual inspections of all installed drainage features will be undertaken, especially after heavy rainfall. The intent is to avoid build-up of standing water where it is not intended. If visible impact during construction occurs, works will be suspended at the discretion of the supervising engineer, in which case the problem will be identified and corrective action taken before recommencing works.</li> </ul> |
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## Appendix 4.1 – Schedule of Mitigation Measures

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## 16.0 SCHEDULE OF MITIGATION MEASURES

### 16.1 INTRODUCTION

This chapter of the EIAR provides a summary of the findings of this EIAR, based on the design and mitigation measures identified within the technical assessments of this report. This schedule below details the measures upon which the findings of this EIAR have been based and are an integral part of the proposed project.

During the construction, operational and decommissioning phases of the project, all personnel working on the project will be required to be responsible for the environmental control of their own work and to perform their duties in accordance with the requirements and procedures of the CEMP (See Appendix 2-5). All works associated with the construction of the proposed project will be undertaken with due regard to the guidance contained within CIRIA Document C741 'Environmental Good Practice on Site' (CIRIA,2015).

### 16.2 SCHEDULE OF MITIGATION MEASURES FROM EIAR

The following table provides a summary of the mitigation measures proposed within this EIAR. In addition, the monitoring proposals have been included.

| Ref No.  | Relevant EIAR topic                    | Location       | Mitigation Measure  | Monitoring Requirements                  |
|--|--|----------------|---|--|
| <b>Pre-construction Phase</b>                  |  |                |   |  |
| <b>Description of the Proposed Development</b> |  |                |   |  |
| MM1  | CEMP                                   | EIAR Chapter 2 | The CEMP is a live document and will be reviewed and updated, as necessary, throughout the construction of the development. Upon appointment, the Main Contractor(s) for construction of the project shall update this document to produce a construction stage CEMP which will account for any additional requirements set out in Planning Conditions or agreed upon with the Planning Authority or other relevant Bodies post planning submission.  | As required through the contractors CEMP |
| MM2  | Health and Safety and Site Emergencies | EIAR Chapter 2 | An updated Emergency Response Plan will be prepared and maintained at the proposed development. The Plan, which will be based on the Emergency Response Plan for the existing facility, will detail any emergency situation which could occur on site and the proposed response should this emergency occur. A copy of the existing Emergency Response Procedures which make up the Emergency Response Plan are included in Appendix 2-8, and these will be updated in accordance with the proposed development as part of the IE Licence Review. The updated Emergency Response Plan will detail procedures for the following occurrences:<br>ERP 02 Spill Clean-up Procedure<br>ERP 03 Fire / Explosion Procedure<br>ERP 04 Malicious Damage Procedure<br>ERP 05 Unforeseen Emergencies | As required through the contractors CEMP |
| <b>Biodiversity</b>                            |  |                |   |  |
| MM3  | Invasive Species                       | EIAR Chapter 6 | No invasive plant species were recorded within the proposed development. However, in the event that proposed construction works are delayed more than 18 months, a pre-construction invasive species survey will be undertaken as recommended within the CIEEM Advice Note (CIEEM, 2019). In the event that an invasive plant species, listed in Part 1 of the Third Schedule of S.I No. 477/2011 – European Communities (Birds and Natural Habitats) Regulations 2011 is recorded a site-specific Invasive Species Management Plan (ISMP) will be prepared.  | As required through the contractors CEMP |



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| MM4  | Badger                       | EIAR Chapter 6  | <p>In the event that construction works are delayed more than 12 months after the initial survey (undertaken in May 2022), a pre-construction badger survey will be undertaken within the proposed development site by an appropriately experienced ecologist, to identify any changes to badger activity, such as the establishment of new setts within the Zone Of Influence of the proposed development.</p> <p>The pre-construction survey should be conducted no more than 10-12 months in advance of the construction works, as per the NRA (2005) guidelines.</p> <p>In the event that a sett is identified, a derogation license will be sought from NPWS</p>   | As required through the contractors CEMP   |
| MM5  | Translocation of Frogs Spawn | EIAR Chapter 6  | <p>It is recommended that a pre-construction frog spawn survey is undertaken within wet grassland and drainage ditch habitats, which may be disturbed during the common frog's spawning season (1st March – 31st June, inclusive).</p> <p>In the event that frog spawn is identified within the footprint of the proposed works, a derogation license under Sections 9, 23 and 43 of the Wildlife Acts will be sought from NPWS. The derogation license, if required, will detail specific measures to translocate the frogs and spawn to suitable nearby habitat which will not be impacted by the proposed development.</p>   | As required through the contractors CEMP   |
| <b>Archaeology &amp; Cultural Heritage</b> |                              |                 |   |  |
| MM6  | Archaeological Management    | EIAR Chapter 13 | <p>An experienced and competent licence-eligible archaeologist will be employed to undertake archaeological probing and testing at the site of the unclassified togher (KD008:038----).</p> <p>In the event of archaeological features, finds and/or deposits been encountered during the monitoring, all relevant authorities should be notified immediately. Preservation in-situ or preservation by record (excavation) may be required.</p> <p>An experienced and competent licence-eligible archaeologist will be employed to undertake archaeological probing and testing in the area of the proposed development infrastructure adjacent to the unclassified togher (KD009-029), located 40 m east of the proposed development infrastructure.</p> | An experienced and competent licence-eligible archaeologist will be employed to undertake archaeological probing and testing at the site |

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|  |  |                | <p>In the event of archaeological features, finds and/or deposits been encountered during the monitoring, all relevant authorities should be notified immediately. Preservation in-situ or preservation by record (excavation) may be required. Fencing will be erected, under archaeological supervision, at the boundary of the proposed development site in the vicinity of two trackways or toghers, (KD008-029001 &amp; KD008-030) located to the north of the existing landfill facility. The fencing will be erected to ensure that no construction traffic extends beyond the limit of the proposed development infrastructure in this area.</p>   |  |
| <b>Construction Phase</b>                      |  |                |  |  |
| <b>Description of the Proposed Development</b> |  |                |  |  |
| MM7  | Health and Safety and Site Emergencies | EIAR Chapter 2 | <p>Any accidents and other emergencies will be handled by on-site personnel in accordance with Bord na Móna emergency response procedures. Emergency response contact numbers for the relevant authorities including the Fire Service, Gardaí, and Ambulance Services will be prominently posted on-site. All site operatives and other relevant employees of Bord na Móna will be regularly trained in emergency response procedures and in fire prevention and control.</p> <p>Site safety procedures will be adopted to protect any persons from injury on-site. Should injury occur, the trained site operatives, where appropriate, will be the first to administer assistance. Emergency and first-aid materials will be available in the existing and proposed site buildings. Emergency and first-aid procedures will also be prominently displayed in the site buildings, and adjacent to the surface water lagoons.</p> <ol style="list-style-type: none"> <li>1. An updated Emergency Response Plan will be prepared and maintained at the proposed development. The Plan, which will be based on the Emergency Response Plan for the existing facility, will detail any emergency situation which could occur on site and the proposed response should this emergency occur. A copy of the existing Emergency Response Procedures which make up the Emergency Response Plan are included in Appendix 2-8, and these will be updated in accordance with the proposed development as part of the IE Licence Review. The updated Emergency Response Plan will detail procedures for the following occurrences:</li> </ol> | As required through the contractors CEMP |

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|  |  |  | <p>ERP 02 Spill Clean-up Procedure<br/> ERP 03 Fire / Explosion Procedure<br/> ERP 04 Malicious Damage Procedure<br/> ERP 05 Unforeseen Emergencies</p> <p>2. Should an emergency situation occur, the relevant response procedure documented within the Emergency Response Plan will be implemented. Each procedure details the emergency situation, the proposed response should this emergency occur and the potential environmental impacts of this occurrence.</p> <p>3. The Facility Manager shall assume the role of Site Incident Controller, with responsibility for:</p> <ul style="list-style-type: none"> <li>• assessing the scale of the incident;</li> <li>• informing emergency services; and</li> <li>• directing rescue and fire-fighting operations.</li> </ul> <p>In the absence of the Facility Manager, the designated Environmental Officer shall assume the role of Site Incident Controller.</p> <p>4. In an emergency situation, the Facility Manager shall be contacted immediately via the two-way radio system. The weighbridge radio shall act as the main point of contact for the Facility Manager.</p> <p>5. Following an emergency, the Facility Manager (or in his absence the designated Environmental Officer) shall record the details of the incident. An Environmental Incident Investigation and Reporting Form (EPF 8.1) shall be completed which is located within the procedure for Environmental Incident Investigation and Reporting (EMS Environmental Procedure EP 8.0). Following the environmental incident, appropriate procedures shall be implemented, i.e., Environmental Non-Conformance Procedure (EP 9.0) and Environmental Corrective and Preventative Action Procedure (EP 10.0).</p> <p>6. This procedure shall be reviewed by the Environmental Management Team, annually or after the occurrence of an 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 Environmental Management Team.</p> |  |
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|      |                     |                | <ol style="list-style-type: none"> <li>7. The Facility Manager shall notify the EPA as soon as possible after the occurrence of an incident as per procedure EP 17.0 Reporting</li> <li>8. In the case of any incident which relates to discharges to water, the Facility Manager shall notify the Local Authorities and the IFI as soon as practicable after the incident.</li> <li>9. On a weekly basis, all emergency response equipment shall be checked to ensure it is provided in agreed quantities and in suitable working order. The dust suppression water bowser shall be checked on a daily basis to ensure that it is full of water.</li> <li>10. In the case that an emergency situation arises outside the hours of operation, the security person shall immediately contact the designated person on call.</li> </ol> |  |
| MM8  | Breakdowns          | EIAR Chapter 2 | The regular maintenance of all plant and equipment utilised on-site will be undertaken in accordance with the manufacturer's guidelines. This maintenance programme will help to minimise occurrences of breakdowns on-site. In the event of any breakdown, the item of plant or equipment will be promptly repaired or replaced. A new maintenance building is proposed to facilitate this maintenance programme. All plant and equipment will be checked on a daily basis.  | As required through the contractors CEMP |
| MM9  | Staffing            | EIAR Chapter 2 | Off-roster fully trained staff will be deployed to the site in the event of sickness to key personnel. This will also apply to general site operatives and plant operators. If required, plant operators will be sourced from local plant contractors should the need arise.  | As required through the contractors CEMP |
| MM10 | Out of normal hours | EIAR Chapter 2 | <p>Site personnel and other employees of Bord na Móna will be available in the event of any emergency at the site outside of normal working hours. An emergency contact number will be prominently posted at the existing entrance at the R403 Regional Road.</p> <p>Local emergency services will be informed of contact numbers for key Bord na Móna personnel. Outside normal working hours, security personnel will also be provided at the site who will also have the relevant contact numbers. These security arrangements will be implemented in order to guard against unlawful trespass and vandalism. Basic routines will exist whereby any cash, records and</p>  | As required through the contractors CEMP |

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|      |                             |                | equipment will either be taken off-site daily or secured within the administration building. These procedures will be in the interest of overall security.  |  |
| MM11 | Environmental Contamination | EIAR Chapter 2 | <p>It is important to note that leachate and wastewater will be collected, fully contained and will be fully isolated from the surface water collection system during the lifetime of the facility.</p> <p>The discharge from the surface water lagoons through the ICWs to the existing bog drains and eventually the Cushaling River will be monitored continuously in respect of electrical conductivity, dissolved oxygen and flow rate. In the unlikely event that deterioration in the surface water quality being discharged is detected, an automated isolating valve will close. This isolating valve will allow for the retention of all surface water on-site until the contamination event is investigated and remediated. This protection measure will be in place throughout the construction, operation and decommissioning phases.</p>  | As required through the contractors CEMP |
| MM12 | Out of normal hours         | EIAR Chapter 2 | <p>The proposed development will operate six days per week (Monday to Saturday inclusive) between the hours of 07:30 and 19:00.</p> <p>While machinery handling and transferring waste in the MSW processing and compost plant (proposed and existing) will only operate within the above hours, the composting process will operate on a continuous basis as the stockpiled material breaks down and stabilises in the designated compost tunnels. Odour controls and biodegradation monitoring processes will be fully automated to allow them to operate effectively on a continuous basis.</p> <p>Pumping of leachate from the landfill to the storage compound and the drawing of landfill gas into the compound for electrical generation/flaring will also be carried out on a continuous basis (refer to Section 2.3.3 and 2.3.4 of the EIAR). Monitoring equipment will be connected to a central control system which will notify designated persons, such as the Facility Manager or other designated emergency contact, in the event of abnormal readings outside of the defined operating hours.</p> <p>Waste material will only be accepted into or depart from the facility between the hours of 07:30 and 18:30 (Monday to Saturday). In exceptional circumstances, such as vehicle breakdown or similar unavoidable delay, the facility will permit the late arrival of waste after 18:30, however this will only be permitted where there</p> | As required through the contractors CEMP |

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|      |                  |                | is a genuine extenuating circumstance and is required in order to prevent illegal parking of haulage vehicles that may have travelled a long distance. Waste that is accepted at the facility at or near closure time, will be unloaded at the appropriate waste reception area, stored overnight and processed during the next working day.   |  |
| MM13 | Nuisance Control | EIAR Chapter 2 | <p>A Complaints Register, detailing any and all complaints received from the general public in respect of the operation of the facility, will be maintained at the site.</p> <p>The following measures are currently and will continue to be employed at the site to control litter:</p> <ul style="list-style-type: none"> <li>• All waste entering the proposed development will be in covered vehicles. Bord na Móna will exclude any contractor failing to comply with this requirement from entering the site;</li> <li>• Waste processing associated with the composting activity will take place within fully enclosed buildings;</li> <li>• The approach roads to the proposed development site will be monitored on at least a daily basis and, in the event of litter being found on these roads, site staff will promptly remove it and deposit it in the appropriate manner at the facility;</li> <li>• General clean-up and attendance work will be carried out regularly by site staff around the entire perimeter of the overall facility footprint, on all internal access roads and on approach roads;</li> <li>• All waste will be deposited in a controlled manner in the landfill, offloaded into the compost building waste reception area or stored in the quarantine area. No waste will be stored, even temporarily, in any other undesignated area; and</li> <li>• All site areas will be inspected and cleaned regularly. Inspections of the wider bog area will also be carried out on occasion and any litter found will be collected and deposited within the landfill.</li> </ul> <p>A Vermin Control Plan has been developed by Bord na Móna as part of the Environmental Management Plan (EMP) for all of the company's waste management facilities. This Plan incorporates site specific measures for the existing facility and will be expanded upon to include infrastructure from the proposed development. This Plan will incorporate the following elements:</p> | As required through the contractors CEMP |



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|  |  |  | <ul style="list-style-type: none"> <li>• A site map showing the positions and numbers of each bait point;</li> <li>• A bait point monitoring routine with monthly inspection records for the facility filled up by the vermin control company and signed by the facility manager;</li> <li>• Inspection records for the bait points describing any signs of vermin and highlighting any vermin attractions on site;</li> <li>• Responsibility for the facility manager to act on the findings of the monthly inspection records; and</li> <li>• A vermin control manual containing the bait point location maps, product details/specifications for the baits used and the monthly inspection records.</li> </ul> <p>Records of vermin control will be kept on site for inspection by the EPA and/or KCC as required.</p> <p>A firm of professional vermin control experts will implement the Vermin Control Plan. Baiting will be undertaken in a professional manner and every precaution will be taken to avoid non-target species. In particular, bait will be placed in areas which are not accessible to non-target species and dead/dying vermin will be removed from site as soon as possible.</p> <p>The following measures are implemented at the existing facility and will continue to be implemented as part of the proposed development to eliminate or minimise nuisance odour emissions:</p> <ul style="list-style-type: none"> <li>• All aspects of the MSW processing and composting process will be undertaken in fully enclosed buildings;</li> <li>• All waste delivered to the proposed development will be in covered/enclosed vehicles. Similarly, all leachate being removed from the proposed development will be in enclosed tankers;</li> <li>• Access doors at the waste reception area of the MSW processing and compost building will be rapid closing doors, with an opening or closing time of approximately 20 seconds. Existing access points into the composting building will continue to be used;</li> <li>• The core composting process will be undertaken in fully enclosed concrete composting tunnels located within the enclosed building - thereby providing double containment features;</li> </ul> |  |
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|  |  |  | <ul style="list-style-type: none"> <li>• Air streams with a potential for high ammonia levels will be treated in an acid scrubber prior to biofiltration and release to atmosphere;</li> <li>• The existing odour management plan at the facility will be updated to incorporate the additional infrastructure. This plan will include management strategies for the prevention of emissions and a strict preventative maintenance and management program for ensuring that all odour mitigation techniques remain operational at optimal capacity throughout all operational scenarios;</li> <li>• The new odour abatement system at the compost building will be connected to the sites existing Supervisory Control and Data Acquisition (SCADA) system which allows for continuous monitoring of performance criteria. Should any parameter deviate outside of an accepted range, an alarm will be immediately generated. Critical alarms will be texted to selected mobile phones numbers thereby ensuring the communication of critical alarms to responsible individuals on a 24-hour basis;</li> <li>• Good housekeeping practices, such as clean working areas, dedicated storage areas and regular wash-down, (internally and externally) and a closed-door management strategy will be maintained at all times;</li> <li>• Biofilters will be compartmentalised to facilitate maintenance and replacement of media. Each biofilter will comprise of two sections such that treatment will be provided by one of the sections while the other section is being maintained;</li> <li>• Biofilters will be covered and thereby isolated from extreme weather conditions (e.g. intensive rainfall or intensive heat) thereby providing optimum control of biofilter efficacy; and</li> <li>• Treated air from the biofilters will be emitted through elevated vent stacks to facilitate appropriate residual odour dispersion.</li> </ul> <p>A number of fire risk control measures will be implemented at the proposed development. These include the following:</p> <ul style="list-style-type: none"> <li>• Control of incoming waste vehicles to ensure that no burning or smouldering loads enter the facility;</li> <li>• All site operatives and employees will be trained in fire prevention, control and emergency response procedures;</li> <li>• Emergency response contact numbers (Fire Service, Gardaí, Ambulance and other agencies) will be posted in prominent locations around the facility;</li> </ul> |  |
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|      |                   |                | <ul style="list-style-type: none"> <li>• Automatic communication of fire alarms to mobile phone numbers of assigned responsible individuals;</li> <li>• Fire extinguishers, smoke detectors and fire alarms will be provided in all facility buildings;</li> <li>• A water bowser will be available to deal with any small fires within the facility; and</li> <li>• Smoking will only be permitted at designated areas within the proposed development.</li> </ul> <p>Water for fire-fighting will be provided from the proposed surface water lagoons on the site with a back-up supply from the existing on-site borehole where required. A firewater ring main will be installed to distribute water for fire-fighting to the new landfill and maintenance building and fire hydrants will be installed.</p> <p>In the event of a fire at the proposed development, all firewater generated will be collected within the surface water drainage network and will pass into the surface water lagoons. The firewater will be contained in these lagoons for sampling and analysis prior to release to surface water. If the samples indicate contaminants in the water, tankers will be used to pump out the contaminated water and transfer to an off-site WWTP.</p> <p>There is an existing Fire Prevention and Response Plan in place at the facility (included in Appendix 2-7) which will be reviewed and updated to reflect the proposed development and requirements of a future revised IE Licence from the EPA.</p> |  |
| MM14 | Health and Safety | EIAR Chapter 2 | <p>Key health and safety risks at the proposed development relate to unauthorised access and trespassing into the facility. Site fencing will be installed as shown on Drawing No. 11290-2006 of Appendix 2-1 to prevent unauthorised access and to remove the risk of members of the public entering the landfill during operations and construction as well as at night. Warning signs will be placed along the fencing at regular intervals informing people of the active waste facility and the potential hazards associated with the facility. CCTV will also be installed at key locations to monitor the perimeter fencing and access gates.</p>  | As required through the contractors CEMP |

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|                                      |                          |                | <p>Workers and visitors to the site will all be required to undertake a site induction prior to leaving the administration building and will be provided with a <i>Health and Safety Handbook</i> by Bord na Móna outlining general advice for protection of health and safety as well as information specific to the Drehid WMF. Speed limit signs area erected at regular intervals along the private access road to remind drivers to keep below 50 km/h while driving into or out of the facility to reduce the risk of vehicle collisions on the access road.</p> <p>All operations carried out at the facility will be in accordance with the requirements of the <i>Safety, Health and Welfare at Work Act 2005</i> as amended and all implementing regulations. Construction works will be carried out in accordance with the requirements of the Act and the <i>Safety, Health and Welfare at Work (Construction) Regulations 2006 to 2008</i>.</p> <p>All visitors attending the facility are required to sign in at reception and are met by facility staff. No unauthorised persons are permitted to walk around the facility on their own. Access onto the active tipping face where heavy machinery is operating is limited to only essential persons and must be accompanied by Bord na Móna staff unless authorised for work purposes. Access for vehicles to the administration building car park is controlled from the weighbridge and CCTV cameras at the site entrance are also monitored from this location.</p> <p>Within the site, there are dedicated access routes for incoming and outgoing waste vehicles with signage and barriers erected to segregate vehicles from pedestrians.</p> <p>All buildings and site access will be locked during non-working hours. Machinery will be locked during non-working hours and parked within the confines of the proposed development site.</p> |  |
| MM15                                 | Environmental Monitoring | EIAR Chapter 2 | All environmental monitoring will be carried out in accordance with the requirements of Conditions set out in a revised IE Licence to be issued by the EPA for the facility.   | As required through the contractors CEMP |
| <b>Population &amp; Human Health</b> |                          |                |  |  |

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| MM16                | Health and Safety                        | EIAR Chapter 2 and 5   | The project will employ all of the latest and relevant guidelines and legislation (See CEMP in Appendix 2-4 5 in terms of health and safety for works at the proposed development. The required levels of safety will be maintained for all site visitors and staff. The proposed development site itself will not be open to the public for the duration of the project. Appropriate health and safety measures as described in the CEMP (Appendix 2-45) will be taken for all works areas in the interest of worker safety also. Should any public health advice be in place during the construction phase (such as the recent Covid-19 public restrictions) these will be implemented on site. | As required through the contractors CEMP   |
| <b>Biodiversity</b> |  |                        |   |  |
| MM17                | Appointment of Ecological Clerk of Works | EIAR Chapter 6         | A suitably qualified Ecological Clerk of works (ECoW) will be appointed by the Contractor. The ECoW will be experienced in the management of peatland habitats and will oversee all construction works and monitor any possible sources for impacts for the duration of the construction programme. The ECoW will guarantee the construction phase of the proposed development will be undertaken in strict agreement with the methods prescribed within the CEMP and will have the power to stop the works in case any activities/works are not compliant.   | A suitably qualified Ecological Clerk of works (ECoW) will be appointed by the Contractor. Also as required through the contractors CEMP |
| MM18                | Appointment of Ecological Clerk of Works | NIS and EIAR Chapter 6 | A suitably qualified Ecological Clerk of Works (ECoW) will be appointed by the Contractor. The ECoW will be present for the duration of the construction phase programme and will ensure that all mitigation measures outlined within this report are implemented during the proposed construction works.   | A suitably qualified Ecological Clerk of works (ECoW) will be appointed by the Contractor. Also as required through the contractors CEMP |
| MM19                | Mitigation robustness                    | NIS and EIAR Chapter 6 | A Construction Environmental Management Plan (CEMP) has already been prepared and is included within the Planning Application. All mitigation measures outlined within this NIS and within the Environmental Impact Assessment (EIA) Report have been incorporated within the CEMP. All of the information provided within the CEMP will be implemented in full by the appointed Contractor, and its finalisation by the Contractor will not affect the robustness and adequacy of the information presented and replied upon in the NIS.   | As required through the contractors CEMP with supervision of ECoW.   |

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| MM20 | Water quality                    | NIS and EIAR<br>Chapter 6 | <p>During the construction phase of the proposed development surface water quality measures will be installed and maintained in accordance with the following CIRIA guidance; '<i>Control of water pollution from construction sites</i>' (C532) (Masters-Williams et al., 2001), and '<i>Control of Water Pollution from Linear Construction Projects. Technical guidance</i>' (C648) (Murnane et al., 2006) and with regard to the IFI guidance '<i>Guidelines on the Protection Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters</i>' (IFI, 2016) to ensure the protection of watercourses located within and downstream of the proposed development site.</p>  | As required through the contractors CEMP |
| MM21 | Water Quality & Sediment Control | NIS and EIAR<br>Chapter 6 | <p>The following are measures which will be implemented by the appointed Contractor to minimise and avoid the effects of sedimentation during the proposed construction phase.</p> <ul style="list-style-type: none"> <li>• All construction works will be confined to within the proposed development site boundary. No works will be undertaken outside of this area.</li> <li>• Prior to any excavation works commencing, silt fences will be erected around water features (e.g. drainage ditches) to ensure sedimentation is prevented. A permeable fabric (Hy-Tex Terraston Premium silt fence, or similar) will be used instead of mesh. The silt fences will be positioned to allow an appropriate working area, but should not occur within areas prone to flood, or below the high-water mark. The silt fencing will be erected as per the manufacturer's guidelines, under the ECoW supervision and will be maintained until all ground disturbance has ceased and vegetation re-established. Once installed, the silt fence will be inspected regularly during construction and more frequently during heavy rainfall events. The ECoW will also be supervise the removal of the silt fences following the completion of the works.</li> <li>• Once sediment control measures have been installed all exiting drainage ditches within the proposed development site will be blocked and rerouted around the works area.</li> <li>• All drains within the proposed development site will be blocked prior to the construction works commencing. The drains will be blocked off using locally sourced subsoil materials which will cause water levels in the subsoils and peat along the drain trajectories to rise. The rising water levels in the drains and surrounding lands within the proposed</li> </ul> | As required through the contractors CEMP |



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|  |  |  | <p>development boundary will be controlled by installing overflow pipes at the opposite end of drains which will allow water to overflow from the blocked drains to the new drains being established as part of the TSB Decommissioning and Rehabilitation Plan. Drain blocks and overflows will be constructed at the outset of peat stripping works to ensure that drainage water is kept out of excavation areas.</p> <ul style="list-style-type: none"> <li>• The blocking of drains will ensure there is no hydrological connectivity between the proposed development site and the Cushaling River and the Mulgeeth Stream. The blocked drains will serve as check dams/silt dams, helping to settle out any suspended matter that may derive from the peat berms.</li> <li>• Blocking drains will raise water levels locally which will maintain groundwater levels higher and help to re-wet previously drained peat. As such, drain blocking will have a localised positive effect. Re-wetting is expected to reduce the leaching of ammonia and other chemical constituents (e.g. organic matter, dissolved organic carbon).</li> <li>• The water in blocked drains will naturally undergo attenuation processes (such as nitrification of ammonia). Attenuation processes will continue to act as the water flows north to Mulgeeth Stream and along the Blackwater (Longwood) River in the downstream direction.</li> <li>• All excavated peat will be stored within designated areas before being used for the construction of the berms within the proposed development. The stockpiles of peat will be covered by weighted plastic sheeting which will prevent any runoff. The berms will be seeded with peat tolerant grass and shrub plant species which will help compact the peat. In addition, the area of land located to the east of the berm located along the eastern perimeter will be vegetated and will act as a vegetative buffer.</li> <li>• The bulk excavation works will not be carried out during or following heavy rainfall (i.e. if there is a yellow weather warning in place or 5 mm in a 1-hour period). Excavations will be covered with tarp or similar material, during high rainfall to avoid the creation of surface water with high concentrations of suspended solids that would require dewatering.</li> </ul> |  |
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| MM22 | Water Quality & Pollution Control | NIS and EIAR Chapter 6 | <p>The following are measures which will be implemented by the pointed Contractor to minimise and avoid the effects of water pollution during the proposed construction phase.</p> <ul style="list-style-type: none"> <li>• The construction compound will be located within the proposed development, adjacent to the new landfill (refer to Figure 3-1) which is set back from any water bodies.</li> <li>• Bord na Móna has existing Emergency &amp; Response and Spill Clean Up plans which will be referred to and implemented during the construction phase of the proposed development to deal with accidental spillages.</li> <li>• Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of all construction vehicles. All machine operators and site staff will be fully trained in the use of this equipment.</li> <li>• All machinery will be regularly maintained and checked for leaks. Services will only be undertaken within the construction compound or offsite.</li> <li>• Refuelling will only occur within the construction compound under inspection by the ECoW or off-site away from the proposed development site. Re-fuelling onsite of construction equipment and the addition of hydraulic oil or lubricants to vehicles / equipment will take place in designated hard surface, bunded areas within the construction compound. If it is not possible to bring machinery to the refuelling point, fuel will be delivered in a double-skinned mobile fuel bowser. A drip tray will be used beneath the fill point during refuelling operations in order to contain any spillages that may occur.</li> <li>• All concrete will be mixed off site and will be brought in as required and poured in place at site. No on-site batching will be permitted within the proposed development site.</li> <li>• All concrete browsers will be washed down at a dedicated concrete washout area located within the construction compound or off site at a licensed facility. No chemicals that are deleterious to aquatic organisms will be used in cleaning works. All raw, uncured waste concrete will be cured at a designated location within the construction compound or off site.</li> <li>• All concrete works will be scheduled during dry weather conditions only to reduce the elevated risk of runoff.</li> </ul> | As required through the contractors CEMP |
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|      |                          |                        | <ul style="list-style-type: none"> <li>• All waste will be removed from the site and disposed of by an approved waste contractor in accordance with prevailing waste management regulations.</li> <li>• On completion of the works, all apparatus, plant, tools, offices, sheds, surplus materials, rubbish and temporary erections or works of any kind will be removed from the site.</li> <li>• Water intercepted from constructed roads and hardstanding areas will be similarly managed to ensure that uncontrolled water discharges do not take place to the receiving environment.</li> <li>• Stormwater will be diverted through a sediment grit trap and oil interceptor, prior to discharge to the existing attenuation ponds and ICW.</li> <li>• The existing wheelwash within the proposed development site will be used during the construction phase. Upon replenishment, the dirty water from the wheelwash will be discharged into the existing foul drainage network and transferred to the wastewater storage tank for blending with landfill leachate and removal off-site.</li> </ul>  |  |
| MM23 | Surface Water Monitoring | NIS and EIAR Chapter 6 | <ul style="list-style-type: none"> <li>• During the construction phase, surface water quality monitoring will be undertaken within drains near the construction activity and within the Cushaling River. Monitoring will be undertaken at existing monitoring points located at SW5 and SW6 and monitoring will be undertaken at the outflow of the new ICW and will be called SW9.</li> <li>• In addition, water quality will also be monitored within the Mulgeeth Stream at SW10 where the watercourse exit the Bord a Móna landholding, during the construction phase.</li> <li>• All surface water sampling will be carried out by trained personnel from Bord na Móna or by suitably qualified consultants. All analyses, except for on-site readings, will be carried out off-site by an accredited laboratory. A visual inspection of all surface water streams on and adjacent to the proposed development will be carried out by site personnel on a weekly basis.</li> <li>• The parameters; pH, specific electrical conductivity (SEC), dissolved oxygen (DO), temperature, and turbidity will be measured in the field, daily at each location, with the use of hand-held, calibrated water quality instruments. Suspended solids, pH, temperature and total ammonia will be sampled weekly for laboratory analyses:</li> </ul> | As required through the contractors CEMP |

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|      |                             |                        | <ul style="list-style-type: none"> <li>○ 'Before' sampling will begin 4 weeks prior to activity commencing, in wet weather conditions.</li> <li>○ "During" sampling will occur during or immediately following rainfall events.</li> <li>○ The 'after' sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (where an effect has been shown). The sampling will be limited to flowing waters.</li> </ul>   |  |
| MM24 | Ground Water Monitoring     | NIS and EIAR Chapter 6 | <ul style="list-style-type: none"> <li>• Ingress of groundwater may occur within some excavated areas. All ingress of groundwater will be over pumped using a sump pump to the existing perimeter swale and attenuation lagoons that are associated with the WMF. Based on practical experiences from the construction of the existing WMF, the quantities of water that will need to be managed (pumped out) are expected to be generally less than 5 m<sup>3</sup>/h (0.0013 m<sup>3</sup>/s, or 1.3 l/s), although shorter term pumping can be higher, especially after significant rainfall events. The discharge water from the sumps will be directed to the attenuation lagoons and ICW.</li> <li>• Existing groundwater wells will be monitored during construction works to determine the influence of any dewatering required for construction of the new landfill. All groundwater monitoring will be carried out by trained personnel in accordance with best practice sampling guidance. Samples will be collected and sent off-site to accredited laboratories for analysis.</li> </ul> | As required through the contractors CEMP |
| MM25 | Invasive Species Management | NIS and EIAR Chapter 6 | <p>In order to comply with Regulations 49 and 50 of the European Communities (Birds and Natural Habitat) Regulations (2011), the appointed Contractor will ensure biosecurity measures are implemented throughout the construction phase to ensure the introduction and translocation of invasive species is prevented.</p> <p>In the event that proposed construction works are delayed more than 18 months, a pre-construction invasive species survey will be undertaken as recommended within the CIEEM Advice Note (CIEEM, 2019).</p> <p>The following mitigation measures are prescribed in line with Transport Infrastructure Ireland Guidance (TII, 2020) and IFI Guidance (IFI, 2010) to control the translocation or spread of invasive species and / or pathogens:</p>   | As required through the contractors CEMP |

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|      |                                  |                | <ul style="list-style-type: none"> <li>• No invasive plant species were recorded within the proposed development. However, in the event that proposed construction works are delayed more than 18 months, a pre-construction invasive species survey will be undertaken as recommended within the CIEEM Advice Note (CIEEM, 2019). In the event that an invasive plant species, listed in Part 1 of the Third Schedule of S.I No. 477/2011 – European Communities (Birds and Natural Habitats) Regulations 2011 is recorded a site-specific Invasive Species Management Plan (ISMP) will be prepared.</li> <li>• Prior to arrival all machinery and equipment used during the construction works will be thoroughly cleaned and then dried using a high-pressured steam cleaning, with water &gt;65 °C, in addition to the removal of all vegetation material. Disinfectant, such as a Virkon® Aquatic solution, will be used. The appointed Contractor will establish and clearly delineate a bunded cleaning/washing area.</li> <li>• No removed material or run-off will be allowed to enter any water bodies (e.g. drainage ditches).</li> <li>• Evidence that all machinery and equipment has been cleaned will be required to be on file for review by the statutory authorities and the appointed ECoW.</li> </ul> |  |
| MM26 | Management of Habitats and Flora | EIAR Chapter 6 | <p>Where required, vegetation clearance will be kept to a minimum. The proposed construction work areas will be demarcated prior to the construction works commencing. No clearance of vegetation will be undertaken outside of the demarcated areas within the proposed development site. Construction vehicles will be restricted to designated areas access tracks to avoid impacting adjacent habitats and to ensure that soil compaction is restricted to these tracks. All disturbed ground will be fully reinstated following the completion of the works.</p> <p>Bog mats will be used mitigating rutting and reducing soil erosion and impact to bog habitat. Bog mats replacement will be enforced when they become heavily used and worn. In addition, machinery used will have wide tracks suitable to be used over areas of soft bog</p>   | As required through the contractors CEMP |

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| MM27 | Replanting of New Vegetation | EIAR Chapter 6 | The development of the ICW within the proposed development site will provide a new wetland feature which will be beneficial to invertebrate, amphibians and a range of breeding and wintering waterfowl species. The ICW will be approximately 5.61 ha in size and include a range of locally sourced and native wetland emergent species such as greater pond sedge ( <i>Carex riparia</i> ), reed sweet-grass ( <i>Glyceria maxima</i> ), bulrush ( <i>Typha latifolia</i> ), common clubrush ( <i>Schoenoplectus lacustris</i> ) and yellow flag iris ( <i>Iris pseudacorus</i> ). In addition, native trees and shrubs such as alder buckthorn ( <i>Frangula alnus</i> ), willow, alder and birch will also be planted around the ICW where suitable ground conditions can be achieved, covering an area of approximately 2.15 ha. | As required through the contractors CEMP |
| MM28 | Replanting of New Vegetation | EIAR Chapter 6 | The capping layer of the landfill will be planted with grass and shrub species, as each section is completed providing a total of 35.75 ha of new habitat. The use of "Green hay", which will be locally sourced, will be used to support reseeding the landfill capping. This will be done in addition to the use of an initial "nurse crop" that will initially revegetate the new soil. Primarily, native Irish species red fescue ( <i>Festuca rubra</i> ) and Common bent-grass ( <i>Agrostis stolonifera</i> ) will be used. This enhancement measure will aid in the recolonisation of suitable habitat for lepidoptera species.  | As required through the contractors CEMP |
| MM29 | Replanting of New Vegetation | EIAR Chapter 6 | 5 m high berms enclosing the development from the north, east and west will be planted with bands of locally sourced native peatland tolerant grass and shrub species. The remaining areas of the berm will be left to naturally revegetate over time. The vegetating of these areas will not only provide new habitats, but will also compact the peat, reducing runoff of suspended solids.<br><br>The land located to the east of the eastern berms will be vegetated with peat tolerant grass and shrub species and will cover an area of 16.46 ha. This area of vegetation will also create a natural vegetative buffer between the berms and the drainage ditch, again reducing runoff.  | As required through the contractors CEMP |
| MM30 | Replanting of New Vegetation | EIAR Chapter 6 | The lands located to the south of the proposed landfill site will benefit from the blocking of drains on the eastern boundary of the site and will likely re-wet overtime. Blocking drains will raise water levels locally which will maintain groundwater levels higher and help to re-wet previously drained peat. As such, drain blocking will have a localised positive effect. Re-wetting is expected to  | As required through the contractors CEMP |

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|      |                                |               | <p>reduce the leaching of ammonia and other chemical constituents (e.g. organic matter, dissolved organic carbon).</p> <p>The regeneration of new habitats within this area (lands located to the south of the landfill and east of the eastern berm) will be encouraged firstly by reducing all disturbance within the area and allowing natural colonization, and through the creation of new habitats such as fens, reed swamps, heath embryonic sphagnum-rich peat forming communities and wet and birch woodland communities, where conditions are suitable.</p> <p>The total area of new planting will be approximately 72.57 ha. All area of replanting are shown in the Landscape Management Plan in Appendix 2-1 of this EIA. Further details on the replanting and creation of new habitats is detailed in the Habitat Management and Enhancement (HME) Plan included in Appendix 6-3 of this EIA.</p>   |  |
| MM32 | Protection of Aquatic Habitats | EIA Chapter 6 | <p>All mitigation measures associated with sediment and pollution control outlined in Chapter 8 of the EIA - Water will be implemented, which will ensure the protection of aquatic species present within the Cushaling River and further downstream.</p> <p>A summary of mitigation measure proposed are outlined hereunder:</p> <ul style="list-style-type: none"> <li>• All drains within the proposed development site will be blocked prior to the construction works commencing. The drains will be blocked off using locally sourced subsoil materials which will cause water levels in the subsoils and peat along the drain trajectories to rise. The rising water levels in the drains and surrounding lands within the proposed development boundary will be controlled by installing overflow pipes at the opposite end of drains which will allow water to overflow from the blocked drains to the new drains being established as part of the TSB Decommissioning and Rehabilitation Plan. Drain blocks and overflows will be constructed at the outset of peat stripping works to ensure that drainage water is kept out of excavation areas.</li> <li>• The blocked drains will serve as check dams/silt dams, helping to settle out any suspended matter that may derive from the peat berms.</li> <li>• No instream works or water abstraction will be undertaken within/from the Cushaling River.</li> </ul> | As required through the contractors CEMP |



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|      |                                     |                | <ul style="list-style-type: none"> <li>Silt fences will be erected along the southern boundary of the proposed development site and around stock piles of material.</li> <li>Prior to the commencement of excavations, an area for stockpiling the excavated material will be identified within the proposed development site, at minimum of 50 m from the Cushaling River, or any drainage ditch.</li> <li>Excavation works will not be carried out during or following heavy rainfall (i.e. if there is a yellow weather warning in place or 5 mm in a 1-hour period).</li> <li>An emergency plan for the construction phase of the proposed development to deal with accidental spillages will be drawn up, which all site personnel must adhere to and receive training.</li> </ul> |  |
| MM33 | Protection of Nesting Birds         | EIAR Chapter 6 | Breeding bird habitats will not be removed, cleared or trimmed between the 1st March and 31st August, inclusive, to avoid impacts on nesting birds protected under the Irish Wildlife Acts. In the unforeseen circumstances where the construction programme does not allow this time restriction to be observed, then these areas will be inspected by a qualified ecologist for the presence of breeding birds prior to commencement of construction works. Where any nests are found, the appointed ECoW will provide recommendations as to whether a licence is required for vegetation removal and will detail the process for obtaining such derogation licence from the NPWS.  | As required through the contractors CEMP |
| MM34 | Protection of Aquatic Species       | EIAR Chapter 6 | No non-native fish species will be brought to, or released, within any water feature within the proposed development site, during the construction, operation and decommissioning phases.   | As required through the contractors CEMP |
| MM35 | Disturbance / Displacement Measures | EIAR Chapter 6 | Construction noise will be kept to a minimum in accordance with British Standard BS 5228 1:2009 'Code of Practice for Noise and Vibration Control on Construction and Open Sites -Part 1: Noise'. The appointed Contractor will be obliged to take specific noise abatement measures and will comply with the best practice outlined in BS 5228 and the NRA guidelines <i>Good practice Guideline for the Treatment of Noise during the Planning of National Road Schemes</i> (NRA, 2014). Noise levels will be monitored using standard noise meters.  | As required through the contractors CEMP |

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|   |   |                | To reduce disturbance, all temporary lighting associated with the construction works will be placed strategically by the appointed Contractor following consultation with the appointed ECoW. This will ensure that illumination beyond the works area is controlled. Lighting will be cowed and directional to reduce significant light splay.  |  |
| MM36                                    | Protection of Lepidoptera Species             | EIAR Chapter 6 | <p>The HME Plan (Appendix 6-3 of the EIAR) outlines measures that will be implemented to protect and enhance suitable lepidoptera habitats present within the proposed development site.</p> <p>Construction phase mitigation measures are summarised below:</p> <ul style="list-style-type: none"> <li>• The works area will be clearly defined and fenced off in advance of construction activities;</li> <li>• Vegetation clearance will be carried out in phases;</li> <li>• Natural recolonisation will be used for spoil stabilization; and</li> <li>• Sub-peat material/mineral soils will be stored separately from the peat materials that will be used for capping.</li> </ul> | As required through the contractors CEMP |
| <b>Soils Geology &amp; Hydrogeology</b> |   |                |  |  |
| MM37                                    | Clear-Brushing, Peat Stripping and Earthworks | EIAR Chapter 7 | <p>To reduce the further loss of residual peat, the landfill footprint and defined works areas have been minimized in the design to the extent possible.</p> <p>The excavated peat (up to 3.5 m thick based on Section 7.4.2 of this EIAR) and underlying sediments will be reused within the Proposed Development area.</p>   | As required through the contractors CEMP |
| MM38                                    | Modification to Drainage Network              | EIAR Chapter 7 | <p>Some effects are inevitable, as the modifications to the drainage work are necessary to be able to construct the expanded landfill.</p> <p>Modifications to the drainage network were minimised during drainage design by BnM's engineering team, and bog drains will be kept as shallow as practicable to reduce the interception potential of shallow groundwater. The trajectories and depths of individual drains also consider practicalities and costs of construction.</p>   | As required through the contractors CEMP |

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| MM39 | Stormwater Runoff and Groundwater Recharge                | EIAR Chapter 7 | Stormwater management for the Proposed Development as a whole is described in Chapter 2 of this EIAR and Appendix 2-3. This includes measures that are based on principles of sustainable urban drainage systems (SUDS), which aim to reduce the quantities of stormwater generated by developments in order to maintain natural processes, including recharge, to the extent possible.  | As required through the contractors CEMP |
| MM40 | Seepage and Pumping of Water From Open Excavations / Pits | EIAR Chapter 7 | <p>Individual waste cells will be 268 m long and 97 m wide. During construction, sections of cells are opened sequentially with installations progressing across the cell in a sequenced manner. This process simplifies construction and water management. Based on procedures that are followed at the existing WMF, a shallow drain is dug around the area inside a cell that is under construction. This is a temporary measure to accommodate the installation of infrastructure (under-cell drainage system, sumps, liner) and facilitate the periodic pumping from open excavations.</p> <p>Existing drains that presently cross the landfill footprint will be blocked off as a first step. While this will cause a rise in groundwater levels in subsoils and peat along drain trajectories outside the landfill footprint, this will also prevent ingress of water directly from the drains into the excavations. This is a permanent measure.</p> | As required through the contractors CEMP |
| MM41 | Accidental Spills and Leaks                               | EIAR Chapter 7 | <p>The prevention of, and response to, accidental spills and leaks of fuel and other chemicals during construction are covered by the Construction and Environmental Monitoring Plan (Appendix 2-5 to the EIAR). The following mitigation measures will be implemented:</p> <ul style="list-style-type: none"> <li>• Onsite refuelling will be carried out at dedicated locations by trained personnel only.</li> <li>• Onsite refuelling of machinery will be done by mobile double-skinned fuel bowzers.</li> <li>• Drip trays and fuel absorbent mats will be available and used during all refuelling operations</li> <li>• A permit for the fuel system will be put in place.</li> <li>• Fuel storage tanks will be bunded, self-contained and double-walled, conforming with EPA bunding specifications.</li> </ul>  | As required through the contractors CEMP |

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|      |                                   |                | <ul style="list-style-type: none"> <li>• The fuel-filling area will be fitted with a storm drainage system and an appropriate oil interceptor.</li> <li>• The plant used during construction will be regularly inspected for leaks and fitness for purpose.</li> <li>• Spill kits will be available to deal with and accidental spillages in and outside the re-fuelling area.</li> </ul>   |  |
| MM42 | Releases of Cement-Based Products | EIAR Chapter 7 | <p>Batching of cement will be carried out at dedicated, existing locations within the WMF. Chute cleaning water will be undertaken at lined cement washout ponds, using the smallest volume of water practicable. Containment will be facilitated with straw bales. Ponds will be lined with an impermeable membrane. Ponds will also be covered when not in use to prevent rainwater collecting. Pour sites of cement will be kept free of standing water, and plastic covers will be ready in case of sudden rainfall events.</p> <p>Risks of pollution will be further reduced as follows:</p> <ul style="list-style-type: none"> <li>• Concrete will not be transported around the site in open trailers or dumpers so as to avoid spillage while in transport.</li> <li>• All concrete used in the construction will be pumped directly into the shuttered formwork from the delivery truck. If this is not practical, the concrete will be pumped from the delivery truck into a hydraulic concrete pump or into the bucket of an excavator, which will transfer the concrete locally to the location where it is needed.</li> <li>• Arrangements for concrete deliveries will be discussed with operators before work starts, confirming routes, prohibiting onsite washout and discussing emergency procedures.</li> <li>• Clearly visible signage will be placed in prominent locations close to concrete pour areas specifically stating washout of concrete lorries is not permitted on the site.</li> <li>• Using weather forecasting to assist in planning large concrete pours and avoiding large pours where prolonged periods of heavy rain is forecast.</li> <li>• Restricting concrete pumps and machine buckets from slewing over watercourses while placing concrete.</li> <li>• Ensuring that covers are available for freshly placed concrete to avoid the surface washing away in heavy rain.</li> </ul> | As required through the contractors CEMP |

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|              |                       |                | <ul style="list-style-type: none"> <li>Disposing of any potential, small surplus of concrete after completion of a pour in suitable locations away from any watercourse or sensitive habitats.</li> </ul> <p>The duration of the applicability of mitigation measures covers the entire construction period.</p>   |  |
| MM43         | Wastewater Management | EIAR Chapter 7 | <p>As described in Chapter 2 of the EIAR, the Proposed Development includes a dedicated contractor's compound where welfare facilities for staff in the form of portacabins will be established for the duration of construction works and removed by the Contractor at the end of each construction contract.</p> <p>Separate welfare facilities are already in place for operational staff in the existing WMF administration building and additional welfare facilities are being constructed for operational staff in the new MSW Processing and Composting Facility as well as in the new Maintenance Building.</p> <p>As such, wastewater will not be treated or disposed of within the Proposed Development areas. Associated wastewater will be collected regularly and brought offsite in fully enclosed tanks for disposal by authorised means (permitted wastewater collector) to a wastewater treatment plant.</p> | As required through the contractors CEMP |
| <b>Water</b> |                       |                |  |  |
| MM44         | Water Protection      | EIAR Chapter 8 | <p>The principal objectives of proposed mitigation measures are:</p> <ul style="list-style-type: none"> <li>To control water discharges.</li> <li>To limit chemical and sediment loading to receiving surface water bodies.</li> <li>To prevent accidental spill and leaks from occurring.</li> </ul>  | As required through the contractors CEMP |
| MM45         | Vegetation Removal    | EIAR Chapter 8 | <p>Mitigation measures and routine best practice methods are incorporated in the CEMP (Appendix 2-5), consistent with:</p> <ul style="list-style-type: none"> <li>Forestry Commission (2004): Forests and Water Guidelines, Fourth Edition. Publ. Forestry Commission, Edinburgh.</li> <li>Coillte (2009): Forest Operations and Water Protection Guidelines.</li> <li>Coillte (2009): Methodology for Clear Felling Harvesting Operations (Draft); Forest Service.</li> </ul>   | As required through the contractors CEMP |

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|      |                    |                | <ul style="list-style-type: none"> <li>Forest Service (2000): Forestry and Water Quality Guidelines. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford.</li> </ul> <p>Vegetation stripping and clear-brushing will be avoided during the birds nesting season (per the Wildlife Act: March 1<sup>st</sup> - August 31<sup>st</sup>) and during significant rainfall events.</p>   |  |
| MM46 | Vegetation Removal | EIAR Chapter 8 | <p>Machine combinations (i.e. handheld or mechanical) will be chosen which are most suitable for ground conditions in order to minimise the disturbance of peat/soils. Mechanical machinery will have wide tracks suitable for the soft bog/soil environment. BnM has considerable experience in the operation of plant and machinery in peat environments and will ensure that these initial development works are only carried out by experienced operators with suitable machinery.</p> <p>Vehicles will use road infrastructure and designated drain culverts/crossing points in all works areas. Tracking of vehicles across/through/along watercourses will not occur. Checks and maintenance of roads and culverts will be ongoing throughout the activity periods.</p> <p>Silt fences/traps will be placed downgradient of work areas near and along drains. The purpose is to allow the settling of silt and limiting sediment transport into and via drains. Any accumulated sediments will be excavated based on visual inspection.</p> <p>Bog mats will be used to support vehicles on soft ground, thereby mitigating rutting and reducing soil erosion. Bog mats replacement will be enforced when they become heavily used and worn. Loose sediments will be compacted or removed from tracks during wet periods and dust suppression will be employed during dry spells. Vehicles leaving works areas and going onto the access or public roads will pass through a wheel wash. Controlled, accumulated sediments will be carefully disposed in dedicated disposal areas away from drains.</p> <p>Drains and silt fences/traps will be maintained throughout the activity periods, and will be kept clear of sediment build-up.</p> | As required through the contractors CEMP |

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|      |                    |                | Brush materials, including roots, will be stacked in dedicated dry areas. Straw bales will be emplaced on the downgradient side of such areas. Branches, logs or debris will not be allowed to build up in aquatic zones.  |  |
| MM47 | Vegetation Removal | EIAR Chapter 8 | <p>Prior to activity, operational rules will be communicated with the contractor/operator. Activities will be supervised on a full-time basis. Equipment, machinery, access roads and culverts will be inspected daily.</p> <p>Following activity, all drains will be inspected to ensure that they are functioning as intended, including those which are part of the TSB Decommissioning and Rehabilitation Plan (BnM, 2022). Any accumulated silts will be removed. Removed materials will be deposited in dedicated disposal areas, away and separated from drains. Disposal will not result in sediment mobilisation towards any stream leaving the landholding.</p>  | As required through the contractors CEMP |
| MM48 | Vegetation Removal | EIAR Chapter 8 | During the construction phases, monitoring campaigns will be undertaken as presented in Section 8.4.19 of the EIAR.  | As required through the contractors CEMP |
| MM49 | Earthworks         | EIAR Chapter 8 | <p>Risks and effects of earthworks are made greater during storm events. Hence, earthworks will not be carried out during significant storm events. Decisions to potentially suspend works will be made from visual observation and weather forecasting of storm events. The checking and communication of weather forecasts are part of the CEMP. The following forecasting systems are available:</p> <ul style="list-style-type: none"> <li>• General Forecasts: Available on a national, regional and county level from Met Eireann. These provide general information on weather patterns including rainfall, but do not provide any quantitative rainfall estimates.</li> <li>• MeteoAlarm: This service alerts to the possible occurrence of severe weather for the next 2 days at provincial scale.</li> <li>• 3-hour Rainfall Maps: These forecast quantitative rainfall amounts for the next 3 hours but do not account for possible high-intensity localised events.</li> <li>• Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (<a href="http://www.met.ie/latest/rainfall_radar.asp">www.met.ie/latest/rainfall_radar.asp</a>). The images are a composite of radar data from Shannon and Dublin airports and provide a picture of</li> </ul> | As required through the contractors CEMP |



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|      |            |                | <p>current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive.</p> <ul style="list-style-type: none"> <li>• Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest.</li> </ul> <p>Prior to suspending works for climatic reasons, the following control measures will be completed:</p> <ul style="list-style-type: none"> <li>• Open excavations will be secured.</li> <li>• Temporary or emergency drainage will be provided to prevent back-up of surface runoff in work areas.</li> </ul> <p>Working for up to 24 hours after heavy rainfall events will be avoided to ensure drainage systems are not overloaded. Decisions are subject to visual inspection and judgement by the resident (supervising) engineer. The intent and objective is to control erosion, avoid collapses of embankments, and limit the mobilisation and transport of sediments.</p>  |  |
| MM50 | Earthworks | EIAR Chapter 8 | <p>Proposed mitigation measures fall into three basic categories:</p> <ul style="list-style-type: none"> <li>• <u>Source controls</u>, involving the use of swales, silt fences, straw bales, flume pipes, sand bags, oyster bags (e.g. filled with gravel), and filter fabrics. Flexibility to adapt methods will be required based on location-specific conditions, as judged by supervising engineers.</li> <li>• <u>In-Line controls</u>, involving the use of silt fences, straw bales, check/silt dams and flume pipes.</li> <li>• <u>Treatment systems</u>, involve the use sediment traps and attenuation lagoons.</li> </ul> <p>Swales will surround the works and staging areas. Runoff and drainage water collected in the swales will initially be directed to the existing perimeter swale that surrounds the WMF. From here, the collected water will be routed to the existing attenuation ponds and ICW system south of the WMF. Directing the water to in this manner will require pumping from collector sumps which will be placed at suitable locations in active works and staging areas. The water pumped from the sumps will be led to the perimeter swale using temporary pipes.</p> | As required through the contractors CEMP |

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|      |                                  |                | <p>In addition to the source and in-line control measures, the water will be treated through the existing attenuation lagoons and ICW system. Once the proposed, new attenuation lagoons and ICW system are constructed, the water will pass through this system, reducing the distance of the sump pumping involved.</p> <p>Trapped sediments in source, in-line and treatment controls, including swales and drains will be periodically removed based on regular inspection. Drains will also be maintained so as not to overflow during the construction stages. Outflows from blocked drains (see Section 8.5.2.3 of the EIAR) will be controlled by 8-inch pipes at the downstream ends of each blocked drain.</p>  |   |
| MM51 | Earthworks                       | EIAR Chapter 8 | <p>Monitoring will be performed according to the Section 8.5.2.1 of the EIAR. In addition, regular (min. daily) inspections of drainage systems will be undertaken, especially during rainfall events, to check for damage and blockages, and ensure there is no escape or build-up of standing water in parts of the systems where it is not intended. Any excess build-up of sediment in the drainage system will be removed in a controlled and supervised manner using excavators, as outlined in the CEMP.</p>   | As required through the contractors CEMP. |
| MM52 | Modification to Drainage Network | EIAR Chapter 8 | <p>The proposed drain blocks outside the landfill expansion footprint will contribute to raising water levels in and surrounding the blocked drains. The raising of water levels is expected to reduce the leaching potential of ammonia and mobilisation of suspended matter east of the landfill expansion footprint.</p> <p>The flat areas between the peat berms and actively flowing drains (e.g., the new south-to-north drain) will be purposefully vegetated to create buffer zones, whereby the aim is to attenuate ammonia and suspended matter loads.</p> <p>The drain blocks will also serve as check dams for suspended solids (including organic matter). The water in the blocked drains will undergo natural attenuation processes (including nitrification), and such processes will continue in the downstream direction within TSB, Mulgeeth Stream and along the Blackwater (Longwood) River.</p> <p>Bog drainage water which passes to the Cushaling River will continue to flow through the old settlement ponds near the western BnM landholding boundary.</p> | As required through the contractors CEMP  |

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|      |   |                   | Bog drainage water which passes to the Mulgeeth Stream will pass through a new settling pond to be built on the main drain within TSB, before the exit point of TSB, as per PCAS/TSB Decommissioning and Rehabilitation Plan.   |   |
| MM53 | Pumping/<br>Dewatering of<br>open<br>Excavations/<br>Pits | EIAR Chapter<br>8 | <p>Following water management procedures in the existing WMF, a perimeter drain will be dug around the phase that is under construction as a means of helping to control water levels in the excavations. This limits the quantity of water collecting in excavation floors.</p> <p>Existing drains that presently cross the landfill footprint will also be blocked off. This will raise water levels in subsoils and peat along the drain trajectories, external to the landfill footprint, but will also prevent ingress of water from the drains into the excavations.</p>  | As required through the contractors CEMP. |
| MM54 | Pumping/<br>Dewatering of<br>open<br>Excavations/<br>Pits | EIAR Chapter<br>8 | The water pumped by sump pumps will also pass through silt bags before being discharged into swales. As the water pass through the silt bags, the majority of sediment and organic matter is retained by geotextile fabric. The silt bags will be used with natural vegetation filters or sedimats. Sediment entrapment mats, consisting of coir or jute matting, will be placed at the silt bag locations to provide further treatment of the outfalls from silt bags. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure that all water passes through this additional treatment measure. Level spreaders will be designed for each outfall. As outlined in the CEMP (Appendix 2-5), these are standard practice methods which help to reduce suspended matter loads. | As required through the contractors CEMP  |
| MM55 | Pumping/<br>Dewatering of<br>open<br>Excavations/<br>Pits | EIAR Chapter<br>8 | Surface water will be monitored as described in Section 8.4.19 and 8.4.20 of the EIAR.  | As required through the contractors CEMP  |
| MM56 | Accidental Spills<br>and Leaks of<br>Chemicals            | EIAR Chapter<br>8 | <p>The prevention of, and responses to, accidental spills and leaks of fuel and other chemicals are covered by the CEMP. The following mitigation measures will be implemented:</p> <ul style="list-style-type: none"> <li>Onsite refuelling will be carried out at dedicated locations by trained personnel only.</li> </ul>   | As required through the contractors CEMP  |

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|      |                                    |                | <ul style="list-style-type: none"> <li>• Onsite refuelling of machinery will be done by mobile double-skinned fuel bowzers.</li> <li>• Drip trays and fuel absorbent mats will be available and used during all refuelling operations.</li> <li>• A permit for the fuel system will be put in place.</li> <li>• Fuel storage tanks will be bunded, self-contained and double-walled, conforming with EPA bunding specifications.</li> <li>• The fuel-filling area will be fitted with a storm drainage system and an appropriate oil interceptor.</li> <li>• The plant used during construction will be regularly inspected for leaks and fitness for purpose.</li> <li>• Spill kits will be available to deal with and accidental spillages in and outside the re-fuelling area.</li> </ul>   |  |
| MM57 | Releases of Cement- Based Products | EIAR Chapter 8 | Concrete will be delivered where it is needed in sealed concrete delivery trucks. Ready-mixed supply of wet concrete products such as pre-cast elements for culverts will be installed. Concrete trucks will be directed back to their batching locations for washout. As stated in the CEMP, discharge of cement-based products to construction phase drainage systems or directly to any artificial drain or other watercourse will not be allowed. Pre-cast elements for culverts will be used.   | As required through the contractors CEMP |
| MM58 | Releases of Cement- Based Products | EIAR Chapter 8 | <p>Batching of cement will be carried out at dedicated, existing locations within the WMF. Chute cleaning water will be undertaken at lined cement washout ponds. Containment will be facilitated with straw bales. Ponds will be lined with an impermeable membrane. Ponds will also be covered when not in use to prevent rainwater collecting. Pour sites of cement will be kept free of standing water, and plastic covers will be ready in case of sudden rainfall events.</p> <p>Risks of pollution will be further reduced as follows:</p> <ul style="list-style-type: none"> <li>• Concrete will not be transported around the site in open trailers or dumpers so as to avoid spillage while in transport.</li> <li>• All concrete used in the construction will be pumped directly into the shuttered formwork from the delivery truck. If this is not practical, the concrete will be pumped from the delivery truck into a hydraulic concrete</li> </ul> | As required through the contractors CEMP |

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|      |                       |                | <p>pump or into the bucket of an excavator, which will transfer the concrete locally to the location where it is needed.</p> <ul style="list-style-type: none"> <li>• Arrangements for concrete deliveries will be discussed with operators before work starts, confirming routes, prohibiting onsite washout and discussing emergency procedures.</li> <li>• Clearly visible signage will be placed in prominent locations close to concrete pour areas specifically stating washout of concrete lorries is not permitted on the site.</li> <li>• Using weather forecasting to assist in planning large concrete pours and avoiding large pours where prolonged periods of heavy rain is forecast.</li> <li>• Restricting concrete pumps and machine buckets from slewing over watercourses while placing concrete.</li> <li>• Ensuring that covers are available for freshly placed concrete to avoid the surface washing away in heavy rain.</li> <li>• Disposing of any potential, small surplus of concrete after completion of a pour in suitable locations away from any watercourse or sensitive habitats.</li> </ul> |  |
| MM59 | Wastewater Management | EIAR Chapter 8 | <p>The Proposed Development includes a dedicated contractor's compound where welfare facilities for staff in the form of portacabins will be established for the duration of construction works and removed by the Contractor at the end of each construction contract.</p> <p>Separate welfare facilities are already in place for operational staff in the existing WMF administration building and additional welfare facilities are being constructed for operational staff in the new MSW Processing and Composting Facility as well as in the new Maintenance Building.</p> <p>As such, wastewater will not be treated or disposed of within the Proposed Development areas. Associated wastewater will be collected regularly and brought offsite in fully enclosed tanks for disposal by authorised means (permitted wastewater collector) to a wastewater treatment plant.</p> <p>The use of sealed storage tanks and offsite disposal breaks the link between the source and receptor.</p>  | As required through the contractors CEMP |

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| MM60                   | WFD Status of Surface Water Bodies | EIAR Chapter 8 | Strict control measures will be put in place, as presented in Section 8.4.21 and Sections 8.5.2.1 through 8.5.2.7 of the EIAR. Construction-related waters will pass through swales, sumps, check dams, attenuation lagoons and ICW systems in all stages of development. Existing data associated with the existing attenuation lagoons and ICW system at the WMF shows that ammonia and suspended solids concentrations are significantly reduced (attenuated) by the system, with discharge values that are consistently below ELVs.  | As required through the contractors CEMP |
| MM61                   | WFD Status of Surface Water Bodies | EIAR Chapter 8 | Surface water quality monitoring serves to identify, track and respond to potential effects. The proposed surface water quality monitoring is presented in Section 8.4.19 of the EIAR.   | As required through the contractors CEMP |
| <b>Material Assets</b> |                                    |                |  |  |
| MM62                   | Land Use                           | EIAR Chapter 9 | <p>Optimised sizing of footprints of the proposed facility. This was carried out at the initial pre-planning design stage, where 3D modelling of the void space was carried out to determine the required footprint that would be needed for the landfill, thereby minimising the proposed land take and potential effects on Material Assets.</p> <p>Minimising areas for earthworks thereby reducing land take requirements. A cut/fill analysis was carried out for the landfill to calculate how much soil would be excavated and would require deposition in the surrounding area (as a berm). The suitably sized area was then designed for the berm. Autotrack models were run to ensure that truck movements within the proposed facility would be practical without using inappropriately excessive space. This minimised the areas that required topsoil stripping and surfacing with gravel and/or bitumen.</p> <p>Restricting areas for construction works and temporary storage to a minimum. The proposed contractor's yard for the construction works was designed to be big enough to fulfil its requirements without being so large that it would cover too much space.</p> | As required through the contractors CEMP |
| MM63                   | Land Use                           | EIAR Chapter 9 | Retention of all existing vegetation and regenerating peatland where possible and sufficiently protect the areas close to construction works as described in BS  | As required through the contractors CEMP |

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|                            |                             |                 | <p>5837:20051. The areas where existing vegetation is to be protected will be marked off temporarily during the construction and operational phases of the proposed development to ensure that machinery does not accidentally enter the areas.</p> <p>Proposed planting and/or allowing natural revegetation around the site will help integrate the proposed development into the current land use.</p>  |  |
| MM64                       | Land Use                    | EIAR Chapter 9  | <p>The main long-term mitigation measure will be the staged grassing of the mounds as each section is completed. Small shrubs will also be planted on the capped landfill to mitigate long term impacts relating to the proposed development. The vegetation would improve the visual appearance of the site, provide some useful habitat for biodiversity, and would also help to slow the surface runoff.</p>  | As required through the contractors CEMP   |
| MM65                       | Other Material Assets       | EIAR Chapter 9  | <p>As with any excavations there is a potential to disrupt local underground services. A confirmatory survey of all existing services will be carried out by a suitably qualified and experienced engineer and surveyor prior to the start of onsite construction works to verify the assumptions in this report and identify the precise locations of any services. The developer will liaise with the service provider where such services are identified. Digging around existing services, if present, will be carried out by hand to minimise the potential for accidental damage. Segregation of waste will be carried on site to maximise the potential for waste recycling and minimise any potential for effects on waste services.</p> | A suitably qualified engineer and surveyor will be appointed to oversee the effective implementation of the mitigation measures for the construction/operational phases of the proposed project. |
| <b>Noise and Vibration</b> |                             |                 |  |  |
| MM66                       | Noise and Vibration Control | EIAR Chapter 10 | <p>Construction phase noise and vibration impacts are determined to be not significant at the nearest off-site sensitive buildings. No specific mitigation measures are required to control noise or vibration during the construction phase given the significant distance between the site works and the nearest NSLs. Notwithstanding, best practice noise and vibration control measures will be applied on site as standard during this phase.</p> <p>With regard to construction activities, reference has been made to BS5228 Parts 1 and 2, which offer detailed guidance on the control of noise and vibration from</p>   | As required through the contractors CEMP   |

<sup>1</sup> <https://www.thenbs.com/PublicationIndex/documents/details?Pub=BSI&DocID=300496>



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|                                     |                      |                 | <p>construction activities. Best practice control measures will be considered and applied during the construction of the proposed development where necessary. Details are in the Construction Environmental Management Plan (CEMP).</p> <p>These measures will ensure that:</p> <ul style="list-style-type: none"> <li>• During the Construction Phase, the works will be managed to comply with the limits detailed in Section 10.2.1.1 of the EIAR using methods outlined in BS 5228-1; and</li> <li>• The best means practicable, including proper maintenance of plant and equipment, will be employed to minimise the noise produced by on site operations.</li> </ul>   |  |
| <b>Landscape and Visual Effects</b> |                      |                 |  |  |
| MM67                                | Landscape and Visual | EIAR Chapter 11 | <p>Selection of a site adjoining a similar existing facility.</p> <p>Minimising earthworks and change in levels.</p> <p>Restricting areas for construction works and temporary storage to a minimum.</p>   | As required through the contractors CEMP |
| MM68                                | Landscape and Visual | EIAR Chapter 11 | <p>Retention of all existing perimeter planting and re-generating vegetation where possible and sufficiently protect in areas close to construction works as described in BS 5837:2005.</p> <p>Disturbance of existing vegetation will be minimised where possible.</p>  | As required through the contractors CEMP |
| MM69                                | Landscape and Visual | EIAR Chapter 11 | <p>The landfill mounds will be vegetated as each section is completed. Proposed planting shown on the Landscape Plan will be on the landfill cap will precise species and positioning of shrubs and other woody vegetation will be determined at the detailed design stage and due consideration will be given to plant root structures to avoid potential for damage of the landfill cap geomembrane.</p> <p>In the shorter term, 5 m high berms enclosing the development from the north, east and west will be planted with bands of native peatland tolerant woodland mix taking into account the specific drier soil conditions of the mounding. Remaining areas of the berm will naturally revegetate over time.</p> | As required through the contractors CEMP |

| Air Quality and Climate |      |                 |   |  |
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| MM70                    | Dust | EIAR Chapter 12 | <p>In order to minimise dust emissions during construction of new phases, a series of mitigation measures have been prepared in the form of a dust minimisation plan. The dust minimisation measures outlined in the Plan (see Appendix 12-3) and Construction Environmental Management Plan (CEMP) (Appendix2-5) will be adhered to during the construction phase.</p> <p>In summary the measures which will be implemented will include the following;</p> <ul style="list-style-type: none"> <li>• Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic;</li> <li>• Furthermore, any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions;</li> <li>• Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates;</li> <li>• Vehicles delivering material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust;</li> <li>• Public roads outside the site will be regularly inspected for cleanliness, and cleaned as necessary;</li> <li>• Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods; and</li> </ul> | As required through the contractors CEMP |

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|  |                           |                 | <ul style="list-style-type: none"> <li>During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.</li> </ul> <p>At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.</p> |  |
| MM71                                       | Carbon Emissions          | EIAR Chapter 12 | Monitoring of the embodied carbon in the construction and operational phases will be conducted. The aim of the monitoring will be to seek further ways to minimise climate impacts. Monitoring will include; embodied carbon of construction materials, water usage, power and fuel usage and waste generation (including reuse and recycling rates). Where monitoring shows the proposed development is not meeting its targets further mitigation will be put in place.  | As required through the contractors CEMP   |
| <b>Archaeology &amp; Cultural Heritage</b> |                           |                 |  |  |
| MM72                                       | Archaeological Management | EIAR Chapter 13 | In the event of archaeological features, finds and/or deposits been encountered during the monitoring, all relevant authorities should be notified immediately. Preservation in-situ or preservation by record (excavation) may be required.   | An experienced and competent licence-eligible archaeologist will be employed to undertake archaeological monitoring working under licence issued by the minister (DHLGH) under section 26 of the National Monuments Acts (1994-2014) |
| <b>Traffic &amp; Transport</b>             |                           |                 |  |  |
| MM73                                       | Traffic & Transport       | EIAR Chapter 14 | The following are measures that will be implemented to mitigate the traffic and transportation effects of the proposed development:  | As required through the contractors CEMP   |

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|  |  |  | <ul style="list-style-type: none"> <li>• Photographic survey of haul roads again, immediately prior to commencement of construction;</li> <li>• Continuous monitoring of haul roads throughout the construction phase;</li> </ul> <p>In compliance with a request from Kildare County Council, Pavement Management Systems were commissioned to undertake the following surveys (Appendix 14.2) on existing and proposed haul routes:</p> <ol style="list-style-type: none"> <li>1) Falling Weight Deflectometer (FWD) testing.</li> <li>2) Ground Penetrating Radar (GPR) and cores where required.</li> <li>3) Road Condition Data (RCD) using Road Surface Profiler (RSP) including:             <ul style="list-style-type: none"> <li>• Digital Video (chainage and GPS referenced).</li> <li>• Visual condition survey from video survey using pavement condition index (PCI).</li> <li>• Ride quality survey using International Roughness Index (IRI).</li> <li>• Transverse profile for rut depth.</li> </ul> </li> </ol> <p>Surveys were carried out in June 2022. The surveys were undertaken in line with TII 'Guidelines for the use of the Falling Weight Deflectometer in Ireland'. As per the guidelines for two lane roads, the surveys were carried out in both traffic directions and at 50 m intervals with the tests being staggered in adjacent lanes.</p> <p>The assessment did not include sections of the haul routes which were on motorway or national roads as these roads have been designed to cater for larger traffic volumes. The Reports for all of the testing mentioned above are shown in Appendix 14.2 and include drawings showing the haul routes and associated chainages.</p> <p>The FWD level 1 survey covers the testing undertaken to assess the condition of the existing pavement layers and subgrade. The output from these are; D1 - overall pavement structural condition, surface curvature index (SCI) - the upper surface pavement condition, and D7 - the subgrade strength.</p> |  |
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|                                      |  |                      | These detailed pavement condition surveys will underpin the determination of maintenance costs of the life of the scheme and will facilitate and assessment of pavement defects that may arise during the construction period. It is proposed that any direct impact of construction on road structure during construction works will be identified to Kildare County Council and a schedule of maintenance agreed and carried out under the appropriate licences.  |  |
| <b>Operational Phase</b>             |  |                      |   |  |
| <b>Population &amp; Human Health</b> |  |                      |   |  |
| MM74                                 | Recreational amenity and Socio-Economics | EIAR Chapter 1 and 5 | The community benefit fund will provide benefits for the local community through the provision of environmental improvement and recreational or community amenities in the locality.  | To be operated and ran by a group of individuals including the Drehid WMF operator, members of the local community and others. |
| <b>Biodiversity</b>                  |  |                      |   |  |
| MM75                                 | Protection Measures for Bats             | EIAR Chapter 6       | <p>The location of the proposed new lighting was designed in consultation with a qualified ecologist with regard made to the NPWS guidelines. No lighting will be installed along bat commuting/ foraging routes.</p> <p>The luminaires used will use LED 3000K with a warm colour temperature as recommended within the guidelines. In addition, the luminaires will be full cut off/ flat glass type with no tilt (0% upright) which will minimise glare and light spill. Lighting at the landfill will be controlled and kept at a minimum.</p>  | As required through the contractors CEMP   |
| MM76                                 | Protection of Lepidoptera Species        | EIAR Chapter 6       | <p>A Habitat Management and Enhancement Plan is included within Appendix 6-3 of this EIAR. This management plan outlines measures that will be implemented to protect and enhance suitable lepidoptera habitats. Operational phase mitigation and monitoring measures are summarised below:</p> <ul style="list-style-type: none"> <li>• Capping of the waste management facility will use subsoil as this will create a species rich grassy habitat;</li> <li>• Wildflower seed mixes will not be used;</li> <li>• The use of “green hay” will be used to support reseeded of the landfill capping;</li> <li>• A mowing regime will be implemented and agreed with a suitably qualified ECoW;</li> </ul> | As required through the contractors CEMP   |

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|      |            |                | <ul style="list-style-type: none"> <li>No mowing will be carried out during the breeding bird season (1st March – 31st August);</li> <li>Mowing will not be uniform i.e. mowing certain areas will be rotated to every second year;</li> <li>Cutting will favour the retention of south facing slopes, south facing banks provide a warm microclimate for butterflies; and</li> <li>Alder buckthorn (<i>Frangula alnus</i>) will be included in landscaping plans, this species is the food plant of the brimstone butterfly (<i>Gonepteryx rhamni</i>) and several moth species; and</li> <li>Vegetation establishment and species composition will be monitored by a suitably qualified ecologist.</li> </ul>   |   |
| MM77 | Stormwater | EIAR Chapter 6 | <p>The proposed new, designed attenuation lagoons and ICW system form part of the proposed development and will treat all stormwater before discharging into the Cushaling River.</p> <p>Surface water quality will be monitored downstream of the ICW outlet (SW9) during the operational phase of the facility under the new IE License. All surface water sampling will be carried out by trained personnel from Bord na Móna or by suitably qualified consultants. All analyses, except for on-site readings, will be carried out off-site, by an accredited laboratory. A visual inspection of all surface water streams on and adjacent to the proposed development will be carried out by site personnel on a weekly basis.</p> <p>The key aspects of the surface water monitoring programme will be as follows:</p> <ul style="list-style-type: none"> <li>Surface water sampling locations will be identified with a permanent identification marker;</li> <li>Surface water will be sampled in accordance with industry standard protocols and guidelines prepared by the EPA. Samples will be handled and transported in accordance with accepted protocols; and</li> <li>The analytical programme will be carried out such that an ion balance can be computed.</li> </ul> <p>In the unlikely event that deterioration in the surface water quality being discharged is detected, an automated isolating valve will close. This isolating valve</p> | <p>All surface water sampling will be carried out by trained personnel from Bord na Móna or by a suitably qualified consultants</p> |

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|      |                                 |                        | <p>will allow for the retention of all surface water on-site until the contamination event is investigated and remediated.</p> <p>Annual biological monitoring will also be undertaken at SW4 during the monitoring period from June to September. Kick samples will be taken and analysed, in accordance with EPA guidelines, to determine the invertebrate colony of the surface water environment. A relationship between water quality and macroinvertebrate community structure will be determined in the form of a 'Q' value, where Q1 represents poor quality water and Q5 represents good quality water. The locations at which samples will be obtained will be agreed with the EPA and other relevant stakeholders such as Inland Fisheries Ireland (IFI).</p> <p>In relation to the ICW, a suitably qualified person with experience in ICWs will carry out monitoring and maintenance of the ICW. This will include:</p> <ul style="list-style-type: none"> <li>• Monitoring water level;</li> <li>• Influent and discharge monitoring – flow and quality;</li> <li>• Vegetation monitoring and maintenance within cells and around the site;</li> <li>• Maintenance of the inlet and outlet pipes; and</li> <li>• Sediment/sludge management.</li> </ul> |  |
| MM78 | Habitat & Vegetation management | NIS and EIAR Chapter 6 | <ul style="list-style-type: none"> <li>• Following the completion of the proposed construction works, the capping layer of the landfill will be planted with grass and shrub species, as each section is completed. Furthermore, the berms located around the north, east and west boundary will be planted with bands of locally sourced native peatland tolerant grass and shrub species. The vegetating of these areas will not only provide new habitats, but will also compact the peat, reducing runoff of suspended solids.</li> <li>• The land located to the east of the eastern berm will also be vegetated with peat tolerant grass and shrub species, which will create a natural vegetative buffer between the berm and the drainage ditch, again reducing runoff and will attenuate ammonia and suspended matter loads.</li> </ul>  |  |
| MM79 | Surface Water Quality           | NIS and EIAR Chapter 6 | <ul style="list-style-type: none"> <li>• All stormwater runoff will be collected and treated via the attenuation lagoon and ICW, which form part of the proposed development, prior to discharge into the Cushaling River. As the water passes through the new</li> </ul>   |  |



|  |  |  |   |  |
|--|--|--|---|--|
|  |  |  | <p>attenuation lagoons and ICW, attenuation of ammonia and suspended solids will be achieved.</p> <ul style="list-style-type: none"> <li>• Surface water quality will be monitored within and downstream of the proposed development during the operational phase of the facility at the monitoring locations shown Figure 7-1. Surface water quality will also be monitored at the inflow (SW8) of the new attenuation ponds and at the outflow of the ICW (SW9) during the operational phase of the facility under the new IE License.</li> <li>• As mentioned, all surface water sampling will be carried out by trained personnel from Bord na Móna or by suitably qualified consultants. All analyses, except for on-site readings, will be carried out off-site by an accredited laboratory. A visual inspection of all surface water streams on and adjacent to the proposed development will be carried out by site personnel on a weekly basis.</li> <li>• The key aspects of the surface water monitoring programme will be as follows: <ul style="list-style-type: none"> <li>○ Surface water sampling locations will be identified with a permanent identification marker;</li> <li>○ Surface water will be sampled in accordance with industry standard protocols and guidelines prepared by the EPA. Samples will be handled and transported in accordance with accepted protocols;</li> <li>○ The analytical programme will be carried out such that an ion balance can be computed.</li> </ul> </li> <li>• In the unlikely event that deterioration in the surface water quality being discharged is detected, an automated isolating valve will close. This isolating valve will allow for the retention of all surface water on-site until the contamination event is investigated and remediated.</li> <li>• Annual biological monitoring will also be undertaken at SW4 during the monitoring period from June to September. Kick samples will be taken and analysed, in accordance with EPA guidelines, to determine the invertebrate colony of the surface water environment. A relationship between water quality and macroinvertebrate community structure will be determined in the form of a 'Q' value, where Q1 represents poor quality water and Q5 represents good quality water. The locations at which samples will be obtained will be agreed with the EPA and other relevant stakeholders such as Inland Fisheries Ireland (IFI).</li> </ul> |  |
|--|--|--|---|--|

|   |                   |                |  |  |
|---|-------------------|----------------|--|--|
| MM80                                    |                   |                | <ul style="list-style-type: none"> <li>• Maintenance works will be subject to routines and procedures which are based on BnM's extensive operational experience (under licence) at the existing WMF.</li> <li>• The periodic removal of sediments within drainage ditches will be undertaken to maintain the existing drains.</li> <li>• A suitably qualified person with experience and training in ICWs will undertake regular monitoring and maintenance of the ICW during its operation. Operational and maintenance procedures will include the following:             <ul style="list-style-type: none"> <li>○ Water level management;</li> <li>○ Influent and effluent monitoring – flow and quality;</li> <li>○ Vegetation monitoring and maintenance within the cells and around the site;</li> <li>○ Maintenance of access;</li> <li>○ Maintenance of inlet and outlet pipes;</li> <li>○ Maintenance of embankments;</li> <li>○ Sediment and sludge management (desludging may be required every 10 years or more).</li> </ul> </li> </ul> |  |
| <b>Soils Geology &amp; Hydrogeology</b> |                   |                |  |  |
| MM81                                    | Maintenance Works | EIAR Chapter 7 | <p>Maintenance works will be subject to routines and procedures which are based on BnM's extensive operational experience (under licence) at the existing WMF. Operational procedures for handling and management of leachate, fuels and chemicals are in place, as described in Chapter 2 of this EIAR.</p> <p>Because operational maintenance activity is conducted in parallel with construction activity (in adjacent phases), and risks are of a similar nature, the key measures that apply for maintenance works are covered by those outlined in Section 7.5.2 of the EIAR.</p> <p>In the unlikely event that pollutants escape the lined waste cells during operations, the pollutants will attenuate in the subsurface (groundwater) environment and be captured by the under-cell drainage system which acts as a second protection barrier (additional to the liner and leachate collection system). This is a highly unlikely event, because a) the landfill expansion is planned and</p>   | As required through the contractors CEMP |

|                        |  |                |  |  |
|------------------------|--|----------------|--|--|
|                        |  |                | designed to prevent this from occurring, and b) this is not occurring at the existing WMF.   |  |
| MM82                   | Groundwater Lowering by the Under-cell Drainage System               | EIAR Chapter 7 | The under-cell drainage system is necessary as a control measure to prevent damage to the landfill liner during waste deposition. Dewatering effects will be countered near the landfill footprint by maintaining water levels in the drainage network as high as possible and as close to the landfill expansion as possible, by the blocking of drains (Section 7.5.2.2 of the EIAR). The aim is to maintain water levels high in the peat outside the landfill expansion footprint. | As required through the contractors CEMP |
| <b>Water</b>           |  |                |  |  |
| MM83                   | Maintenance Works  | EIAR Chapter 8 | Maintenance works will be subject to routines and procedures which are based on BnM's extensive operational experience (under licence) at the existing WMF.<br><br>Because operational maintenance activity is conducted in parallel with construction activity (in adjacent phases), and risks are of a similar nature, (e.g., accidental spills and leaks), the key measures that apply for maintenance works are covered by those outlined in Section 8.5.2 of the EIAR.            | As required through the contractors CEMP |
| MM84                   | Water Management and Discharges from New Attenuation Lagoons and ICW | EIAR Chapter 8 | The proposed new, designed attenuation lagoons and ICW system is a necessary mitigation measure. As presented in Appendix 2-4 of the EIAR, it is specifically designed to remove ammonia and suspended solids in the discharge. It will serve to reduce loads that would otherwise be higher, which will benefit the receiving water environment.  | As required through the contractors CEMP |
| MM85                   | WFD Status of Surface Water Bodies                                   | EIAR Chapter 8 | Relevant mitigation measures are those referred to in Sections 8.5.3.1 (Maintenance Works) and 8.5.3.2 (Water Management and Discharges from New Attenuation Lagoons and ICW) of the EIAR and include the new attenuation lagoons and ICW system.  | As required through the contractors CEMP |
| <b>Material Assets</b> |  |                |  |  |
| MM86                   | Material Assets  | EIAR Chapter 9 | Mitigation referred to in the construction phase also applies here.  | As required through the contractors CEMP |

| Noise and Vibration     |             |                 |  |  |
|-------------------------|-------------|-----------------|--|--|
| MM87                    | Noise Level | EIAR Chapter 10 | <p>In order to ensure noise levels associated with the operational phase of the development are minimised as far as practicable, the following mitigation measures will be incorporated into the site design as best practice;</p> <ul style="list-style-type: none"> <li>• All roller shutter doors and building access points are maintained closed at all times and opened only to permit vehicle and personnel entrance/egress, and;</li> <li>• All operational plant will be switched off during evening and night-time periods when the facility is not in operation, with the exception of the fixed plant items required to operate on a continual basis for odour control and gas utilisation.</li> </ul>   | As required through the contractors CEMP |
| Air Quality and Climate |             |                 |  |  |
| MM88                    | Odour       | EIAR Chapter 12 | <p>The Drehid facility (W0201-03) operates an odour mitigation and management plan which includes a range of practical odour abatement measures for the Composting Facility. All processes associated with the Composting Facility are internal within buildings under negative pressure so air does not escape from the buildings.</p> <p>An odour management plan will be in place for the proposed landfill facility. This plan includes management strategies for the prevention of emissions and a strict preventative maintenance and management program for ensuring that all odour mitigation techniques remain operational at optimal capacity throughout all operational scenarios. Good housekeeping practices (internally and externally) and a closed-door management strategy will also be maintained at all times.</p> <p>If composting temperatures exceed approximately 65°C, odour emissions increase significantly, due to the changes in process biochemistry. Excessive increases in composting temperatures are especially relevant in the first stage of composting when, due to the fast degradation, a lot of energy is released. Temperature sensors are used to measure the temperature in the composting tunnels and subsequently in the maturation area. The SCADA control system ensures that the composting temperature does not exceed 65°C by adding more</p> | As required through the contractors CEMP |

|      |             |                 |   |  |
|------|-------------|-----------------|---|--|
|      |             |                 | <p>fresh process air to the composting mass. This reduces the odour load in the process air being transported to the odour abatement systems.</p> <p>Critical and key odour abatement system performance parameters are continually monitored on the SCADA control system. Should any parameter deviate outside of its accepted range, an alarm will be immediately generated. Critical alarms will be texted to selected mobile phone numbers thereby ensuring the communication of critical alarms to responsible individuals on a 24 hour basis.</p> <p>The biofilters are maintained to ensure optimum performance. Biofilters are compartmentalised to facilitate maintenance and replacement of media. Each biofilter comprises two sections such that treatment is provided by one of the sections while the other section is being maintained. Biofilters are covered and hence isolated from extreme weather conditions (e.g. intensive rainfall or intensive heat) thereby providing optimum control of biofilter efficacy.</p>   |  |
| MM89 | Air Quality | EIAR Chapter 12 | <p>There is no significant predicted operational phase impact with respect to air quality from traffic. However, some site-specific mitigation measures are required for the existing development, in particular the prevention of vehicles from having engines idling while waiting to be processed, even over short time periods.</p> <p>The review of road traffic for impacts on human and ecological receptors has found no significant impacts that require mitigation measures with respect to the modelling of emissions. However, some mitigation measures can be put in place to minimise emissions:</p> <ul style="list-style-type: none"> <li>• Implement a policy which prevents idling of vehicles both on and off-site including HGV holding sites;</li> <li>• Traffic should be monitored to ensure vehicles are using the designated haul routes;</li> <li>• Efficient scheduling of deliveries to minimise number of deliveries required, and in turn their emissions; and</li> <li>• Construction vehicles should conform to the current EU emissions standards and where reasonably practicable, their emissions should meet upcoming standards prior to the legal requirement date for the new standard. This will ensure emissions on haul routes are minimised.</li> </ul> | As required through the contractors CEMP |

|      |               |                 |  |  |
|------|---------------|-----------------|--|--|
|      |               |                 | <p>Mitigation measures are required for the control of dust with respect HGV moments onsite with the site and deliveries to/from the site:</p> <ul style="list-style-type: none"> <li>• HGV traffic leaving site will pass through a wheel wash;</li> <li>• Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary. If public roads are deemed to require additional cleaning where possible a suction device for road cleaning will be utilised can access spaces around cars and other street furniture more effectively; and</li> <li>• During movement of materials both on and off-site, trucks will be stringently covered at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.</li> </ul>  |  |
| MM90 | GHG Emissions | EIAR Chapter 12 | <p>Vehicles, generators etc., will give rise to some GHG emissions, however the proposed development's impact on climate due to traffic can be minimised through mitigation measures. The following mitigation measures will be put in place to minimise emissions:</p> <ul style="list-style-type: none"> <li>• Implement a policy which prevents idling of vehicles both on and off-site including HGV holding sites;</li> <li>• Construction Phase traffic should be monitored to ensure construction vehicles are using the designated haul routes;</li> <li>• All plant and machinery will be maintained and serviced regularly;</li> <li>• Efficient scheduling of deliveries will be undertaken to minimise emissions; and</li> <li>• Construction vehicles should conform to the latest EU emissions standards and where reasonably practicable, their emissions should meet upcoming standards prior to the legal requirement date for the new standard. This will ensure emissions on haul routes are minimised.</li> </ul> <p>Monitoring of carbon emissions will also include the ongoing management of adaptation and mitigation in order to measure their effectiveness, with consideration given to the vulnerabilities to extreme heat and cold noted in Section 12.4.4 of the EIAR. Emissions from the composting and landfill process will be minimised through good practice measures and management however are vulnerable to extreme heat. If monitoring of adaptation measures and mitigation measures indicates the measures are not effectively minimising embodied carbon</p> | As required through the contractors CEMP |

|  |             |                 |   |   |
|--|-------------|-----------------|---|---|
|  |             |                 | <p>or climate is impacting on the construction of the proposed development then they should be reviewed and updated.</p> <p>The majority of mitigation measures with respect to the proposed developments vulnerability to climate change are set out through management plans, designing out potential issues. Operational Phase climate vulnerability should be reassessed on an annual basis in order to respond to new scientific data on potential climate change impacts.</p> <p>The impact of the landfill emissions are mitigated by the collection of the landfill gases emitted (as per Table 12.27 in the EIAR) to produce electricity. A landfill gas collection system will be installed to safely collect and divert this gas from the new landfill to the existing landfill gas management compound which includes landfill gas flares and landfill gas utilisation plant (LGUP) which generates electricity. The amount generated will vary throughout the lifespan of the landfill as the waste decomposes. Landfill gas generation rates will vary considerably over the lifetime of the facility and is discussed in more detail in Section 2.3.4 of the EIAR.</p> <p>The operational phase will have carbon sinks in the form of approximately 72.57 ha of the site being allowed to be vegetated. Further areas of revegetation will be created where possible. In addition, in areas where it is practical gradual drain blocking will also encourage water levels to rise resulting in the rewetting of peat which is currently dried out. A bog rehabilitation plan is being conducted for areas outside the project redline boundary which includes drain blocking to encourage rewetting.</p> |   |
| <b>Archaeology &amp; Cultural Heritage</b> |             |                 |   |   |
| MM91                                       | Archaeology | EIAR Chapter 13 | <p>The following mitigation measures will be implemented during the construction phase:</p> <ul style="list-style-type: none"> <li>• All ground disturbance associated with the construction of the proposed development will be monitored by a suitably qualified archaeologist working under licence as issued by the minister (DHLGH) under section 26 of the National Monuments Acts (1994-2014).</li> <li>• In the event of archaeological features, finds and/or deposits been encountered during the monitoring, all relevant authorities should be</li> </ul>   | <p>All ground disturbance associated with the construction of the proposed development will be monitored by a suitably qualified archaeologist working under licence. Also as required through the contractors CEMP</p> |



|                                |                      |                 |  |  |
|--------------------------------|----------------------|-----------------|--|--|
|                                |                      |                 | notified immediately. Preservation in-situ or preservation by record (excavation) may be required.   |  |
| <b>Traffic &amp; Transport</b> |                      |                 |  |  |
| MM92                           | Traffic & Transport  | EIAR Chapter 14 | <p>The following are measures that will be implemented to mitigate the impact associated with the facility:</p> <ul style="list-style-type: none"> <li>• Continuous monitoring of haul roads throughout operational phase;</li> <li>• All contractors, delivering waste to the facility and removing outputs from the facility, and all construction contractors will undergo and induction progress and will ultimately be issued with a map of the permitted haul routes such that all materials imported into the site and exported out of the site are transported via the identified and agreed haul routes. A penalty system will be operated by Bord na Móna to ensure haulage operators comply with these requirements;</li> <li>• Use existing wheel wash facilities at the Waste Facility during both the construction and operational phase to reduce the potential for deposition of dirt or detritus on the public road. The existing 4.8 km private access road also aids in this regard;</li> <li>• Maintenance of warning signage on the approach to the entrance;</li> <li>• Monitoring of parking requirements during the operational phase with additional spaces to be provided if required;</li> <li>• Maintenance of site entrance ensuring visibility splays remain unobstructed; and;</li> <li>• Monitoring of haul routes performance.</li> </ul> | As required through the contractors CEMP |
| <b>Decommissioning Phase</b>   |                      |                 |  |  |
| <b>Biodiversity</b>            |                      |                 |  |  |
| MM93                           | General Biodiversity | EIAR Chapter 6  | Impacts during decommissioning are expected to be of similar type and magnitude to those anticipated during the construction phase, but generally of a shorter duration. Therefore, the same mitigation measures implemented during the construction phase, will be applied during the decommissioning works.  | As required through the contractors CEMP |

|      |                      |                        |   |  |
|------|----------------------|------------------------|---|--|
| MM94 | Habitats and Ecology | NIS and EIAR Chapter 6 | <p>All structures proposed to be removed, will be removed offsite, while below ground structures will be filled with clean and free from invasive species material. Hardstanding areas will be rehabilitated by covering with local topsoil and allowed to revegetate. The landfill body will be restored as per the proposed levels set out in the restoration drawings and in accordance with the landscaping plan.</p> <p>In the event that the composting plant and MSW processing plant are to be decommissioned, the following measures will be undertaken to ensure that there will be no adverse environmental effects from the closed facilities:</p> <ul style="list-style-type: none"> <li>• Bord na Móna will ensure that any remaining waste materials within the facility are managed and removed off-site to an appropriately licensed facility;</li> <li>• All oils and fuels on site at the time of closure, that are not required for long-term aftercare, will be collected by an approved waste contractor;</li> <li>• All mobile plant and equipment associated with the facility will be removed from the site;</li> <li>• All site floor and process building walls will be power cleaned to clear all debris and dust;</li> <li>• All tanks will be de-sludged and interceptors cleaned. The waste from the cleaning operations will be disposed to relevant licensed facilities;</li> <li>• Where possible, all portable or removable structures will be dismantled or removed from site;</li> <li>• The weighbridge, weighbridge kiosk and wheel wash will be decommissioned and removed; and</li> <li>• A monitoring programme of all potential emissions including surface water and dust will be conducted after the decommissioning process in order to ensure that emissions from the facility have ceased.</li> </ul> <p>When the operations have ceased on site, as per the requirements of the Landfill Directive, monitoring and analysing of landfill gas and leachate from the site and the groundwater regime in the vicinity of the site, shall continue as required by the EPA.</p> <p>The commitments to restoration and aftercare of the landfill are as follows and adhere to the guidance set out in the EPA's <i>Landfill Manual: Landfill Restoration and Aftercare (1999)</i>:</p> | As required through the contractors CEMP |
|------|----------------------|------------------------|---|--|

|                        |                  |                |  |  |
|------------------------|------------------|----------------|--|--|
|                        |                  |                | <ul style="list-style-type: none"> <li>• On cessation of filling at each cell of the landfill, the final capping layer will be installed which will include a low permeability LLDPE liner and soil layer;</li> <li>• This final capping will initially be seeded with grass to limit dust blow on these areas;</li> <li>• The site will then be left to recolonise with natural species;</li> <li>• The site will be landscaped in accordance with the landscape proposals;</li> <li>• Gas extraction and leachate treatment will continue post closure; and</li> <li>• Monitoring of surface and groundwater quality and other parameters as outlined in Section <b>Error! Reference source not found.</b> of the NIS will continue post closure.</li> </ul> |  |
| <b>Material Assets</b> |                  |                |  |  |
| MM95                   | Waste Management | EIAR Chapter 9 | Segregation of waste will be carried on site to maximise the potential for waste recycling. Appropriately licensed waste collectors will be used to remove any municipal waste, wastewater or general demolition waste that does occur on site. The majority of wastes from decommissioned infrastructure will be recyclable (e.g. metal signage).   | As required through the contractors CEMP |

## Appendix 4.2 – Peat Management Plan

# Bord na Móna

Drehid Waste Management Facility – Further Development

Peat Management Plan



# Drehid MWF

## PEAT MANAGEMENT PLAN

| Document Control Sheet |  |
|------------------------|--|
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| Report Status          | Final  |
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| Client Address:        | Bord na Móna PLC.<br>Main Street,<br>Newbridge,<br>Co. Kildare<br>W12 XR59 |
| Project Number         | 10889  |

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|          |             |         |          |              |          |                |          |
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CONSULTING ENGINEERS  
OF IRELAND



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## 1.0 INTRODUCTION

The Proposed Development site (See Figure 1-1) is located within the Timahoe South Bog (TSB), Co Kildare. TSB is a cutover/cutaway bog. The topography across the overall Bord na Móna landholding is relatively flat ranging from 80 m above ordnance datum (AOD) to 90 mAOD. The existing landfill at the site is well screened from nearby roads by existing hedgerows and trees and is located a considerable distance from the main road network in each direction, i.e., >750 m north to the L5025, >2.1 km east to the L1019 and >2.4 km south and east to the R403.

The topography underlying the Proposed Development is flat and gently undulating, ranging from 82.0 mAOD to 86.5 mAOD. Existing vegetation provides significant screening from the general public and will be supplemented by additional planting.

TSB is flanked to the immediate north by Timahoe North bog, with Gilltown bog located to the northeast of the site. The village of Derrinturn is located approximately 2.6 km to the west of the Proposed Development site boundary and Timahoe crossroads is located approximately 1.7 km to the east of the closest edge of the Proposed Development site boundary. Carbury is located approximately 6 km to the north-west of the Proposed Development and Prosperous is approximately 8.3 km to the south-east. The existing and operational waste management facility at Drehid is accessed from the R403 Regional Road via a dedicated entrance and private 4.8 km long access road.

The Proposed Development application area (the area within which the application for development is being made) is confined to an area of 262 hectares (ha), outlined in red on Figure 1.1. This Proposed Development is situated in the townlands of Timahoe West, Coolcarrigan, Killinagh Upper, Killinagh Lower, Drummond, Kilkeaskin, Loughnacush, and Parsonstown, County Kildare as outlined in red on Figure 1.1.

Land use within and adjacent to the Proposed Development, and across the majority of the landholding, comprises disused cutaway bogland which was used historically for the commercial production of sod peat. The planned expansion area currently forms a mosaic of young pine and scrub woodland with dry heath. TSB is surrounded by agricultural lands to the west, south and east, with a scattered rural pattern of farms and residential dwellings along local roads.

This Peat Management Plan (PMP) is focused on the Proposed Development site and the activities required to construct the Proposed Development and supporting infrastructure.

The surrounding landscape is a mixture of forestry, agricultural land and cutaway peatland is defined as the partially decomposed remains of plants and soil organisms which have accumulated at the surface of the soil profile. Active peatlands are traditionally described using a simple 2-layer model; the acrotelm including active peat vegetation and catotelm. As the Proposed Development is a cutaway bog, the peat on site is predominantly drained catotelm on flat or gently sloping lands. It is proposed to manage peat within the site boundaries. Bord na Móna has considerable experience in the handling of peat in these circumstances, both during peat production operations and during the rehabilitation processes associated with its cutaway bogs. This experience has shown that when the handling and moving of such peat is appropriately managed, stability or environmental issues are not expected to arise.

## 1.1 OBJECTIVE

The role of the PMP is to demonstrate that the management of peat excavated during construction of the proposed project has been considered and will be treated appropriately during the construction process.

This PMP also includes a monitoring programme which will be implemented during the construction phase of the Proposed Development and a contingency plan should peat instability/failure occur at the site. The PMP acts as a live document arising from information presented during the consenting process, planning conditions and the content of which will be updated as work is carried out on site.

The PMP contains some drainage guidelines for construction works and for management of peat on site. It should be noted that the control of water quality and drainage measures for site is outlined in detail in Chapter 8 (Water) of the EIAR and within the Construction and Environmental Management Plan (CEMP) Appendix 2-5 of the EIAR.

The PMP outlines the overall design approach that has been applied to the proposed project to minimise peatland disruption and aims to ensure that all opportunities to minimise peat disturbance and extraction during construction will be taken. The SMP identifies appropriate and industry proven methods for the reuse of excess peat to restore the effects of construction activities, without significant environmental or health and safety implications, to reduce the release of carbon and minimise risk in terms of human health.

The development will consist of an extension of the existing Drehid WMF to provide for the acceptance of up to 440,000 TPA of non-hazardous waste material, comprising:

- Increase in acceptance of non-hazardous household, commercial & industrial and C&D waste at the existing landfill from the currently permitted disposal quantity of 120,000 TPA to 250,000 TPA until the permitted void space in the existing landfill is filled and no later than the currently permitted end date of 2028;
- Development of extended landfill footprint of approximately 35.75 ha to accommodate the landfilling of 250,000 TPA of non-hazardous household, commercial & industrial and C&D waste for a period of 25 years to commence once the existing landfill void space is filled. The new landfill will have a maximum height of approximately 32 m above ground level (115.75 mAOD);
- Provision, as part of the extended landfill infrastructure, for 30,000 TPA of contingency disposal capacity for non-hazardous waste, to be activated by the Planning Authority only as an emergency measure, for a period of 25 years;
- Development of a new Processing Facility, for the recovery of 70,000 TPA of inert soil & stones and C&D waste (rubble) and use of same for engineering and construction purposes within the site, including as engineering material in the landfill;
- Increase in acceptance of waste at the existing Composting Facility from 25,000 TPA to 35,000 TPA and removal of the restriction on the operating life of the Composting Facility contained in Condition 2(2) of ABP Ref. No. PL.09.212059;
- Extension to, and reconfiguration of, the existing Composting Facility to provide for a new MSW Processing and Composting Facility with an additional capacity of 55,000 TPA (giving a combined total for the MSW Processing and Composting Facility of 90,000 TPA), allowing for the combined facility to accept both MSW and other organic wastes;
- Construction of a new odour abatement system at the existing Composting Facility including two emissions stacks to a height of 17 m above ground level;

- Construction of a new odour abatement system as part of the new MSW Processing and Composting Facility including two emissions stacks to a height of 17 m above ground level;
- Development of a new Maintenance Building with staff welfare facility, office, storage and a laboratory;
- Installation of a new bunded fuel storage area to the rear of the new Processing Facility for the recovery of soil & stones and C&D waste (rubble);
- Construction of two new permanent surface water lagoons and one new construction stage surface water lagoon;
- Construction of a new integrated constructed wetland (ICW) area comprising five ponds;
- Car-parking provision for operational staff;
- Landscaping and screening berms; and
- All associated infrastructure and utility works necessary to facilitate the Proposed Development and the restoration of the facility following the cessation of waste acceptance.

A full detailed project description is provided in Chapter 2 of the EIAR.

## 1.2 GUIDANCE

The legislation and guidance regarding the management of peat includes:

- Scottish Environment Protection Agency (SEPA), Regulatory Position Statement – Developments on Peat (2010);
- Scottish Government, Guidance on Developments on Peatland – Site Surveys (2014); and
- Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste, Scottish Renewables and SEPA (2014).

While the following guidance specifically relates to wind farm construction, it is also relevant to construction management of peat and peatland area:

- Investigating the impacts of wind farm development on peatlands in England: Part 1 Final Report (2011);
- Best Practice Guidance to Planning Policy Statement ‘Renewable Energy’ (2009);
- Wind Farm Developments on Peat Land fact sheet. Scottish Government (2011); and

Many of the publications listed above have been developed by the Scottish Government. The Scottish documents are considered to be best practice in Ireland and are therefore appropriate for use within this PMP.

The guidance identifies three main stages in the development process and describes what data should be gathered and assessed at each to inform a site specific PMP:

- Stage 1: Environmental Impact Assessment (EIA);
- Stage 2: Post-consent / pre-construction; and
- Stage 3: Construction.

This PMP has been prepared in accordance with the principles in the guidance for Stage 1 and proposes that prevention and re-use are the most appropriate means of managing peat excavated during construction at this site. This report details the methodologies required to assess all potential surplus materials and presents the expected volume of excavated materials and required reuse volumes for reinstatement and restoration purposes.

## 1.3 PEAT DESCRIPTION

Organic material > 0.5 m depth is not defined as peat. This is in accordance with guidance from:

- Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland states that '*Peat soil is an organic soil which contains more than 60 per cent of organic matter and exceeds 50 centimetres in thickness*'; and
- The James Hutton Institute define shallow peat as having '*a prescribed depth of organic matter of 50 – 100 cm<sup>1</sup>*'

Also, The Forestry Commission use 45 cm as the critical depth for peat to occur (*Understanding the greenhouse gas (GHG) implications of forestry on peat soils in Scotland, 2010<sup>2</sup>*);

- Peat can therefore be classified as organic material over 0.5 m in depth.

Peat can be separated into three main layers: acrotelm (the upper living layer), catotelm (the middle to lower layer) and occasionally amorphous (lower layer) peat:

- Acrotelm peat is the living layer of the peat including the peat turf or turve being a thin, floating vegetation mat layer. The acrotelm is found within the top layer of peat (often less than 0.5 m) depending on the degree of decomposition and fibrous nature of the peat (H1 to H6 on the von post classification scale). The acrotelm is generally of high permeability, decreasing with depth. The water table fluctuates in this layer and conditions vary from aerobic to anaerobic. Material may be fibrous or pseudofibrous (plant remains recognisable), spongy, and when excavated strength is lost but retains integral structure and can stand unsupported when stockpiled >1 m.
- Catotelm peat is the dead layer of peat found deeper than acrotelm peat which has some remnant plant structures. Material has high water content and is permanently below the water table (saturated) therefore organic matter decomposes anaerobically. Some plant structures may be recognisable but are highly humified losing most of their characteristics (approximately H6 to H9 on the von post classification scale) and strength. Water flow in the catotelm is slow unless peat structures such as sink holes or peat pipes are present.

The best management option to minimise potential surplus peat is to prevent its production. Therefore, the design of the project has aimed to minimise peat excavation where possible. Discussion of design considerations to avoid deeper areas of peat is included in Appendix 7-6: Peat Stability Risk Assessment and Chapter 3: Reasonable Alternatives of this EIAR.

SEPA has provided a hierarchy of management approaches in which the effectiveness of the approach to peat management is optimised at development sites as summarised below (SEPA 2010, SEPA 2012):

1. prevention: avoiding generating excess peat during construction (e.g., by avoiding peat areas or by using construction methods that do not require excavation such as floating tracks);
2. re-use: use peat produced on site in habitat restoration of hardstanding or landscaping;

<sup>1</sup> <https://www.hutton.ac.uk/learning/exploringscotland/soils/organicsoils>

<sup>2</sup> <https://www.forestresearch.gov.uk/publications/understanding-the-greenhouse-gas-ghg-implications-of-forestry-on-peat-soils-in-scotland/>

3. recycling/recovery/treatment: modify peat produced on site for use as fuel, or as a compost/soil conditioner, or dewater peat to improve its mechanical properties in support of re-use; and
4. storage: temporarily store peat on-site (for example, during short periods in the construction phase) and then re-use.

In relation to the SEPA guidance the following has been applied to the design and construction of the proposed project:

1. Reuse of material is proposed for landscaping and restoration.
2. Recycling/recovery is not appropriate on this site; and
3. Temporary storage and reuse are proposed.

### ***1.3.1 Peat Conditions on Site***

The site was assessed for peat vegetation in desktop review of maps and plans, previous SI data, site walkovers by ecologists and hydrologists between July 2020 and July 2022; intrusive site investigation in terms of coring across the Proposed Development site and access track routes. A site investigation (SI) and monitoring programme was undertaken across TSB, with a focus on the Proposed Development area, between July 2020 and July 2022, in support of the current EIAR.

The proposed new development area covers a total area of approximately 88.9 hectares (ha) and ranges in elevation between approximately 81 and 90 mOD. The bog is surrounded by gentle hills that reach maximum elevations of 116 mOD in the townland of Hodgestown to the east and 142 mOD in Carbury to the west. The Proposed Development area is situated entirely within TSB.

Soils within TSB and the landfill expansion area consist entirely of cutover peat. The residual peat, which is exposed along drains and along margins of stripped areas, is significantly exploited and degraded. The importance/sensitivity of peat in the Proposed Development area is considered to be Low. Forestry is absent from the development area. Based on data presented in the 2017 EIAR, the thickness of residual peat across TSB ranges from zero (stripped peat) to 3.5 m. Near the existing WMF and landfill expansion area, and based on the additional information from newly drilled boreholes, recorded thicknesses range from 0.0 to 3.5 m. Several man-made drains cut through the site, draining typically to the southwest

Subsoils across the landholding are mapped as 'cutover raised peat'. TSB is bordered to the west, south and east by glacial till derived from limestones. Bedrock across TSB is mapped by GSI as 'Waulsortian Limestone', with the Lucan Formation present to the northwest and the Allenwood Formation present to the east.





*Plate 1-1: Exposed subsoils beneath stripped peat near the landfill expansion area*

Depth to water in the measured peat wells is significantly deep, >0.5 m, showing the effects of bog drainage. Some peat wells were dry throughout the monitoring period (e.g., MW02P), or had measurable water levels only in February and March 2022 (e.g., MW05P).

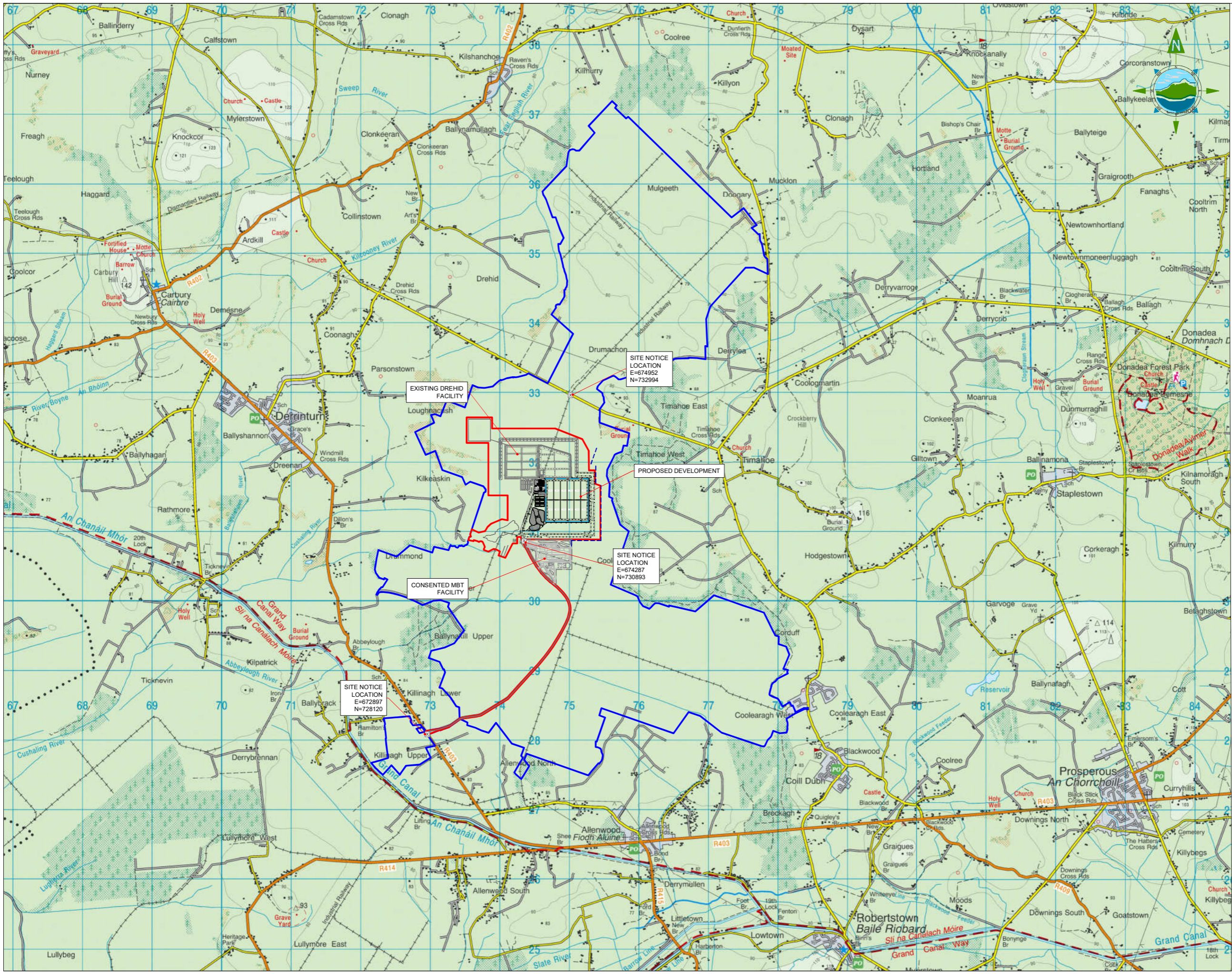
### ***1.3.2 Peat Survey Methodology***

To obtain a detailed understanding of the spatial and depth distribution of peat and its properties, a series of tasks have been completed which include:

- Habitat mapping detailed within Chapter 6 – Biodiversity;
- Collection of peat samples for laboratory analysis incl. moisture content;
- Development of a peat depth map to indicate the maximum depth of probe penetration at all investigated points across the Proposed Development;
- Calculation of the maximum potential peat volumes that will be removed due to excavation for infrastructure based on the depth penetration probing results;
- Examination of areas where peat is re-used to allow calculation volumes; and
- Peat probing was not carried out as it was determined that sufficient data existed from the CDM Smith borehole campaign, in addition to the data from the 2017 EIAR, to carry out the Peat Stability Risk Assessment.

Site investigation locations are included below on Figure 1-2.





**GENERAL LEGEND**

BORD NA MÓNA OWNERSHIP BOUNDARY — APPLICATION BOUNDARY —

SITE NOTICE LOCATION X

**NOTES:**

- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
- ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
- ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
- THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES.
- ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD.

OSI 1:50,000 DISCOVERY SERIES SHEET NO'S: 2620, 2622, 2624, 2820, 2822 & 2824  
 Ordnance Survey Ireland Licence number CYAL5023107.  
 © Ordnance Survey Ireland/Government of Ireland

500m 0m 500m 1.0km 1.5km

| Rev | Date     | Description    | By | Chkd. |
|-----|----------|----------------|----|-------|
| A   | 26.04.23 | PLANNING ISSUE | MN | RH    |

Client:  
**Bord na Móna**

Project:  
**DREHID WASTE MANAGEMENT FACILITY FURTHER DEVELOPMENT**

Title:  
**REGIONAL SITE LOCATION MAP**

Scale @ A1: **1:25,000**

Prepared by: **M. Nolan** Checked: **R. Hunt** Date: **November 22**

Project Director: **S. Tinnelly**

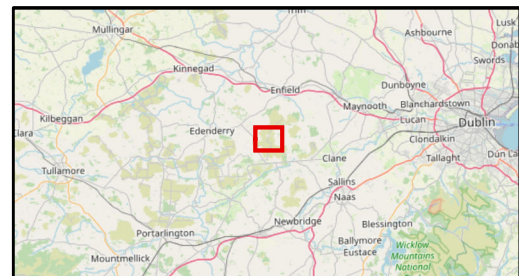
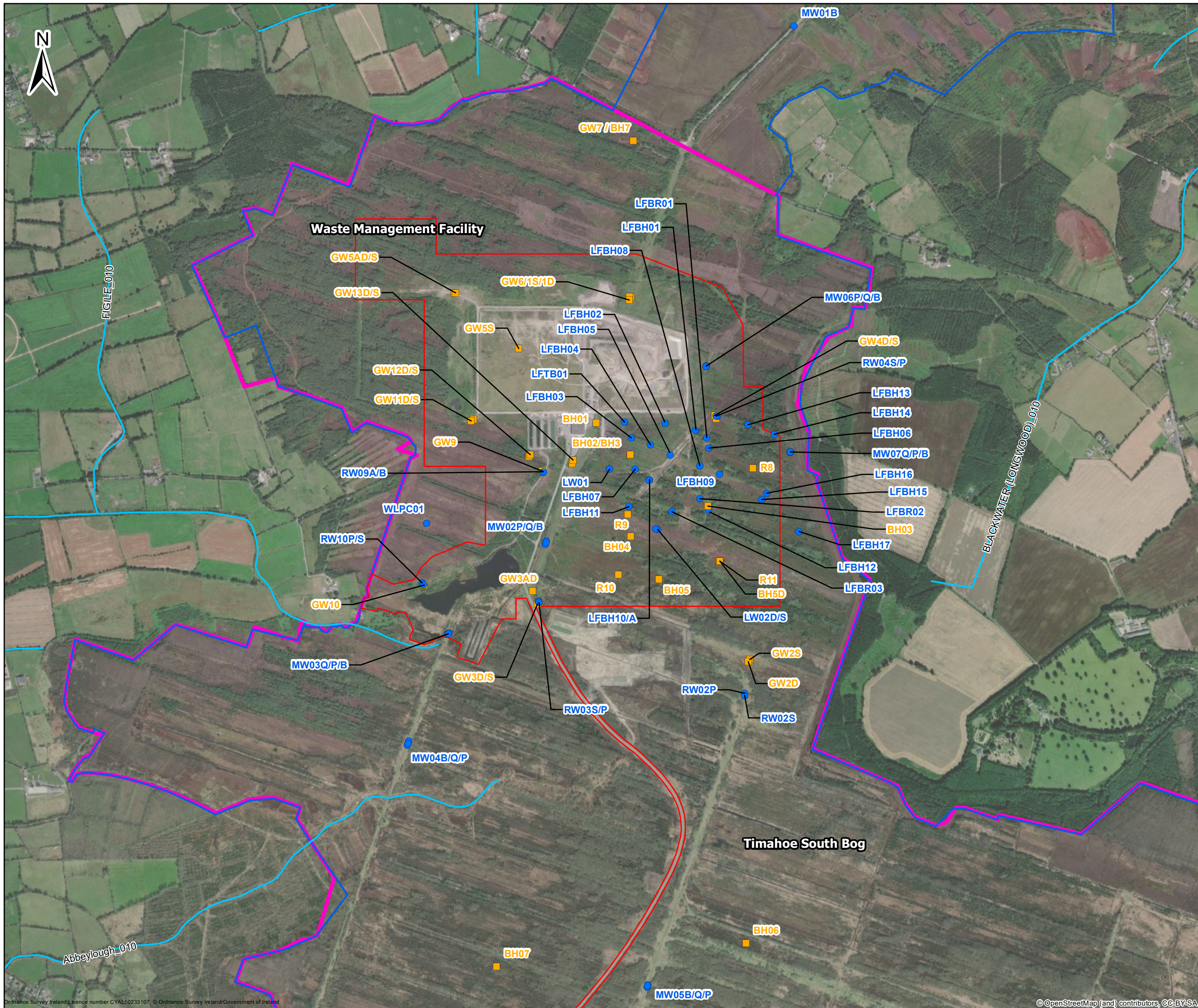
Drawing Status: **Planning**

**TOBIN**  
 CONSULTING ENGINEERS

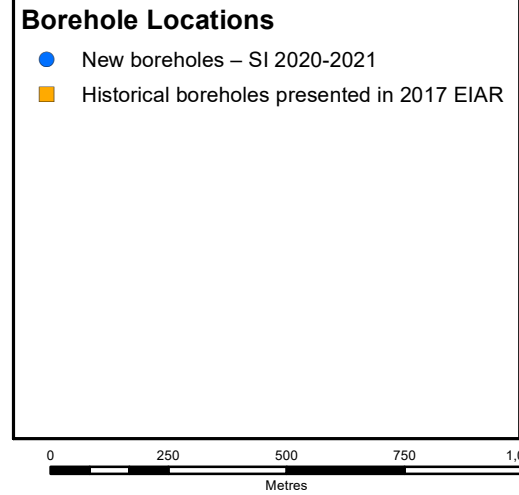
Block 10-4, Blanchardstown Corporate Park, Dublin 15, Ireland.  
 tel: +353-(0)1-8030406  
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 e-mail: dublin@tobin.ie  
 www.tobin.ie

Drawing No.: **Figure 1-1** Revision: **A**





- Legend**
- Planning Application Boundary
  - Bord na Móna Ownership Boundary
  - Timahoe South Bog Boundary
  - WFD - River Water Bodies
- Borehole Locations**
- New boreholes – SI 2020-2021
  - Historical boreholes presented in 2017 EIAR



- NOTES**
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
  2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
  3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
  4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALN HEAD

| Issue | Date       | Description | By  | Chkd. |
|-------|------------|-------------|-----|-------|
| A     | 29/05/2023 | Final issue | S.P | J.S   |

Client:  
**Bord na Móna**

Project:  
Drehid Waste Management Facility Further Development

Title:  
Borehole Locations

Scale @ A3: 1:16,000

Prepared by: S.Pezzetta      Checked: J.Staunton      Date: May 2023

Project Director: D.Grehan

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## Habitat Conditions

Habitat mapping was undertaken by Project Ecologists and is detailed within Chapter 6 Biodiversity of the EIAR.

The majority of the Proposed Development site comprises re-vegetated cutover peat (PB4), large patches of bog woodland (WN7), several large drainage ditches (FW4), artificial surfaces (BL3), a grassy verge (GS2), with a small area of recolonising bare ground (ED3). The Proposed Development drains into the Cushaling River located at the south-western corner of the Proposed Development site.

A comparison of the peat depth with the site infrastructure footprint. These data indicate that peat depth of 3.6 m or less (typically c. 2 m) is present across the Proposed Development site.

## Peat Characteristics

The peat characterisation studies concluded that the site comprises drained peatland across much of the site. These values have been used in calculations of volumes of peat across the site where the peat is present (e.g., >0.5 m probe depth).

### ***1.3.2.1 Drilling of Boreholes***

A total of 55 no. boreholes were drilled across TSB, including 24 no. boreholes within the redline boundary. Drilling within the redline boundary was focussed on areas at and downgradient of the proposed expanded landfill in order to collect detailed information about the lithology of the landfill expansion area, and to allow for permeability testing of the geological media in the same area.

The lithological information obtained from the 55 no. new boreholes supplements the 32 no. boreholes and more than 130 no. trial pits that were drilled and excavated as part of past investigations (as presented in the 2017 EIAR). The new lithological information also supplements the interpretations of geology from geophysical surveys that were conducted in 2002 and 2016 in support of the 2017 EIAR (Apex, 2016), as well as a peat probe survey that was conducted in 2006 (BRG, 2006).

The locations of the new drilled boreholes are shown on Figure 1-2 and summarised in Table 2-1. Those with prefix 'LF' were drilled in the landfill expansion area. The borehole logs are presented in Appendix 7-1 of the EIAR.

*Table 1-1: Summary of Boreholes Drilled for the Updated SI (2020-2021)*

| Borehole ID | Peg ID | Easting (ITM) | Northing (ITM) | Ground Level (m OD) | Total Depth (TD) |
|-------------|--------|---------------|----------------|---------------------|------------------|
| LFBH01      | LFBH01 | 674863.16     | 731746.89      | 83.250              | 10.00            |
| LFBH02      | LFBH02 | 674999.32     | 731715.05      | 83.002              | 7.00             |
| LFBH03      | LFBH03 | 674709.35     | 731680.95      | 82.278              | 7.00             |
| LFBH04      | LFBH04 | 674796.81     | 731650.00      | 83.818              | 14.50            |
| LFBH05      | LFBH05 | 674885.47     | 731603.23      | 84.507              | 7.00             |
| LFBH06      | LFBH06 | 675060.95     | 731634.31      | 83.961              | 7.50             |
| LFBH07      | LFBH07 | 674727.17     | 731540.43      | 83.959              | 8.50             |
| LFBH08      | LFBH08 | 675020.45     | 731554.60      | 84.557              | 10.00            |
| LFBH09      | LFBH09 | 675108.70     | 731516.64      | 84.510              | 10.50            |

| Borehole ID          | Peg ID  | Easting (ITM) | Northing (ITM) | Ground Level (m OD) | Total Depth (TD) |
|----------------------|---------|---------------|----------------|---------------------|------------------|
| LFBH10               | LFBH10  | 674791.96     | 731490.87      | 84.512              | 2.30             |
| LFBH10A <sup>2</sup> | LFBH10  | 674789.67     | 731488.17      | 84.736              | 8.80             |
| LFBH11               | LFBH11  | 674698.29     | 731368.60      | 84.249              | 6.00             |
| LFBH12               | LFBH12  | 675060.26     | 731353.28      | 85.782              | 7.00             |
| LFBH13               | LFBH13  | 675238.07     | 731741.02      | 84.185              | 7.00             |
| LFBH14               | LFBH14  | 675357.48     | 731697.23      | 85.130              | 8.50             |
| LFBH15               | LFBH15  | 675300.18     | 731401.22      | 85.282              | 8.50             |
| LFBH16               | LFBH16  | 675323.47     | 731430.02      | 85.712              | 12.40            |
| LFBH17               | LFBH17  | 675469.34     | 731257.12      | 86.119              | 17.50            |
| LFBR01               | LFBR01  | 675051.57     | 731682.63      | 83.898              | 18.00            |
| LFBR02               | LFBR02  | 675020.00     | 731405.41      | 85.361              | 25.70            |
| LFBR03               | LFBR03  | 674893.24     | 731346.47      | 84.873              | 21.50            |
| LFTB01               | LFTB01  | 674677.79     | 731752.04      | 83.012              | 12.50            |
| LW01                 | LFMW01  | 674610.18     | 731538.91      | 83.379              | 10.00            |
| LW02D                | LFMW02  | 674829.34     | 731265.87      | 84.853              | 13.00            |
| LW02S                | LFMW02B | 674820.57     | 731269.13      | 84.760              | 7.00             |
| MW01B                | WLMW01W | 675446.45     | 733547.55      | 85.300              | 25.50            |
| MW02B                | WLMW02W | 674319.35     | 731198.76      | 84.674              | 37.50            |
| MW02P                | WLMW02P | 674322.87     | 731213.62      | 84.743              | 3.00             |
| MW02Q                | WLMW02Q | 674323.89     | 731207.44      | 84.854              | 20.00            |
| MW03B                | WLMW03W | 673882.75     | 730795.54      | 84.060              | 19.50            |
| MW03P                | WLMW03P | 673878.04     | 730791.82      | 84.294              | 4.50             |
| MW03Q                | WLMW03Q | 673880.75     | 730793.72      | 84.150              | 9.00             |
| MW04B                | WLMW04W | 673695.13     | 730288.39      | 84.426              | 24.10            |
| MW04P                | WLMW04P | 673701.44     | 730308.42      | 84.423              | 4.50             |
| MW04Q                | WLMW04Q | 673697.44     | 730296.25      | 84.505              | 11.50            |
| MW05B                | WLMW05W | 674783.81     | 729202.74      | 85.665              | 27.00            |
| MW05P                | WLMW05P | 674781.19     | 729193.69      | 85.875              | 4.50             |
| MW05Q                | WLMW05Q | 674782.55     | 729198.25      | 85.588              | 13.80            |
| MW06B                | WLMW06W | 675049.20     | 732007.37      | 82.695              | 21.00            |
| MW06P                | WLMW06P | 675048.86     | 732006.48      | 82.681              | 3.00             |
| MW06Q                | WLMW06Q | 675047.90     | 732004.36      | 82.740              | 11.70            |
| MW07B                | WLMW07W | 675430.17     | 731615.73      | 86.592              | 18.00            |
| MW07P                | WLMW07P | 675430.19     | 731619.17      | 86.556              | 1.50             |
| MW07Q                | WLMW07Q | 675430.19     | 731617.00      | 86.548              | 6.00             |
| RW02P                | RWGW02S | 675222.79     | 730523.61      | 84.346              | 1.00             |
| RW02S                | RWGW02D | 675222.54     | 730513.98      | 84.340              | 13.00            |
| RW03P                | RWGW03S | 674288.38     | 730940.10      | 84.001              | 2.20             |
| RW03S                | RWGW03D | 674291.35     | 730936.25      | 83.959              | 10.00            |
| RW04P                | RWGW04S | 675099.16     | 731778.68      | 84.268              | 3.30             |
| RW04S                | RWGW04D | 675094.24     | 731780.42      | 84.339              | 13.00            |
| RW09A                | RWGW09S | 674309.21     | 731523.24      | 83.076              | 4.00             |
| RW09B                | RWGW09D | 674311.37     | 731527.80      | 83.003              | 10.00            |
| RW10P                | RWGW10S | 673760.86     | 731024.30      | 83.713              | 2.80             |

| Borehole ID | Peg ID  | Easting (ITM) | Northing (ITM) | Ground Level (m OD) | Total Depth (TD) |
|-------------|---------|---------------|----------------|---------------------|------------------|
| RW10S       | RWGW10D | 673768.50     | 731016.43      | 83.759              | 7.00             |
| WLPC01      | WLPC01  | 673781.25     | 731292.73      | 83.297              | 16.00            |

Note: <sup>1</sup> PSD = particle size distribution (grain size) analysis; <sup>2</sup>re-drill of LFBH10

The boreholes that were drilled in and downgradient of the landfill expansion area form two transects which are oriented roughly NW-SE and NE-SW across the area of interest. The selection of drilling locations was guided by:

- The aim of characterising the geology directly beneath the landfill expansion footprint and the new attenuation lagoon and ICW system (refer to Chapter 2 of the EIAR).
- The need to install monitoring wells in the landfill expansion area to obtain site-specific groundwater level and quality data.
- Physical access, whereby boreholes were drilled where ground conditions allowed within the bog, and existing tracks from past peat extraction activity were used.

All boreholes were drilled with either air rotary or sonic drilling methods. The sonic drilling method was applied for coring purposes, both through subsoils and into bedrock.

### ***1.3.3 Construction Activities Covered by Spoil/Peat Management Plan***

The overall layout of the proposed project is shown in Figure 2-1 of the EIAR. This figure shows the location of the Proposed Development site hardstanding areas, existing Drehid facility, temporary construction compounds, internal access roads and the main site entrance.

The entire landfill infrastructure will not be constructed at the same time and will be developed on a phased basis over a period of c. 25 years. The new landfill comprises 12 no. phases and it is anticipated that new landfill phases will be developed every 2 to 2.5 years.

Construction Stage 1 will comprise Phase 16 of the landfill (including undercell drainage system), the MSW Processing and Composting Building, the Maintenance Building, the Soils and C&D Processing Facility, contractor's yard, surface water management infrastructure and associated works.

Site layout drawings of the Proposed Development are included as Appendix 2-1 of the EIAR.

### ***1.3.4 Construction Activities covered by Peat Management Plan***

The Proposed Development is characterised by the following civil engineering works to provide the necessary infrastructure to complete the construction of a new waste treatment infrastructure to be co-located adjacent to the existing Drehid WMF as described in Chapter 2 of the EIAR:

- Construction of access roads to the Proposed Development site;
- Construction of temporary compounds, passing bays, car parking, hard stands, material storage areas and site offices;
- Landscaping and screening berms;
- Development of a new processing facility for the recovery of 70,000 TPA of inert soil & stones and C&D waste (rubble) and use of same for engineering and construction purposes within the site, including as engineering material in the landfill;

- Construction of a new odour abatement system in an extension to the existing composting facility including two emissions stacks to a height of 17m above ground level;
- Construction of a new odour abatement system as part of the new MSW Processing and composting facility including two emissions stacks to a height of 17m above ground level; and
- Development of a new maintenance building with staff welfare facility, office, storage and a laboratory.

## 2.0 PROPOSED MEASURES

This methodology includes procedures that are to be included in the construction phase to minimise peat excavations. The methodology is not intended to cover all aspects of construction such as drainage and environmental considerations.

The Principal Contractor will produce a detailed Method Statement identifying where and how excavated peat will be used in reinstatement or landscaping works. Specific requirements for the excavation, handling, storage and reinstatement of peat will be outlined in this Method Statement. The Principal Contractor will consider potential impacts on downstream receptors and the potential for instability issues with the excavated material.

Some of the requirements to be contained within this are outlined below. The majority of the site comprises drained peatland, mineral subsoil and rock. For founded roads, areas of peat within the footprint of excavation will have the top layer of vegetation stripped prior to construction by an experienced specialist contractor. Underlying peat or bare peat will then be removed.

Classification of excavated materials will depend on their identified re-use in reinstatement works. At this site it is anticipated that the material to be excavated will comprise peat and mineral subsoil. Peat management of the above construction activities are covered individually in this report.

The site is covered with thick glacial deposits resulting in local variations in topography. Post glacial peat overly the quaternary deposits. The peat across the area was previously drained for extensive peat harvesting.

A summary of the ground conditions encountered during the ground investigation carried out are given in Appendix 7-1 of the EIAR.

### 2.1 EMBANKMENT AREA

Peat reuse around and within infrastructure areas is an important aspect of the Proposed Development as it allows an opportunity to maintain the integrity of the excavated peat and enhance habitats. Any landscaping or road batters will be limited to the areas of ground already disturbed.

Peat material will be gradually excavated, in accordance with the construction sequencing set out in Section 3.1 of the CEMP, and loaded into suitable off-road dumpers, such as Moxy dumpers or similar. Access for the dumpers will be provided on stable ground using existing site materials or imported aggregate to create a safe working platform. The dumpers will remove peat from the works areas and deposit it at the locations of the environmental screening berms

surrounding the landfill. Vegetation will be cleared from the position of the screening berms prior to deposition of peat and silt fences put in place at the toe of the proposed embankments.

Reinstatement of vegetation will be focused on natural regeneration utilising peat vegetated turfs or hydroseeding. To encourage stabilisation and early establishment of vegetation cover, where available or other vegetation turves in keeping with the surrounding vegetation type will be used to provide a dressing for the final surface.

### 3.0 EXCAVATION AND STORAGE OF ARISING

It will be necessary to extract peat and subsoil on site as part of the construction phase. This will largely consist of areas of peat due to the nature of the site. The proposed area is covered with thick glacial deposits, resulting in local variations in topography. The majority of the site is located on relatively flat-lying areas, currently overlain by cutover peat bog.

Construction of the proposed infrastructure, and in particular the new landfill, will require significant earthworks to remove residual peat cover and excavate to the required formation levels. All remaining peat from the footprint of new infrastructure will be required to be removed and will be deposited at the perimeter of the Proposed Development to form a screening berm around the extended facility. The stripping of peat and creation of the berms will be carried out on a phased basis as the landfill footprint is gradually extended over a period of c. 25 years.

Prior to any excavations, the Principal Contractor will produce a detailed Method Statement identifying where and how excavated peat will be used in reinstatement or landscaping works. Specific requirements for the excavation, handling, storage and reinstatement of peat will be outlined in this Method Statement. The Principal Contractor will consider potential impacts on downstream receptors and the potential for instability issues with the excavated material. Allowing for receipt of a successful Grant of Planning in early 2024, site surveys and vegetation clearance will commence. Ecological surveys and obtaining a licence for archaeological testing will also be carried out in advance of peat excavations commencing.

Alongside vegetation clearance works, bog drains within the Proposed Development footprint will be blocked to prevent water draining into the active works areas and to divert surface water away from the construction footprint towards the diversion drains being installed outside the development boundary as part of the Timahoe South Bog rehabilitation works.

Following vegetation clearance and the installation of drain blocks, works will commence to remove peat from the works area. Peat stripping works, particularly in areas of deepest peat, will be planned for completion outside of winter months, where possible, when groundwater levels are naturally lower, and the working surface is drier. Peat stripping will commence in the south-western corner to allow construction of the ICW area and construction stage SWL (SWL 7). Some peat stripping will also commence in the footprint of Phase 16 so that subsoils can be removed for the construction of the SWL embankments and the compacted liner for the ICW. The surface water infrastructure will be developed first so that it can be brought into operation and construction stage surface water management can be routed through this infrastructure. To facilitate the construction of the ICW and construction stage SWL, any surface water run-off within the works area will be pumped into the surface water swale which runs around the perimeter of the existing landfill. This will ensure that construction stage waters are treated through the existing SWLs (SWL1 to SWL4) and the existing ICW prior to the proposed surface water management infrastructure being built. This is described further in the CEMP. Peat removal will be carried out until suitable bearing material is encountered.

As part of the construction of the Proposed Development, the existing bog drains which cross the infrastructure footprint will be removed. This will occur on a phased basis as part of site clearance, peat stripping and general excavations. As the large area occupied by the proposed landfill footprint will be constructed on a phased basis over the 25-year lifetime of the landfill, it is not necessary to remove the entire length of the drains at the outset. Working from the north-west end of the drains, they will be gradually blocked off using locally sourced peat and subsoils. The drain blocks will prevent water ingress into the construction areas and cause water levels in the subsoils and peat along the drain trajectories to rise.

Excavated peat will only be moved short distances from the point of extraction and will be reused for construction of environmental screening berms and landscaping at the facility. Screening berms will be 4-6 m in height and constructed on a phase basis with the development of the landfill. The berms will be planted with bands of native peatland tolerant woodland mix with remaining areas allowed to naturally revegetate over time, ensuring their stability. No peat will be removed off-site, and all peat materials excavated will be utilised within the Proposed Development site area. The peat will be trimmed back to a safe angle of repose, subject to temporary works assessment on site.

A summary is provided below with the combined volumes of calculated peat volumes requiring excavation on site to allow for development.

*Table 3-1: Peat and Subsoil Volume Summary*

| Volume Summary        | Peat Volume (m <sup>3</sup> ) |
|-----------------------|-------------------------------|
| Total Peat Removed    | 506,058                       |
| Total Peat Reused     | 500,115                       |
| Total Subsoil Removed | 747,855                       |
| Total Subsoil Reused  | 281,985                       |
| Net Peat Material     | 5,943                         |
| Net Subsoil Material  | 465,870                       |

### 3.1 GENERAL RECOMMENDATIONS FOR GOOD CONSTRUCTION PRACTICE

The recommendations of the PSRA are incorporated into this document and summarised below.

*Following application of mitigation measures, including consideration to the siting of infrastructure to minimise the risk, the findings of the planning stage PSRA indicate a “low” hazard ranking for instability related to the requirement for excavations on the site, subject to appropriate mitigation measures. Routine and common place mitigation measures will be put in place during the detailed design and construction of the scheme to reduce the likelihood of a failure. Required mitigation measures include stepping or battering back of excavations to a safe angle (as determined through a detailed slope stability assessment by a competent temporary works designer) or construction of a temporary sheet pile wall or rock fill berm to support the peat during construction. Following mitigation, the hazard ranking of the development is considered to be “low” for all areas. Further the site terrain is rolling and undulating and topographically confined, limiting the potential and scale of peat slide and debris runout distances. It is concluded that the site is suitable for the proposed project.*

#### 3.1.1 Construction Phase:

The following outlines an overview of the tasks for the construction phase:

- Client's Geotechnical Engineer to provide a Geotechnical Induction to all contractor supervisory staff.
- Client to appoint a Site Geotechnical Supervisor to carry out supervision of site works as required. The Site Geotechnical Supervisor will be required to inspect that works are carried in accordance with the requirements of the PSRA, identifying new risks and ensuring all method statements for works are in place and certified.
- Retain a Site Geotechnical Folder which contains all the information relevant to the geotechnical aspects of the site including but not limited to GRR, site investigation information, method statements etc.
- Contractor to develop a Method Statement for the works to be carried out in each of the PSRA areas cognisant of the required mitigating measures.
- Client's Geotechnical Engineer/Site Geotechnical Supervisor to approve the method statement.
- Contractor to provide tool-box talks and on-site supervision prior to and during the works.
- Daily sign off by supervising staff on completed works.
- Implementation of emergency plan and unforeseen event plan by the contractor.

### ***3.1.2 Operation and Maintenance Phase:***

The following outlines an overview of the tasks for the operation and maintenance phase:

- Communication of residual peat risk to appropriate site operatives.
- Ongoing monitoring of residual risks and maintenance if required. Such items would consist of regular inspection of drains and culverts to prevent blockages and inspections of specific areas such as settlement ponds and access roads after a significant rainfall event.

## **4.0 SUMMARY**

The total volume of excavated peat associated with the infrastructure footprint, associated excavated slopes and drains has been calculated at about 506,000 m<sup>3</sup>, predominately drained lowland raised bog in a cutover bog site. Peat will be excavated and reused in screening embankments on a phased basis as the landfill develops. The potential reuse of excavated peat has been calculated and will be reused entirely on site. There will be no export of peat off-site in accordance with the peat management guidelines.



## Appendix 4.3 – Dust Minimisation Plan

## APPENDIX 4-3 (DUST MINIMISATION PLAN)

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the following management plan has been formulated by drawing on best practice guidance from Ireland and the UK (IAQM (2014)).

### Site Management

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies.

At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 12.1 for the windrose for Casement Aerodrome). As the prevailing wind is predominantly north-westerly to south-westerly, locating construction compounds and storage piles downwind (to the east) of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed (UK Office of Deputy Prime Minister (2002), BRE (2003)). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials (USEPA, 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods where care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised;
- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;

- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein;
- At all times, the procedures put in place will be strictly monitored and assessed.

The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

#### Demolition

- Prior to demolition blocks should be soft striped inside buildings (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
- During the demolition process, water suppression should be used, preferably with a hand-held spray. Only the use of cutting, grinding or sawing equipment fitted or used in conjunction with a suitable dust suppression technique such as water sprays/local extraction should be used.
- Drop heights from conveyors, loading shovels, hoppers and other loading equipment should be minimised, if necessary fine water sprays should be employed.

#### Site Roads / Haulage Routes

Movement of construction trucks along site roads (particularly unpaved roads) can be a significant source of fugitive dust if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK Office of Deputy Prime Minister, 2002).

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved site roads;
- Access gates to the site shall be located at least 10m from sensitive receptors where possible;
- Bowers or suitable watering equipment will be available during periods of dry weather throughout the construction period. Research has found that watering can reduce dust emissions by 50% (USEPA, 1997). Watering shall be conducted during sustained dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use;
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.

#### Land Clearing / Earth Moving

Land clearing / earth-moving works during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust;
- During periods of very high winds (gales), activities likely to generate significant dust emissions should be postponed until the gale has subsided.

#### Storage Piles

The location and moisture content of storage piles are important factors which determine their potential for dust emissions.

- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles should be located downwind of sensitive receptors;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust. The regular watering of stockpiles has been found to have an 80% control efficiency (UK Office of Deputy Prime Minister, 2002);
- Where feasible, hoarding will be erected around site boundaries to reduce visual impact. This will also have an added benefit of preventing larger particles from impacting on nearby sensitive receptors.

### Site Traffic on Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads should be reduced to a minimum by employing the following measures:

- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- At the main site traffic exits, a wheel wash facility shall be installed if feasible. All trucks leaving the site must pass through the wheel wash. In addition, public roads outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.

### Summary of Dust Mitigation Measures

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed; and
- The specification of effective measures to deal with any complaints received.

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