

3 DESCRIPTION OF THE EXISTING ENVIRONMENT, ONGOING AND FUTURE ACTIVITIES

This section of the EIAR describes the existing facility and the licensed waste management activities which are carried out at the facility. The design and construction of the existing facility are outlined and a detailed description of the various elements of the ongoing authorised waste activities are presented. A description and schedule of the planned future waste activities at the existing facility are also outlined.

3.1 EXISTING SITE

3.1.1 Site Location

The overall Bord na Móna landholding comprises 2,544 hectares (ha) and is outlined in blue on Figure 1.1. The overall landholding is located within the 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 in County Kildare.

The existing permitted development area, to which this Existing Facility EIAR refers, is confined to an area of approximately 179 hectares (ha) principally including the existing MSW landfill mounds and the existing borrow pit areas. This facility is situated in the townlands of Timahoe West, Coolcarrigan, Killinagh Upper, Killinagh Lower, Drummond, Kilkeaskin, Loughnacush, and Parsonstown, as outlined in red on Figure 1.1.

The existing Drehid WMF operates in accordance with an IED Licence (W0201-03), issued by the EPA, and subject to planning approval for the facility. As noted in Section 1.1.1, an application for a new IED Licence is being made to the EPA to authorise waste activities at the existing permitted facility in addition to the proposed development works planned for the facility as outlined in Section 1.2 and detailed in the Proposed Development EIAR.

The existing Drehid WMF is situated approximately 4 km north of Allenwood, 9 km north-west of Prosperous, 9 km south of Enfield, County Meath and 12 km east of Edenderry, County Offaly. The landform of the general area is flat-lying to gently undulating topography of cut away peatland. Access to the Drehid WMF is from the R403 regional road via an existing dedicated site entrance and a 4.8 km internal access road from the regional road. The R403 lies south, southwest and west of the site. The R403 joins the R402 at Carbury to the northwest of the site. The R402 connects to the M4 while the R403 connects to central and south County Kildare.

3.1.2 Proximity of Housing and Centres of Population

Housing in the immediate area of the facility is relatively sparse and comprises predominantly single dwellings with adjacent farmyards and new bungalows. The nearest residential dwelling is located approximately 970 m from the existing MSW landfill and approximately 1,280 m from the existing

composting facility. The largest concentration of houses close to the existing facility is to the north west of the site, in the village of Derrinturn.

3.1.3 Land Use

The existing facility is located centrally within the overall Bord na Móna landholding. There is a planning permission in place for an MBT Facility which lies c. 700 m to the south of the existing MSW landfill mounds. Land use adjacent to the site is primarily disused cutaway bogland which was used for production of sod peat for energy generation up to 1993. Immediately adjacent to the existing facility site, there are areas of land where turbary, commercial forestry and agricultural usage are ongoing.

3.1.4 Traffic and Access

Access to the existing facility is via an existing site entrance at the R403 regional road and provides accessibility via a network of regional routes which in turn link with the National Motorway network. The R403 runs south, and southwest and west of the site. The R403 joins the R402 at Carbury to the northwest of the site. The R402 connects to the M4 while the R403 connects to central and south County Kildare. The M4 (Dublin to Sligo/Galway) motorway is located approximately 8 km to the north of the site, while the M7 (Dublin to Limerick/Cork) motorway is located approximately 18 km to the south of the site.

The speed limit along the R403 regional road, in approaching the site access, is 80 km/h. The R403 has an approximate carriageway width of 6.0 m in the vicinity of the site access, which is an adequate width for two Heavy Goods Vehicles (HGVs) to pass one another with 1.0 m clearance. A ghost island right turn lane junction has been provided at the site access which comprises a 3.0 m wide right turning lane and associated road markings. The 3.0 m wide through lanes are maintained in each direction. Visibility of 4.5 m x 160 m is available at the site access junction.

Figure 10.1 in Chapter 10 of this EIAR shows the existing facility in relation to the adjoining road network, including the national primary roads, regional and county roads and also the main towns and villages in the area.

3.1.5 Topography

A detailed topographical survey was carried out at the site in February 2016 by TOBIN Consulting Engineers. The output of this survey of the existing facility is presented as a topographic contour map in Drawing No. 10369-2000.

The existing facility is situated in relatively flat low-lying cutaway bogland with pre-development levels ranging from 84 m to 86 mOD. Whilst the topography throughout the overall landholding is also relatively flat at 80 to 90 mOD, screening of the site operations from the adjoining roads are provided by existing hedgerows and tree lines. The remote nature of the location of the facility footprint, lying approximately 0.8 km south of county road L5025, 2.7 km from county road L1910 and 3.3 km from regional road R403, provides considerable separation distances between the facility and adjacent roads.

These separation distances are enhanced by the growth of bog willow tree over several parts of the cutaway bogland and by dense hedge lines and commercial forestry to the east, south and west of the site.

3.2 DETAILS OF THE EXISTING FACILITY

The existing WMF at Drehid is regulated by the EPA in accordance with IED Licence Reg. No. W0201-03. The current IED Licence permits the following waste activities at the facility:

- Landfilling of non-hazardous residual waste up to 120,000 TPA; and
- Composting facility accepting up to 25,000 TPA.

The above waste activities are authorised at the facility until 2028 under the current IED Licence. The site layout is presented in Figure 3.1 and Figure 3.2 (aerial).

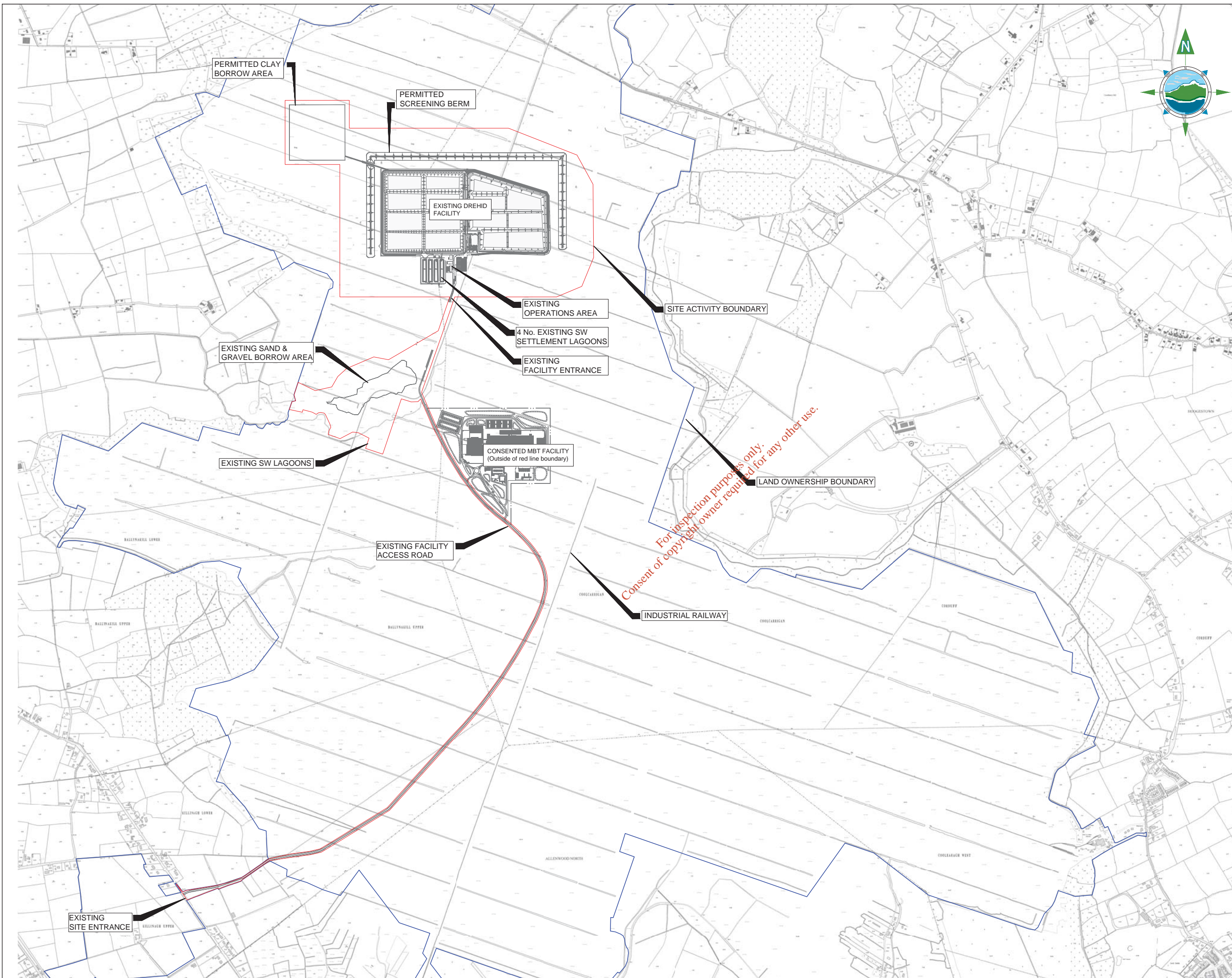
A detailed description of the ongoing and future activities at the WMF is provided in the following sections.

3.2.1 Non-Hazardous Municipal Solid Waste Landfill

The main waste infrastructure at the existing WMF is the non-hazardous MSW landfill which accepts material that has been subjected to treatment, including waste arising from the operation of recovery facilities. Planning permission was granted for the construction of the landfill in November 2005 and the landfill commenced accepting waste in February 2008. The permitted acceptance capacity of the landfill is currently 120,000 TPA and the end of life of the landfill is 2028. On the basis of the average density of material received at the landfill including cover material, this equates to capacity for c. 84,000 m³ per year of incoming MSW for the life of the facility.

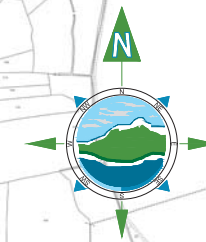
The landfill footprint (as shown in Figure 3.1 – Site Layout Plan and Figure 3.2 – Site Layout Plan (Aerial)) encompasses an area of approximately 39 ha and has an estimated total void space of 5,000,000 m³. This void space does not, however, allow for settlement of the waste which occurs over time. The entire MSW landfill comprises two separate landfill mounds and the mounds are sub-divided into 15 No. Phases for the purposes of construction, filling and capping. The westerly mound is comprised of 8 No. phases and the easterly mound is comprised of 7 No. phases as shown in Drawing No. 10369-2002 (Phasing Plan).

On average, the landfill is 15 – 20 m deep and the maximum final height, post settlement, of the landfill will be approximately 103.25 m above ordnance datum (mAOD) as in Drawing No. 10369-2003 (Capping Plan). The landfill cap is graded from this level at 1:30 to the side slopes of the landfill which will be constructed at a slope of 1:3. Sections through the landfill are provided in Drawing No. 10369-2004 and 10369-2005 (Landfill Mound Sections).



GENERAL LEGEND

BORD NA MÓNA OWNERSHIP BOUNDARY APPLICATION BOUNDARY



NOTES:

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

OSI 1:5,000 SERIES SHEET NO'S:
3187, 3188, 3253, 3254, 3318, 3319, 3381, 3382.

200m 0m 200m 400m 600m

Rev	Date	Description	By	Chkd.
A	July '18	EIAR	MN	RH

Client: **BORD NA MÓNA**
Naturally Driven

Project: **EXISTING DREHID WASTE MANAGEMENT FACILITY**

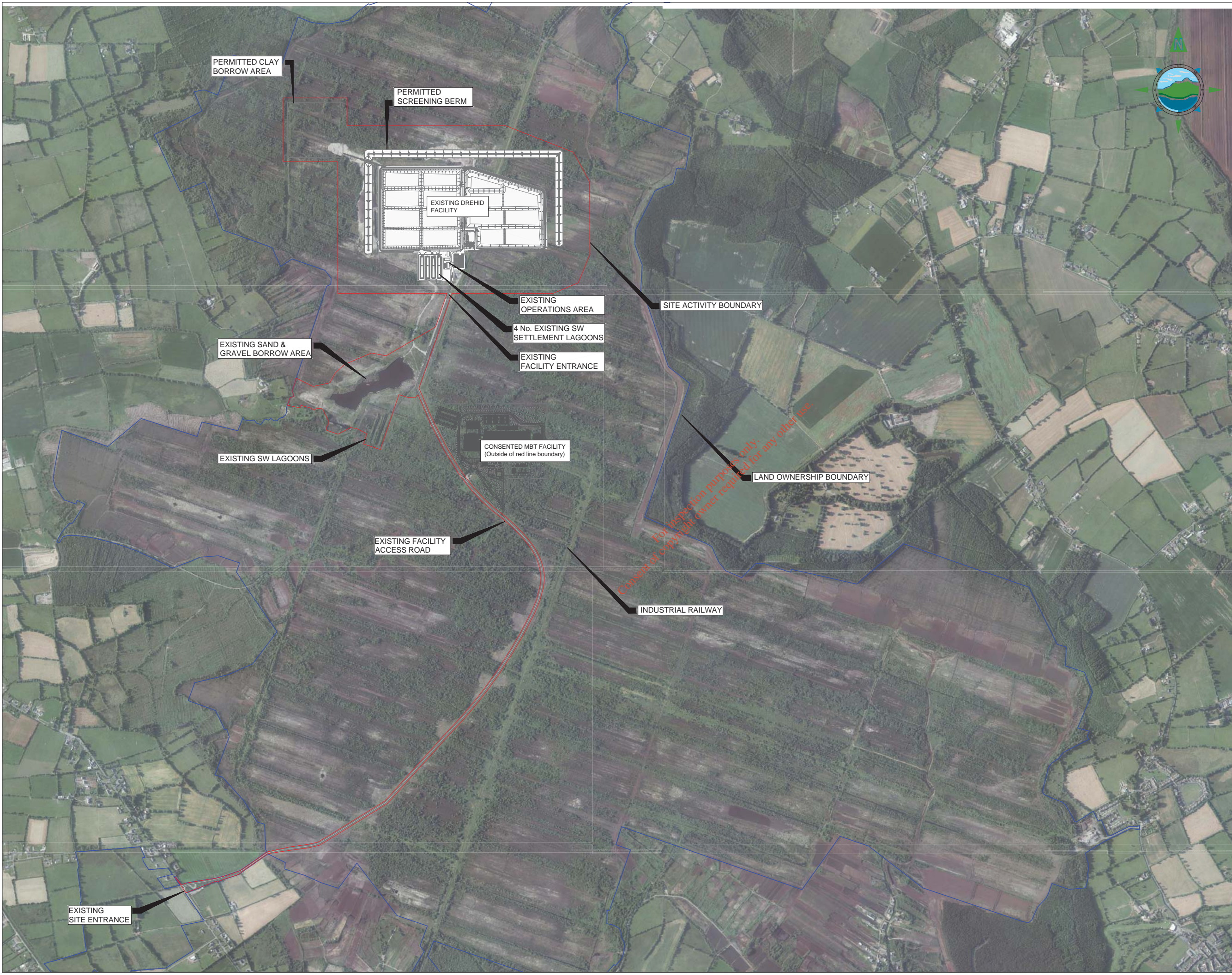
Title: **SITE LAYOUT PLAN**

Scale @ A3: **1:20,000**
Prepared by: M. Nolan Checked: R. Hunt Date: July 2018
Project Director: D. Grehan
Drawing Status: EIAR



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Drawing No.: **Figure 3.1** Revision: **A**



GENERAL LEGEND
 BORD NA MÓNA OWNERSHIP BOUNDARY APPLICATION BOUNDARY



- 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
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OSI 1:5,000 SERIES SHEET NO'S:
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Rev	Date	Description	By	Chkd.
A	July '18	EIAR	MN	RH

Client: **BORD NA MÓNA**
 Naturally Driven

Project:
 EXISTING DREHID WASTE MANAGEMENT FACILITY

Title:
 SITE LAYOUT PLAN AERIAL

Scale @ A3: 1:20,000
 Prepared by: M. Nolan Checked: R. Hunt Date: July 2018
 Project Director: D. Grehan
 Drawing Status: EIAR

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 Drawing No.: **Figure 3.2** Revision: **A**

3.2.1.1 Current Status of Landfilling Activity

As of November 2018, waste has been filled into 12 No. of the 15 No. phases of the landfill. Waste material is currently being deposited in Phase 12. The construction of the liner system for Phase 13 was completed in June 2018 and the Construction Quality Assurance (CQA) Report for the works was submitted to the EPA via EDEN in June 2018. Preliminary site preparation and sub-cell groundwater drainage works were completed for Phase 14 in June 2018, but no further construction works have been carried out to date.

A summary of the current status of the MSW landfill is presented in Table 3.1.

Table 3.1: Summary of Current Status of Landfilling Activity

Phase No.	Construction Completed	Commenced Waste Filling	Final Capping
1	January 2008	February 2008	2016
2	August 2009	August/September 2009	2016
3	January 2010	2010	2016
4	June 2010	2010	2016
5	January 2012	January 2012	
6	June 2013	June 2013	
7	September 2014	September 2014	
8	June 2015	June 2015	
9	November 2015	December 2015	
10	April 2016	2016	
11	October 2016	September 2016	
12	January 2017	May/June 2017	
13	June 2018		
14			
15			

The current activities at the landfill as of July 2018 are:

- Placement of geomembrane landfill cap and final layer of soil on part of Phase 5 and Phase 6;
- Installation of permanent landfill gas pipework and manifolds on part of Phase 5 and Phase 6;
- Placement of temporary plastic membrane on Phase 9, 10 and 11;
- Daily landfilling of waste at Phase 12; and
- Completion of site preparation works at Phase 14.

As reported in the 2017 AER, the constructed unused void space (excluding Phase 13) at the end of 2017 was approximately 236,031 tonnes of disposal capacity. In total, approximately 4,129,923 m³ of void space has been used up to the end of 2017.

3.2.1.2 Future Landfilling Capacity

Landfilling of waste in the MSW landfill will continue in accordance with the Conditions of the existing IED Licence for the facility until such time as a new IED Licence is issued to Bord na Móna for the facility, subsequent to which, the new Licence Conditions will be adhered to.

Table 3.2 outlines the planned timelines for construction and operational works at the facility from November 2018 onwards. It is noted that the below timelines are projected based on the current status of the waste industry and are subject to minor changes within the Conditions of the IED Licence in place at the time and the existing relevant planning permissions. It is noted that in accordance with Condition 3.7.1 of the IED Licence, Bord na Móna is required to provide notice to the EPA in advance of commencement of any Specified Engineering Works (SEW) at the facility which includes the construction of new landfill capacity. A summary of the previous SEW submissions made to the EPA are provided in Section 3.2.1.3.

Table 3.2: Summary of Future Landfilling Activity

Phase No.	Planned Construction	Planned Commencement of Waste Filling	Planned Final Capping
1			
2			
3			
4			
5			2019
6			2019
7			2019
8			2019
9			2020
10			2020
11			2023
12			2025
13		2019	2027
14	Q2 2020	2023	2030
15	2022	2025	2032

3.2.1.3 Specified Engineering Works

Condition 3.7.1 of the current IED Licence states that, “The licensee shall submit proposals for all Specified Engineering Works, as defined in Schedule D: Specified Engineering Works, of this licence to the Agency for its agreement at least two months prior to the intended date of commencement of any such work. No such works shall be carried out without the prior agreement of the Agency”.

Schedule D of the Licence lists the following activities as *Specified Engineering Works*:

- Development of the facility extension including preparatory works and lining;
- Final capping;
- Installation of Landfill Gas Management Infrastructure;
- Installation of Leachate Management Infrastructure;
- Installation of composting plant and air abatement system;
- Installation of ancillary Surface Water Management Infrastructure; and
- Any other works notified in writing by the Agency.

The previous SEW submissions made to the EPA are summarised in Table 3.3.

Table 3.3: Summary of Submitted Specified Engineering Works

SEW Report No.	Description	Date Submitted
SEW Report No. 1	Works proposed for Contract No. 1 – Site Development of the Drehid Waste Management Facility.	May 2006
SEW Report No. 2	Contract No. 2 – Site Development of Phase I of the Drehid Waste Management Facility.	December 2006
SEW Report No. 3	Works proposed for Contract No.3 – Continued Development of the Drehid Waste Management Facility and details of final capping and Phase No. 2 gas collection system.	June 2008
SEW Report No. 4	Installation of landfill gas management infrastructure	-
SEW Report No. 5	Works proposed for Contract No.4 – Continued Development of the Drehid Waste Management Facility.	March 2009
SEW Report No. 6	Works proposed for Contract No.4 – Continued Development of the Drehid Waste Management Facility – Stage I – Phase IV – V.	January 2010
SEW Report No. 7	Works proposed for the development of the composting plant and air abatement system.	June 2010
SEW Report No. 8	Proposed installation of landfill gas utilisation plant.	July 2011
SEW Report No. 9	Works proposed for Contract No.4 – Continued Development of the Drehid Waste Management Facility – Stage II – Phase 6 to Phase 8.	August 2011
SEW Report No. 10	Works proposed for Continued Development of the Drehid Waste Management Facility Phase 9 & Phase 10.	September 2012
SEW Report No. 11 (Capping SEW)	Works proposed for Capping of Phases I – VIII of the Drehid Waste Management Facility.	June 2013

SEW Report No.	Description	Date Submitted
SEW Report No. 11	Preparatory Works proposed for Development of the Drehid Waste Management Facility Phase 11 to Phase 12.	December 2015
SEW Report No. 12 (Landfill Gas)	General overview of the proposed full-scale landfill gas cleaning pilot plant in addition to an outline of the inputs and outputs of the pilot.	March 2015
SEW Report No. 12	Development Works proposed for Phase 11 & 12 and both Preparatory and Development Works for Phases 13 to 15 at the Drehid Waste Management Facility.	April 2016
SEW Report No. 13	Preparatory and Development Works for Phases 13 to 15 at the Drehid Waste Management Facility.	September 2017
SEW Report No. 14	Drehid Waste Management Facility – Permanent Use of Reverse Osmosis.	July 2016
SEW Report No. 14 (RFI)	Drehid Waste Management Facility – Permanent Use of Reverse Osmosis. (Response to RFI).	February 2017
SEW Report No. 15	Specific alterations to the layout of the leachate recirculation system to optimise the system and provide additional protection and control in the system.	January 2017

3.2.2 Waste Composition

The waste types accepted at the existing facility are outlined in Table 3.4 and are in accordance with Schedule A of the IED Licence.

Table 3.4: Waste accepted at the Existing Facility

Waste Type	Description	Receptor
Non-hazardous municipal, commercial and industrial wastes	Household, commercial or industrial waste which has been subject to pre-treatment to remove biodegradable content.	Landfill
Inert waste	Inert construction and demolition waste and glass.	Landfill
Source segregated bio-waste or organic fines	Household, commercial or industrial waste of an organic or putrescible character.	Composting Facility

3.2.3 Site Infrastructure

This section details the site infrastructure in place at the existing facility. The site layout is shown in Figures 3.1 and 3.2 and a detailed facility layout is shown in Drawing No. 10369-2001.

3.2.3.1 Site Access

Access to the facility is via existing site entrance, located on the R403 regional road. An existing 4.8 km access road links this entrance to the licensed facility location and all traffic accessing the facility use this private road.

Signage is erected at the site entrance and along the site access road to direct employees and visitors to the designated car parking areas and waste collection/delivery vehicles to the relevant areas of the facility. There is also extensive signage notifying drivers of the speed limits on the site which are 50 km/h on the facility access road and 15 km/h within the facility.

3.2.3.2 Site Security

Site security arrangements to prevent unauthorised access to the existing facility include the following:

- The existing entrance from the R403 regional road has secure fencing, stonewalls and pillars (2.4 m high fencing and a 7 m wide electric drive cantilever security gate that is closed outside of normal operating times);
- Post and chain link fencing is erected around the entire boundary of the facility with the exception of the facility entrance as described above;
- A CCTV system monitors the existing access from the R403 regional road and the infrastructure associated with the existing facility; and
- Anti-intruder alarms are installed on all lockable facility buildings.

In addition to the above, site signage relating to the Drehid WMF indicating opening times and contact details is erected at the site entrance. The site security infrastructure is checked daily by staff and any damage is reported immediately to facility management. Where possible, temporary repairs are carried out immediately with permanent repairs targeted for completion within 48 hours of discovery.

All visitors to the facility are required to sign in and out at the administration building.

3.2.3.3 Traffic Control

All traffic accesses the facility by turning from the R403 regional road into the existing site entrance and travelling along the access road to the waste facility. This is the only access to the waste facility. Traffic management to and from the existing facility is discussed in more detail in Chapter 10 (Material Assets (Roads and Traffic)) of this EIAR.

Given the length of the access road from the R403 (4.8 km), there is no possibility of traffic on the R403 regional road being affected by vehicles queuing to enter the existing facility. All waste vehicles, having entered the facility entrance gate and travelled along the internal access road will travel to the Waste Control Area at the location shown on Drawing No. 10369-2001, where the weight, source, type etc. of the incoming waste is recorded and instructions given as to where the vehicle may proceed to with the waste. Access to the incoming and outgoing weighbridges and to the landfill and composting facilities within the site is controlled by the security barriers, which operate a vehicle number plate recognition system.

Signage is positioned strategically to direct users to the relevant locations within the facility in a proper manner. Car parking for 22 No. cars is provided adjacent to the Welfare Building as shown in Drawing No. 10369-2001 with additional space available for parking small site vehicles.

3.2.3.4 Waste Control Area and Weighbridges

All waste vehicles entering the facility are required to wait until directed to enter the Waste Control Area and incoming weighbridge. The approach to the Waste Control Area is controlled by a traffic light system which is managed by the weighbridge operator. When directed, the incoming waste vehicles drive onto the incoming weighbridge for document processing and the driver is subsequently directed to the appropriate location within the facility.

Two proprietary weighbridges, one to weigh incoming vehicles and the second to weigh outgoing vehicles, each capable of weighing and recording up to 60 tonnes are provided in the Waste Control Area. The weighbridge operator is located in a weighbridge kiosk located in between the incoming and outgoing weighbridges. Both weighbridges are linked to the weighbridge kiosk and utilise proprietary software to allow for the recording of details of each waste movement into and out of the facility including:

- Haulier name;
- Vehicle registration;
- Waste source;
- Waste type (EWC/LoW Code);
- Laden weight; and
- Empty weight

The weighbridges are necessary to allow for the free-flow of vehicular traffic and to ensure efficient turnaround times at the facility. Entry control barriers are provided at the two weighbridges and regular calibration of the weighbridge load cells is carried out.

3.2.3.5 Maintenance Building

The maintenance building is located adjacent to Phase 1 of the landfill as shown in Drawing No. 10369-2001. The maintenance building provides all necessary facilities required for the operation and maintenance of the existing facility. This building provides a dedicated location for maintenance and repair of mobile site equipment, such as excavators and dump trucks. The maintenance building is constructed as a steel portal framed structure with external cladding and roller shutter doors. Internally the floors are reinforced concrete. This building is fitted with secure storage areas to accommodate power tools, other small plant and equipment and includes a service pit and overhead gantry for maintenance works. A proprietary bunded container, compliant with EPA requirements, is provided for the storage of hydraulic and engine oils. The building is supplied with 3-phase power supply and is fitted with security and fire alarm systems. The building also includes an office and a store room.

The maintenance building also houses welfare facilities for site staff which includes storage, an employee canteen and first aid facilities.

The maintenance and welfare facilities include all necessary provisions required for the operation and maintenance of the facility in accordance with Safety, Health and Welfare at Work Legislation and other legal requirements.

3.2.3.6 Administration Building

The administration building is located close to the maintenance building as shown in Drawing No. 10369-2001 and includes:

- Facility manager's office;
- Assistant facility managers office;
- Administration office;
- Foreman's office;
- Conference/meeting room;
- Laboratory;
- Store rooms and telemetry room;
- Canteen; and,
- Toilets, showers and changing rooms.

The conference/meeting room in the administration building is also used for the provision of a public education area for environmental education needs. Poster presentations and literature on waste management and on the workings of the landfill are available in this conference/meeting room. Provision is also made for the inspection of the IED Licence and AERs in this room.

3.2.3.7 Laboratory Facilities

A small laboratory is provided in the administration building which allows for the carrying out of the routine monitoring requirements at the site including landfill gas and leachate analyses. Groundwater and surface water analyses are carried out on a periodic basis in compliance with the IED Licence requirements. Basic parameters (e.g. dry solids, volatile solids, pH) for process control measures for the composting facility are also measured in this laboratory. A stove and a small oven for drying samples are provided. Portable instruments such as a landfill gas analyser, pH and temperature meters, a conductivity meter etc. are retained on-site in the laboratory.

The full suite of analyses for groundwater or surface water is not carried out at the site laboratory. An external, accredited laboratory carries out the analysis of samples required under the IED Licence conditions.

3.2.3.8 Wheel Wash

A wheel wash is provided at the location shown in Drawing No. 10369-2001. The wheel wash is located to ensure that waste vehicles leaving the facility do not carry excess waste onto the site access road or adjoining road infrastructure.

The wheel wash has a self-contained water recirculation system. A tank stores water for washing purposes while a pump re-circulates the water back into the tank during washing. Solids that settle at the base of the tank are removed by a vacuum tanker. Water is only discharged to the foul water system during the periodic replenishment of the used process water with fresh water.

3.2.3.9 Fuel Storage

There is a bunded fuel storage area located adjacent to the maintenance building as shown in Drawing No. 10369-2001 which provides fuel required for the on-site plant and equipment.

This bunded fuel storage area is roofed and comprises a proprietary diesel tank with a capacity of 20,000 litres (20 m³) and a 5,000 litre (5 m³) kerosene tank located in a bund with a total capacity of 30 m³.

3.2.3.10 Waste Quarantine Area

A waste quarantine area is provided in combination with the waste inspection area as shown in Drawing No. 10369-2001. The floor of the waste quarantine area slopes towards an Aco drain that is connected to the foul water system. A 1.5 m high reinforced concrete wall on three sides surrounds this bunded area.

3.2.3.11 Waste Inspection Area

The waste compactor operator carries out visual inspection of all loads entering the facility at the working face of the landfill. The facility manager and facility supervisor also carry out periodic inspections at the working face, particularly in the case of suspect loads, which may then be diverted to the waste inspection area.

Potentially non-compliant loads entering the landfill are tipped at the waste inspection area and inspected by the facility manager. If the load is non-compliant then the waste contractor is required to remove it off-site. Compliant loads are reloaded by utilising Bord na Móna waste handling plant on-site and deposited at the working face of the landfill.

A bunded waste inspection area in combination with the waste quarantine area is provided as shown in Drawing No. 10369-2001. A 1.5m high reinforced concrete wall on three sides surrounds this bunded area.

3.2.3.12 Site Roads, Parking and Hardstanding

Roads and parking areas are constructed mainly using bituminous macadam pavements. The access road, site roads and car parking at the administration building are constructed using bituminous macadam pavements. Concrete hardstand areas are provided at the waste inspection and quarantine areas, waste

reception areas and fuel storage area. A concrete pavement is used on a short section of road in between the two landfill mounds where incoming waste vehicles access the landfill face.

Drainage from the hardstanding areas is pumped/drained to the surface water collection system, via oil interceptors.

3.2.3.13 Water Supply

The water supply provision for the existing facility is outlined in Table 3.5.

Table 3.5: Water Supply Provision

Water Requirement	Source
Potable water	Bottled water dispensers
Domestic non-potable water requirements (i.e. toilets, sinks etc.)	On-site borehole
Fire-fighting requirements	On-site attenuation lagoons, with back-up from on-site borehole
Process water requirements (non-potable) for composting facility	Rainfall run-off from compost facility roof, with back-up from on-site lagoons and on-site borehole
Water required for cleaning, wash-down and other operational requirements such as dust suppression	On-site attenuation lagoons and on-site borehole

Water supplied from the on-site borehole is pumped to the site infrastructure for the above uses. Due to the potential for high ammonium, iron, manganese and metals within the underlying aquifer, a treatment system would be required to meet the required drinking water standards.

The peak water demand for fresh water for the existing facility is currently 6 - 7 m³/day. Water from the attenuation lagoons is used for firefighting purposes and for process water requirements. A dedicated fire water main is in place at the facility and fire hydrants, to comply with the requirements of the Building Regulations, are located on this fire water main.

3.2.3.14 Surface Water and Foul Water Infrastructure

A grit interception trap and oil interceptor are installed through which intercepted run-off from hardstanding and parking areas within the site is diverted. The outfall from the grit trap and oil interceptor is discharged to the surface water attenuation lagoons for further treatment. Surface water from lined but unfilled landfill cells and run-off from capped areas divert to the surface water settlement lagoons. These lagoons are sized to provide adequate capacity for surface water run-off, to meet facility fire-fighting water requirements and to provide water for the composting facility. Overflow from the attenuation lagoons is diverted through integrated constructed wetlands (ICWs) to provide an additional step in the treatment train. From here the surface water run-off is diverted to a further settlement lagoon prior to discharge into the Cushaling River towards the western boundary of the site.

Run-off from the roof of the composting facility is diverted to the process water tank in the composting facility. Further detail on surface water management at the facility is provided in Chapter 7 (Water).

Foul water sources at the existing facility are:

- Wastewater from sanitary facilities;
- Overflow water from the wheel wash;
- Run off from the waste reception areas; and
- Leachate from the landfill.

Sanitary wastewater (i.e. wastewater from toilets, washing facilities, kitchens etc.) is collected in the administration and maintenance buildings and drained via 100 mm diameter PVC pipe to a proprietary wastewater treatment system and then pumped to the leachate holding tanks for transport off-site to an appropriate wastewater treatment plant (WWTP). As described in Section 3.2.4.8, the wheel wash has a self-contained water recirculation system and water is only discharged to the foul water system during the periodic replenishment of the used process water with fresh water. Run-off from the compost facility reception area and leachate from the landfill are discussed in more detail in the following section.

The waste water collection system will be fully isolated from the surface water collection system during the lifetime of the facility.

Integrity testing was carried out on the surface water and foul water underground lines in Drehid in 2017. A number of defects were identified on the surface water line which required remediation. A summary of these defects was submitted to the EPA in December 2017. There were no defects noted on the foul line. The repair of the defects was completed in Q1 2018. The Underground Line Reports are on file at the existing facility and are available to the EPA for inspection at any time.

3.2.3.15 Leachate and Process Waste Water Infrastructure

Leachate/process waste water is generated from the MSW landfill and the composting facility. The leachate and process waste water systems are described as follows:

- Leachate collection system from the filled and active MSW landfill cells which is diverted to the leachate holding tanks via a 110 DN pipe and subsequent transport off-site; and
- Process effluent system which collects leachate generated in the composting building which is recirculated into the composting process.

Further detail on the leachate collection infrastructure in each phase of the landfill is provided in Section 3.2.1.4.

Wastewater generated in the composting facility is re-circulated back into the composting process. Leachate and condensate from the tunnels and post-composting areas, together with any run-off from hardstand areas (e.g. through cleansing) is collected in two leachate/wash water tanks. From there, it is

pumped through a mechanical filter, retaining particles in the water, where it is then re-circulated into the composting tunnels and post-composting area. An access chamber and collection sump is provided as a contingency measure in each of the leachate/wash water tanks, which allows for the pumping of surplus wastewater to the leachate holding tanks and subsequently transported off-site to an appropriate WWTP.

As reported in the AER for the facility, the tonnage of leachate and foul water taken off-site in 2017 was c. 40,189 tonnes. The leachate was directed off-site for treatment at the Leixlip WWTP in County Kildare, Ringsend WWTP in County Dublin and licensed/permitted waste facilities operated by Enva.

3.2.3.16 Other Services

Other services that are provided at the existing facility include:

- Telephone system;
- 400v three phase electricity;
- A standby diesel generator;
- Standby pumps;
- Gas detection systems in the site buildings; and
- Meteorological station.

3.2.3.17 Building Ventilation and Odour Abatement System

The composting facility includes a building ventilation system and an odour abatement system. The function of the building ventilation system is to provide a specified number of air changes per hour and to maintain a negative air pressure environment within the building. The maintenance of a negative pressure environment within the building prevents the emission of untreated air thereby minimising potentially nuisance causing odour emissions. The provision of air changes within the building also provides appropriate working conditions for plant operators.

The odour abatement system treats the air extracted by the building ventilation system and the process air exhausted by the composting process. The core components of the odour abatement system include acid scrubbers, humidifiers and biofilters and are described in more detail in Chapter 11 (Air Quality).

3.2.3.18 Fire Control System

A number of fire control features are provided at the existing facility. These include fire alarms, fire water supply from the surface water settlement lagoons, fire water main and fire water hydrants. In addition, the following fire control measures are implemented:

- Control of incoming waste vehicles to ensure that no burning or smouldering loads enter the facility;
- All site operatives and employees are trained in fire prevention, control and emergency response procedures;

- Emergency response contact numbers (Fire Service, Gardaí, Ambulance and other agencies) are posted in prominent locations;
- Automatic communication of fire alarms to mobile phone numbers of assigned responsible individuals;
- Fire extinguishers, smoke detectors and fire alarms are provided in all facility buildings;
- A water bowser is available to deal with any small fires within the facility; and
- Smoking is only permitted at designated locations within the facility.

In the event of a fire at the facility, firewater run-off will be collected within the surface water lagoons. This firewater will subsequently be analysed prior to tankering off-site to an approved WWTP where required.

The emergency assembly point for the facility is located in the car park in front of the administration building.

3.2.4 Construction Activities

All proposed engineering activities at the existing facility are notified to the EPA as SEWs in accordance with Condition 3.7.1 of the facility IED Licence, as detailed in Section 3.2.1.3.

In order to provide assurance that the SEWs are constructed in accordance with the intended design and technical specifications, construction quality control procedures are put in place. These procedures ensure that materials and workmanship meet defined specifications and include the integrity testing of all landfill lining systems, surface water, foul water, process water pipe work and underground structures in accordance with industry accepted standards and procedures. All integrity testing is inspected and witnessed by a Bord na Móna Engineer or Consultant Engineer acting on Bord na Móna's behalf. Integrity test certificates are 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 works and prior to the acceptance of waste, a Construction Quality Assurance (CQA) Report is prepared by a third party in accordance with the requirements of Condition 3.7.3 of the IED Licence.

3.2.5 Operational Phase

3.2.5.1 Hours of Operation

In accordance with Condition 1.5 of the IED Licence, the existing facility is permitted to accept waste for disposal at the landfill only between the hours of 08.00 and 18.30 Monday to Saturday inclusive. The hours of operation are permitted as between 08.00 and 19.00.

Various processes at the facility operate on a continuous basis (24 hours per day and 7 days per week) and are fully automated outside the hours of operation. Such processes include the composting process, reverse osmosis plant (as required) and landfill gas utilisation process.

The facility only operates outside these hours when required to cater for the later arrival of refuse vehicles due to breakdown or other exceptional circumstances. Waste that is accepted at the composting facility

at or near closure of operating hours will be unloaded in the acceptance area and stored overnight and handled during the next working day.

3.2.5.2 Plant and Equipment

Mobile plant and equipment is employed on-site for composting activities and placement of waste in the landfill. The plant and equipment utilised is summarised as:

MSW Landfill

- 1 No. waste compactor
- 1 No. bulldozer
- 1 No. tracked excavator for placing waste in landfill

Compost Facility

- 2 No. loading shovels
- 1 No. tractor/trailer unit for depositing biostabilised material in landfill

Plant Common to All Areas

- 1 No. road sweeper
- 2 No. water bowsers
- 1 No. tractor
- 1 No. wheeled excavator
- 1 No. diesel pump
- 1 No. standby generator

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3.2.5.3 Waste Acceptance Procedures

Waste is only accepted at the Drehid WMF from customers who are holders of a waste collection permit, unless exempted, under the Waste Management (Collection Permit) Regulations (S.I. No. 820 of 2007) and amending Regulations. The facility does not accept waste delivered directly by the general public and there is no civic amenity facility provided at the site.

Waste haulage contractors using the facility are required to have a pre-agreed contract with Bord na Móna and the site waste acceptance procedure applies to all waste deliveries to the site. This ensures that all contractors are assessed in advance to ensure their compliance with relevant waste management legislation and that the general composition of the waste is known prior to delivery. Any contractors who arrive on-site without such a contracted agreement are refused entry and turned away.

The waste contractor/carrier is required to provide documentation, which allows a written record to be maintained for each load of waste arriving at the facility. The following information is recorded:

- the date;
- the name of the carrier (including, if appropriate, the waste collection permit details);
- the vehicle registration number;
- the name of the producer(s)/collector(s) of the waste as appropriate;
- the name of the waste facility (if appropriate) from which the load originated including the waste licence, IED licence or waste permit registration number;
- a description of the waste including the associated EWC/LoW codes;
- the quantity of the waste recorded in tonnes; and
- the pre-treatment, where applicable, to which the waste has been subjected.

Bord na Móna also record the following information:

- the name of the person checking the load; and
- where loads or wastes are removed or rejected, details of the date of occurrence, the types of waste and the facility to which they were removed.

Three levels of testing and compliance are required for the acceptance of material based on EC Council Decision 2003/33/EC, namely:

- Level 1: Basic Characterisation;
- Level 2: Compliance with Basic Characterisation (i.e. consistency testing for regularly generated wastes); and
- Level 3: On-site Verification.

Table 3.6: Testing Requirements

Testing Level	Responsibility	Objective
Level 1: Basic Characterisation	Waste Producer	Full understanding of the waste.
Level 2: Compliance with Basic Characterisation (i.e. contingency testing for regularly generated wastes)	Waste Producer	Periodic sampling to demonstrate consistency with original understanding of a regularly generated waste (i.e. the basic characterisation) using key characteristics. For singularly produced waste streams, Level 2 testing is not required.
Level 3: On-site Verification	Landfill Operator	Consistency/compliance with basic characterisation for visually non-conforming waste and 'quick check' of key relevant characteristics where appropriate.

Following satisfactory documentation check and initial on-site verification of authorised vehicles at the waste control area, vehicles are directed to the appropriate location within the facility. While unloading,

the waste is subject to further visual inspection by site staff. Should any unacceptable wastes be discovered, the load or any relevant part thereof is removed to the waste inspection area for further investigation. If the non-conformity has been identified after unloading the waste, the waste is loaded back on the truck and held in the waste inspection area.

If a load has been rejected while still contained, the truck or trailer is moved into the waste quarantine area in agreement with the carrier. In the case that the non-conformity is only related to wrong or incomplete documentation, the truck may be held until it is in order. In the event the waste is found to be non-conforming, the waste will either be reclassified and disposed of appropriately or removed from the site by the carrier. The carrier is required to notify Drehid WMF of the final destination of the waste load.

In accordance with Condition 8.1.10 of the IED Licence, a Waste Acceptance Procedure has been submitted to and agreed with the EPA outlining further details of the above.

3.2.5.4 Waste Handling

Waste is deposited close to and above the advancing tipping face. Site operatives inspect the deposited waste for items that are not acceptable under the IED Licence, such as tyres, gas bottles, batteries, WEEE etc. These are removed and stored in appropriate areas for later removal from the site.

The deposited waste is then spread in shallow layers on the inclined surface and compacted. Steel-wheeled compactors operate on the gradient of the shallower face, pushing and compacting thin layers of waste. Each day's waste input forms a 'block' which is compacted and covered. The maximum area of the working face of the landfill is 25 m long and 25 m wide. The following day a new 'block' of waste is deposited adjacent to this block. This allows areas that have been filled and are to be left for a period, to be progressively restored over the site life, minimising the areas of active waste deposition. The level areas of the working face are covered on a continuous basis during the day. The slope of the working face is covered completely at the end of each working day.

3.2.5.5 Site Management Structure

The day to day management of the facility and supervision of waste activities are the responsibility of the entire management team, including the Facility Manager, Landfill Operations and Construction Supervisor, Composting Plant Operations and Maintenance Team Leader, EHS Officer and the General Operatives. The site organisational chart (submitted as part of the 2017 AER for the facility) is shown below.



DREHID FACILITY MANAGEMENT STRUCTURE

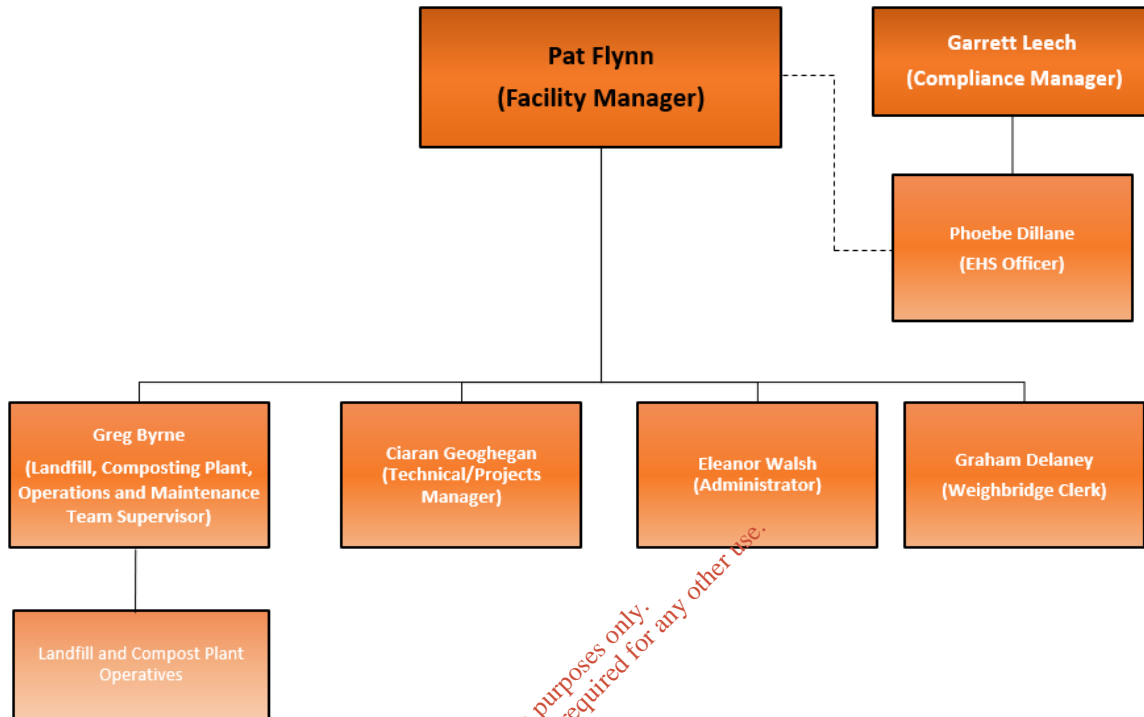


Figure 3.3: Drehid WMF Organisational Chart

3.2.5.6 Raw Materials and Energy

Details of the 2017 raw materials and energy consumption at the facility are presented in Table 3.7.

Table 3.7: Raw Materials and Energy Usage for the Operation of the Existing Facility

Material/Resource	Annual Usage (2017)	Amount Stored On-Site
Engine, gear and hydraulic oil	1,500 litres	500 litres
Electricity (including road entrance, landfill, composting facility and gas plant)	4,124 MWhr	Not Stored
Kerosene	4,501 litres	5,000 litres
Diesel (green)	340,285 litres	20,000 litres
Water (Domestic requirement)	618 m ³	Potable water from imported water cooler bottles. Other non-potable water supplied from on-site borehole.
Water (Process and operational requirements)	1,000m ³	On-site borehole and surface water attenuation lagoons.

3.2.5.7 Outputs from the Existing Facility

The existing facility accepts non-hazardous municipal waste for landfilling and organic waste material for composting. The only output from the existing facility activities is the biostabilised output from the composting facility which is disposed of in the existing landfill. The composting facility output for 2017 is presented in Table 3.8.

Table 3.8: Annual Outputs from the Existing Facility

Output Type	Tonnage	Destination
Compost Facility – biostabilised waste including oversize material and rejects	17,500	MSW landfill for disposal
Compost Facility – composting process losses	7,500	-

Bio-stabilised waste produced from the treatment of organic fines meets the EPA's stabilisation requirement (as set out in the IED Licence Schedule C.5) where stabilisation means the reduction of decomposition properties of the waste to such an extent that offensive odours are minimised and that the respiration activity after four days is less than 7 mgO₂/gDM thereafter.

3.2.6 Nuisance Controls

3.2.6.1 General

The operation of the existing facility is carried out in compliance with the IED Licence for the Drehid WMF issued by the EPA (W0201-03). The conditions of the IED Licence include measures to minimise or prevent nuisance to the public occurring as a result of the operation of the facility. A Complaints Register, detailing any complaint received from the general public in respect of the operation of the facility, is maintained at the site and reporting annually in the facility AER. The following sections detail the nuisance control measures that are undertaken at the site.

3.2.6.2 Litter Control

The following measures will be employed at the site to control litter:

- All waste entering the facility is required to be in covered vehicles. Bord na Móna will exclude any contractor failing to comply with this requirement from entering the site;
- All waste processing required for the compost facility takes place in fully enclosed buildings;
- The approach roads to the facility are monitored on at least a daily basis and in the event of litter being found on these roads, site staff promptly remove it and deposit it in the appropriate manner at the facility;
- General clean-up and attendance work is carried out when required by site staff around the entire perimeter of the overall WMF footprint, on all internal access roads and on the approach roads;

- Litter is controlled by fencing which is installed around the landfill footprint as specified in the IED Licence. Portable litter fencing is also used at the landfill working face, which can be moved to various points around the working face depending on the wind direction;
- All waste is stored in a building or bunded area, with no waste to be stored in external undesignated areas; and
- All site areas are inspected and cleaned regularly.

Bord na Móna has also prepared a Dust and Litter Control Plan which is included as Appendix 3.1.

3.2.6.3 Vermin Control

It is recognised that badly managed waste management facilities sites have the potential to attract vermin such as rats and flies. Strict control procedures have been put in place at the Drehid WMF to control the population of vermin.

- The composting process takes place within a completely enclosed building. All plant, equipment and tipping areas are cleaned regularly;
- A detailed Vermin Control Plan has been developed by Bord na Móna as part of the Environmental Management Plan for its waste management facilities and is in place at the Drehid WMF. This Plan incorporates the following elements:
 - A site map showing the positions and numbers of each bait point;
 - 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;
 - Inspection records for the bait points which describe any signs of vermin and highlight any vermin attractions on-site;
 - The facility manager is responsible for acting on the findings of the monthly inspection records; and
 - A vermin control manual containing the bait point location maps, product details/specifications for the baits used and the monthly inspection records is maintained and kept at the facility.

A firm of professional vermin control experts are engaged to implement the Vermin Control Plan. Baiting is undertaken in a professional manner and every precaution is taken to avoid non-target species. The bait is placed in areas which are not accessible to non-target species and, where possible, dead or dying vermin are removed as soon as possible. It should be noted however that vermin, such as rats, normally return to their nests to die.

3.2.6.4 Odour Control

Measures that are implemented at the existing facility to eliminate or minimise nuisance odour emissions include:

- All aspects of the composting process are undertaken in fully enclosed buildings;

- All waste delivered to the facility is in covered/enclosed vehicles;
- Doors at the waste reception area of the composting facility are rapid closing doors, with an opening or closing time of approximately 20 seconds;
- The core composting process is undertaken in fully enclosed concrete composting tunnels located within an enclosed building - thereby providing double containment features;
- Air streams with a potential for high ammonia levels are treated in an acid scrubber prior to biofiltration;
- A Landfill Odour Management Plan has been prepared for the facility and is revised in accordance with ongoing activities at the landfill. The latest version of the LOMP (Rev 4 dated 22 March 2018) is included as Appendix 3.2;
- Specific measures carried out to minimise odour generation at the landfill face includes compacting the waste within 3 to 4 minutes of the waste being unloaded at the working face. The level area is covered on a continuous basis during the day and the slope of the working face is covered completely at the end of each working day;
- 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 are texted to selected mobile phones numbers thereby ensuring the communication of critical alarms to responsible individuals on a 24-hour basis;
- Good housekeeping practices (internally and externally) and a closed-door management strategy are maintained at all times;
- Biofilters are compartmentalised to facilitate maintenance and replacement of media;
- Each biofilter comprises two sections such that treatment can be provided by one of the sections while the other section is being maintained;
- Biofilters are covered and isolated from extreme weather conditions (e.g. intensive rainfall or intensive heat) thereby providing optimum control of biofilter efficacy;
- Treated air from the biofilters is emitted through vent stacks to facilitate appropriate residual odour dispersion; and
- 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 will be released. Temperature sensors are used to measure the temperature in the composting tunnels. The SCADA control system ensures that the composting temperature does not exceed 65°C by adding more fresh process air to the composting mass. This reduces the odour load in the process air being transported to the odour abatement systems.

3.2.6.5 Fire Control

A number of fire control measures are implemented at the facility. These include the following:

- Control of incoming waste vehicles to ensure that no burning or smouldering loads enter the facility;
- All site operatives and employees are trained in fire prevention, control and emergency response procedures;
- Emergency response contact numbers (Fire Service, Gardaí, Ambulance and other agencies) are posted in prominent locations;
- Automatic communication of fire alarms to mobile phone numbers of assigned responsible individuals;
- Fire extinguishers, smoke detectors and fire alarms are provided in all facility buildings;
- A water bowser is available to deal with any small fires within the facility; and
- Smoking is only permitted at designated areas within the facility.

In the event of a fire at the facility, excess firewater run-off is collected within the surface water attenuation lagoons to the rear of the administration building. Any firewater generated is analysed prior to removal off-site, where required, to an approved WWTP using a tanker.

3.2.7 Restoration and Aftercare

The landfill will be restored as per the proposed levels set out in Drawing No. 10369-2009 (Restoration Plan) and appropriate landscaping will be provided. The restoration and aftercare of the facility will be carried out in accordance with the *Closure, Restoration and Aftercare Management Plan (CRAMP)* submitted to the EPA in December 2015.

The commitments to restoration and aftercare are as follows:

- On cessation of filling at each phase of the landfill the final capping layer will be installed which will include a low permeability liner and soil layer;
- This final capping will initially be seeded with grass to limit dust blow on these areas;
- The site will then be left to recolonise with natural species;
- The site will be landscaped in accordance with the plans outlined in Chapter 8 (Landscape and Visual) of this EIAR (and as presented in Section 4.5 (Landscape) of the 2008 EIS);
- Gas extraction and leachate management will continue post closure; and
- Monitoring of gas, surface and groundwater quality and other parameters as outlined in the IED Licence will continue post closure.

The current and future landscaping of the site are outlined in Chapter 8 and follow the landscape proposals as set out in the 2008 EIS which was subsequently approved by ABP.

These landscape proposals will be reviewed, if necessary, as the site develops.

3.2.8 Decommissioning

At the end of the lifespan for the MSW landfill and composting facility (currently 2028), any infrastructure associated with the waste activities will be decommissioned. Decommissioning measures that will be undertaken by Bord na Móna to ensure that there will be no environmental effects from the closed facility, are outlined as follows:

- Bord na Móna will ensure that any remaining waste materials within the facility are managed and removed off site to an appropriately licensed facility;
- All oils and fuels on site at the time of closure will be collected by an approved waste contractor;
- All mobile plant and equipment associated with the facility will be removed from the site;
- All site floor and process building walls will be power cleaned to clear all debris and dust;
- All tanks will be de-sludged and interceptors cleaned. The waste from the cleaning operations will be disposed to appropriate licensed facilities;
- Where possible, all portable or removable structures will be dismantled or removed from site;
- The weighbridge, weighbridge kiosk and wheel wash will be decommissioned and removed; and
- 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.

As per the requirements of the Landfill Directive, when the operations have ceased on site, monitoring and analysing of landfill gas and leachate from the site and the groundwater regime in the vicinity of the site, shall continue in accordance with the programme set out in the CRAMP.

It is noted that a planning application is currently under review with ABP (Case No. 300506) for future development works at the Drehid WMF which proposes to remove the restriction on the operating life of the composting facility. Where planning is granted for this proposal, decommissioning of the composting facility will not be anticipated to occur in 2028.

3.2.9 Health and Safety

Effects regarding health and safety at the facility, relate primarily to concerns about individuals either straying or trespassing into the facility, alongside the health and safety of each worker or visitor to the facility.

In the case of workers and visitors to the site, the day-to-day operation of the facility, including any activities associated with site machinery and on-site vehicles, and how visitors are to present and conduct themselves when engaging with this facility, is undertaken in compliance with all health and safety laws and regulations pertaining to such.

Security fencing is erected as detailed in Section 3.2.3.3 to prevent accidental or intentional trespass onto the facility. Warning signs are placed along the fencing at regular intervals, informing people of the potential hazards associated with unauthorised trespass.

Access to the facility is via the existing permitted access road constructed to the southwest of the facility which joins the R403 regional road at Killinagh Upper. The existing entrance at the R403 regional road is secured against unauthorised access and trespass.

All buildings are locked during non-working hours. Machinery is locked during non-working hours and parked within the confines of the site.

3.2.10 Environmental Monitoring

The following sections describe the monitoring programmes that are established at the facility. All environmental monitoring is carried out in accordance with the conditions of the existing IED Licence for the facility.

Emission Limit Values (ELV) are set by the EPA for many of the parameters to be monitored and are detailed in Schedule B of the IED Licence. Any exceedance the ELVs constitutes a non-compliance with the IED licence. Requirements for control and monitoring of emissions are detailed in Schedule C of the IED Licence. Monitoring results, including the full laboratory reports, are submitted to the EPA at quarterly intervals via EDEN.

The primary aims of these monitoring programmes are to comply with legislation, comply with the requirements of the EPA, to monitor the quality of the environment in the vicinity of the site and to identify any adverse effects as a result of operations at the facility.

As part of the IED Licence, Bord na Móna is required to submit an AER which collates and presents all environmental monitoring data each year. Within the AER, a comparative assessment is made with data from previous years.

The most recent AER for the facility (2017) was submitted to the EPA via EDEN in March 2018. Section 7.1 of the AER presents a record of any incidents on the site during the relevant year and identifies that there were 2 No. incidents on-site during the 2017 reporting period, which are summarised as:

- Elevated dust reading (1,179mg/m²/day) recorded at D1 – September 2017; and
- Exceedance of Electrical Conductivity Trigger Action limit of 698 µS/cm as set at the inlet to the onsite surface water lagoons (determined as being from salting of the roads) – December 2017.

3.2.10.1 Dust Monitoring

Dust deposition is monitored using Bergerhoff gauges, as specified in the German Engineering Institute VDI 2119 document *Measurement of Dustfall Using the Bergerhoff Instrument (Standard Method)*. Dust monitoring is carried out at gauges installed around the perimeter of the facility at the locations as shown in Figure 3.4 with grid references tabulated in Table 3.9.

Table 3.9: Dust Monitoring Locations

Monitoring Location	Grid Reference
D1	E274916, N232624
D2	E275645, N231405
D5	E273573, N230885
D6	E273916, N232659
D8	E272958, N228175

The limit of activity derived dust deposition measured at the above monitoring points will be 350 mg/m²/day, based on a 28 – 32 day composite samples averaged over a year.

Dust monitoring is carried out monthly at the above locations. During 2017, one elevated reading was recorded at D1 (1,179 mg/m²/day) in September 2017. It was noted on the field sheets that faecal waste was present in the dust gauge which had dissolved into the solution on return to the laboratory.

During construction works, the site and adjoining roads are inspected on a daily basis for evidence of excessive generation of airborne dust. This inspection is carried out by Bord na Móna personnel and by the site contractor during the construction phase. Any necessary remedial actions, such as road cleansing are implemented.

Bord na Móna have prepared a Dust and Litter Control Plan which is included in Appendix 3.1.

3.2.10.2 Groundwater Monitoring

Groundwater quality is monitored at locations both upgradient and downgradient of the facility within the overall Bord na Móna landholding. All groundwater sampling is carried out by trained personnel from Bord na Móna or a consultant and analysis is carried out off-site at an accredited laboratory.

Groundwater quality is monitored at monthly intervals at existing groundwater monitoring wells. Further detail is provided in Chapter 7 (Water). Additional groundwater monitoring wells (GW-11S, GW-11D, GW-12S, GW-12D, GW-13S and GW-13D) were installed during March 2014 as requested by the EPA to provide additional down gradient monitoring locations. Groundwater sampling is carried out in accordance with internationally accepted techniques and control procedures and the analyses are completed by a laboratory using standard and internationally accepted procedures. Samples obtained are analysed for the monthly and annual parameters specified in Schedule C.3 of the IED Licence.

As reported in the AER, the 2017 results were generally consistent with those obtained during previous years, with naturally elevated levels of ammonia detected at all monitoring wells. The monitoring programme confirmed that the site activities are not impacting on groundwater quality.

3.2.10.3 Meteorological Monitoring

There is an existing meteorological station installed on-site at the facility. Precipitation volume, wind force and direction, evapotranspiration, temperature, and barometric pressure are monitored on-site at this station.

All data is collated, tabulated and reported in the facility AER.

3.2.10.4 Noise Monitoring

Noise monitoring is carried out at five locations on an annual basis. The surveys are undertaken in accordance with the methodology specified in the *Guidance note for Noise Licence Applications, Surveys and Assessments in Relation to Scheduled Activities* (NG4) published by the EPA in 2016. The noise limits applied to the facility are detailed in Schedule B.3 of the IED Licence.

The current noise monitoring locations are shown in Figure 3.4 and the grid references are tabulated in Table 3.10.

Table 3.10: Noise Monitoring Locations

Monitoring Location	Grid Reference
N1	E273059 N231480
N2	E274690 N233140
N3	E274909 N232667
N4	E272939 N228160
N5	E275563 N230357

Noise monitoring is undertaken by suitably qualified persons employed by Bord na Móna or by consultants retained by Bord na Móna who comply with term 'competent person' as defined within NG4 (2016).

Noise monitoring undertaken in 2017 included both daytime and night time monitoring. The noise sensitive location (N1) recorded daytime LAeq levels of 38-42 dB(A) and night-time LAeq levels of 33-35 dB(A), all of which are within their respective licence limits.

Due to the significant distance separation from the facility to the nearest sensitive receptor, vibration monitoring is not required.

3.2.10.5 Air Monitoring

There are emissions to air from the existing facility generated from the odour extraction system in the compost facility, the landfill gas management plant and landfill gas monitoring boreholes. Monitoring of the emissions to air is carried out in accordance with Schedule C.1.1, C.1.2, C.1.3 and C.1.4 of the IED Licence.

The landfill gas monitoring programme includes monthly measurements of methane, carbon dioxide, oxygen and atmospheric pressure in wells located both outside and inside the waste body. The wells are at 50 m intervals around the landfill footprint and approximately two per hectare within the cells.

The concentration limit for methane (1% v/v) and the concentration limit for carbon dioxide (1.5% v/v) were not exceeded outside the waste body during 2017. Inside the waste body, methane levels varied from 18.1 to 67.7 %v/v, carbon dioxide levels varied from 13.0 to 57.3 %v/v, while oxygen levels varied from 0 to 9.7 %v/v during 2017. These levels are typical of those in an operational non-hazardous waste landfill.

A daily record of the odours observed by on-site personnel is maintained. Any odours observed and reported by members of the public off-site are also recorded. The occurrence of odour is also compared with climatic conditions. Control measures, including the compost building ventilation systems, odour abatement systems and adherence to the LOMP will minimise potentially nuisance causing odour emissions.

3.2.10.6 Emissions to Water Monitoring

Rainfall from the landfill cap and hardstand areas of the landfill discharges firstly into regulated settlement lagoons to remove the suspended solids and then into the Integrated Constructed Wetland (ICW) to remove the naturally elevated ammonia. From here, the surface water is diverted via site drains to a large settlement pond before discharging into the Cushing River.

All surface water sampling is carried out by trained personnel from Bord na Móna or by consultants retained by Bord na Móna. All analyses, except for on-site readings measured using hand-held metres, is carried out by an accredited laboratory.

Bord na Móna carries out weekly inspections of the surface water drainage system. The inspections completed in the 2017 reporting period did not identify the presence of any impact on the drainage system associated with site activities.

Surface water monitoring is conducted weekly at three locations (SW4, SW5 and SW6) as specified in the IED Licence. The locations of the monitoring points are shown in Figure 3.4 and the grid references are tabulated in Table 3.11.

Table 3.11: Surface Water Monitoring Locations

Monitoring Location	Grid Reference
SW4	E271601 N231227
SW5	E274059 N230848
SW6	E274401 N231525

Biological Oxygen Demand (BOD), Ammonia and Total Suspended Solids (TSS) levels recorded in 2017 were compared to their relevant ELV's as set out in the IED Licence. SW6 is located at the outlet of the ICW and there were no ELV exceedances at this discharge location during 2017. There were no ELV exceedances recorded at SW5, which is located downstream of the settlement lagoons before the discharge into the Cushaling River, during 2017. There were also no ELV exceedances recorded at SW4, which is located at Dillon's Bridge on the Cushaling River, during 2017.

3.2.10.7 Ecological Monitoring

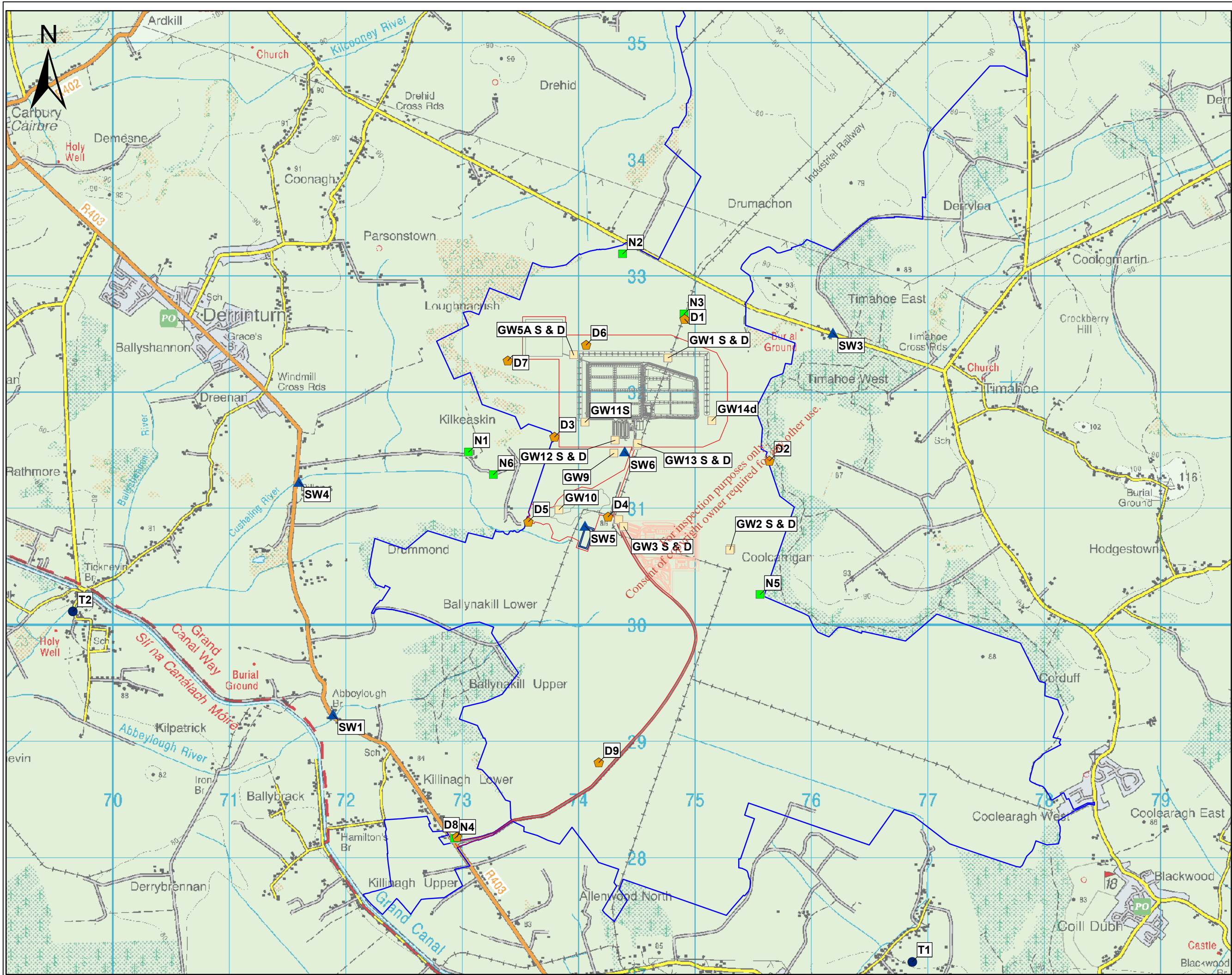
The site is maintained and monitored on a regular basis in accordance with the landscape planting scheme, as part of the final restoration plan, to confirm that the planted trees, shrubs, grasses etc. have sufficiently established at the site.

Biological sampling is undertaken at one monitoring location downstream of the facility (SW6). As the river rises on-site, there is no upstream sampling location. The assessment uses the EPA Q-rating system for the evaluation of rivers and streams. Benthic macro-invertebrates are sampled qualitatively using kick sampling and the results determine the Q-Value.

The annual biological assessment of the Cushaling River is carried out in accordance with Schedule C.3 of the License and was most recently completed on the 22nd August 2017. The kick sampling results indicate that the Q-Value is Q3, which is moderately polluted.

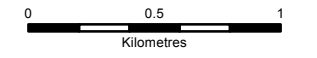
The results reflect the findings of the previous assessment undertaken in September 2016 and that of the 2008 assessment, which was carried out prior to waste acceptance. The assessment indicates that the facility is not impacting upon the biological quality of the Cushaling River.

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Legend

- Site Boundary
- Bord na Móna Ownership Boundary
- Existing MSW Landfill
- Consented MBT Facility
- Existing Settlement Lagoon
- ▲ Surface Water Monitoring
- Groundwater Monitoring Locations
- ◆ Dust Monitoring Locations
- Noise Monitoring Locations
- Biological Sampling Location



- ### 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

Rev A	Date	Description	By	Chkd.
July '18		EIAR Issue	F.H.	R.H.

Client:

Naturally Driven

Project:

EXISTING DREHID WASTE MANAGEMENT FACILITY

Title:

ENVIRONMENTAL MONITORING LOCATIONS

Scale @ A3: 1:30,000

Prepared by:	Checked:	Date:
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Figure 3.4 Rev: A

3.2.11 Contingency Arrangements

3.2.11.1 Contingency Plans for an Emergency On-Site

Any accidents and other emergencies at the facility 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 are prominently posted onsite. All site operatives and other relevant employees of Bord na Móna are regularly trained in emergency response procedures and in fire prevention and control.

Site safety procedures are 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 are available in the administration building. Emergency and first-aid procedures are prominently displayed in the site buildings and adjacent to the surface water settlement lagoons.

1. An Emergency Plan has been prepared and is maintained at the facility. This Plan details any emergency situation which could occur on site and the response procedure should this emergency occur. The Emergency Plan details procedures for the following occurrences:
 - ERP 02 Spill Clean-up Procedure
 - ERP 03 Fire / Explosion Procedure
 - ERP 04 Malicious Damage Procedure
 - ERP 05 Unforeseen Emergencies
2. Should an emergency situation occur the relevant response procedure documented within the Emergency Plan will be implemented. Each procedure details the emergency situation, the response procedure should this emergency occur and the potential environmental impacts of this occurrence.
3. The Facility Manager fulfils the role of Site Incident Controller, with responsibility for:
 - i. assessing the scale of the incident;
 - ii. informing emergency services; and
 - iii. directing rescue and fire-fighting operations.

In the absence of the Facility Manager, the designated Environmental Officer shall assume the role of Site Incident Controller.

4. In an emergency situation, the Facility Manager will be contacted immediately via the two-way radio system. The weighbridge radio acts as the main point of contact for the Facility Manager.
5. Following an emergency, the Facility Manager (or in his absence the designated Environmental Officer) will 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 will be implemented accordingly i.e. Environmental Non-Conformance Procedures (EP 9.0), Environmental Incident/Release

- Investigation and Reporting Procedures (EP 8.0) and Environmental Corrective and Preventative Action Procedure (EP 10.0).
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.
 7. The Facility Manager is designated to notify the EPA as soon as possible after the occurrence of an incident as per procedure EP 17.0 Reporting.
 8. In the case of any incident which relates to discharges to water, the Facility Manager is tasked with notifying the Local Authorities and Inland Fisheries Ireland (IFI) as soon as practicable after the incident.
 9. On a weekly basis, all emergency response equipment is checked to ensure it is provided in agreed quantities and in suitable working order. The dust suppression water bowser is checked on a daily basis to ensure that it is full of water.
 10. In the case of an emergency situation that arises outside the hours of operation, the security person shall immediately contact the designated person on call.

3.2.11.2 Contingency Plans for any Breakdowns On Site

The regular maintenance of all plant and equipment utilised on-site is undertaken in accordance with the manufacturer's guidelines. This maintenance programme helps 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. As previously outlined, a maintenance building is provided on-site to facilitate this maintenance programme. All plant and equipment are checked on a daily basis.

3.2.11.3 Contingency Plans in respect of Absentee Staff

Off-roster fully trained staff are deployed to the site in the event of sickness to key personnel. This also applies to general site operatives and plant operators, who will be sourced from local plant contractors should the need arise.

3.2.11.4 Contingency Procedures outside of Normal Operating Hours

Site personnel and other employees of Bord na Móna are available in the event of any emergency at the site outside of normal working hours. An emergency contact number is prominently posted at the existing entrance at the R403 regional road.

Local emergency services have been informed of contact numbers for key Bord na Móna personnel. Outside of normal working hours, security personnel are in place at the site who also have the relevant contact numbers. These security arrangements are implemented in order to guard against unlawful trespass and vandalism. Basic routines exist whereby any cash, records and equipment are either taken

off-site daily or secured within the administration building. These procedures are in place in the interest of overall security.

3.2.11.5 Contingency Plans in the Event of Environmental Contamination

It is important to note that leachate and process wastewater will be collected, fully contained and fully isolated from the surface water collection system for the lifetime of the facility.

The discharge from the surface water settlement lagoons through the ICWs to the surface water drainage system and eventually the Cushaling River is 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 allows for the retention of all surface water on-site until the contamination event is investigated and remediated.

3.2.12 Employee Welfare

Facilities are included at the site to cater for the health, safety and welfare of employees. The provision of welfare facilities which include for the sanitary, hygiene and comfort requirements of staff are in place at the Drehid WMF. Employee welfare considerations with respect to noise and air quality are detailed below.

Noise at Work

Noise levels within waste buildings have the potential to exceed the noise action levels contained within the *Safety, Health and Welfare at Work (General Application) Regulations (2007)* (as amended) depending on the level of activity occurring and the duration of time operatives are working in certain areas. The lower action level of 80 dB (A) $L_{EX, 8h}$ may be exceeded in the composting buildings and the upper action level of 85 dB (A) $L_{EX, 8h}$ has the potential to be exceeded in certain working areas, depending on the proximity of staff to operating machinery and their exposure time to higher noise levels.

In line with the *Safety, Health and Welfare at Work (General Application) Regulations 2007* (as amended) the following applies.

For those areas where the Lower Action Limit is exceeded it is necessary for the employer to:

- reduce the risk of hearing damage to the lowest level that is both reasonable and practicable;
- carry out noise assessments and keep records of the results;
- inform, instruct and train employees about the risks to their hearing;
- make personal hearing protection available to workers;
- make preventative audiometric testing available for workers, and;
- ensure that any equipment provided to reduce exposure of employees is properly maintained.

For those areas where the Upper Action Level (85 dB (A), $L_{EX, 8h}$) is exceeded, the employer must:

- reduce exposure to noise so far as it is reasonably practicable by means other than personal hearing protectors (i.e. engineering and/or operational measures);
- designate hearing protection zones with notices; and
- issue personal hearing protectors to all employees exposed at this level and ensure that they are used.

In all instances the employees have the following obligations:

- use the hearing protectors provided;
- use any other protective measures provided;
- report any defects in the equipment provided to the employer; and
- employees have the right to hearing checks where noise assessments indicate a risk of hearing damage.

In this instance, hearing protection is provided within the composting facility and the maintenance building.

Air Quality

Section 11.2.2.1 discusses ambient air quality limit values which are set for the protection of human health. However, workplaces are also covered by a separate guidance. The Health & Safety Authority (HSA) have set Occupational Exposure Limit (OEL) values for a range of compounds in order to provide a basis for ensuring that exposure to airborne contaminants in the workplace is controlled in such a way as to prevent adverse health effects. These OELs are detailed in the *Code of Practice for the Chemical Agents Regulations* (2016). The OEL can be expressed on the basis of two averaging periods; an eight-hour average (Time-weighted average (TWA) for a conventional 8-hour day / 40 hour week) and a fifteen minute average (the short term exposure limit (STEL) based on 15 minutes, 4 times per day). HSA guidelines for safe working and PPE are followed at all times at the existing facility.

During any construction periods, the main contractor is required to implement a dust management plan to minimise dust emissions. This reduces effects both from a dust soiling and human health point of view.

During the operational phase, maintenance of all systems in place for control of emissions is essential to ensure emission concentrations are minimised. This includes monitoring in accordance with the IED Licence to ensure emission control systems are working as designed.

3.3 COMPOSTING FACILITY

The composting facility provides for the biological treatment of the following feedstocks:

- Organic Fines; and
- Source Separated Bio-waste.

Organic fines are the undersize fraction generated by the screening of residual MSW following an initial coarse shredding process. As the name suggests, organic fines primarily comprise organic material in the form of food and garden waste. The biological treatment of organic fines generates the following biostabilised waste outputs:

- Compost Like Output (CLO); and
- Oversize Material.

The screening of biostabilised waste, arising from the biological treatment of organic fines, produces an undersize fraction and an oversize fraction; CLO is the undersize fraction and as the name suggests, CLO resembles compost. However, the quality of this material, due to the presence of contaminants such as glass and heavy metals, is not currently envisaged to be at a standard that would allow it to be spread on land. Rather, this material is either recovered (as an engineering material at the MSW landfill) or disposed of at the MSW landfill. The oversize material is also disposed of at the MSW landfill.

Source separated bio-waste arises from the separate collection of food waste and garden waste at domestic and commercial premises. In Ireland, the collection of source separated bio-waste is typically facilitated by the provision of brown bins to domestic and commercial premises. Both organic fines and source separated bio-waste is regarded as an Animal By-Product pursuant to the EU Animal By-Products legislation. The existing composting facility is designed, constructed and operated in accordance with EU Animal By-Products legislation as implemented in Ireland by the Department of Agriculture. This requires the approval of the facility by the Department of Agriculture for the acceptance and treatment of Animal By-Products.

Waste Acceptance

The design and construction of the waste reception area is such that waste delivery vehicles are not required to enter the composting building. Waste delivery vehicles reverse to the waste receiving doors and discharge waste down into the waste reception bunker. The finished floor level of the waste reception bunker is approximately 2.5 m below the finished level of the external area. There are two waste receiving doors provided at the composting building. Each waste receiving door is 4.5 m wide. Concrete kerbing or wheel guides, with a minimum height of 200 mm, is provided at each side of the waste receiving doors to guide trucks to the centre of the doorway. Doors at the waste reception area are rapid closing doors, with an opening or closing time of approximately 20 seconds.

Waste received on the tipping floor is either moved to dedicated storage areas by the dedicated wheel loader operating in the reception area or is fed directly to the shredder/mixer hopper. Concrete walls in the reception area facilitate material handling while a drainage system collects run-off and directs it to the plant leachate holding tanks. Regular washdown procedures are implemented within the waste reception area. The waste reception bunker is designed to accommodate the storage of approximately three days

of incoming waste, thereby providing contingency in the event of the mechanical processing equipment being unavailable for a time.



Figure 3.5: Waste Receiving Doors at the Existing Facility

Waste Pre-Treatment and Tunnel Feeding

Pre-treatment is in the form of a low speed shredder mixer, located within the waste reception area, which provides the following actions:

- Bag opening (in the case of source separated bio-waste) to allow for all contents to be available to the composting process;
- Shredding of green waste trimmings and other large size bio-waste to provide suitable structure to the input mix; and
- Good mixing of the input waste streams.

The output material from the shredder is conveyed to an intermediate storage concrete bunker. The wheel loader travels from the lower level waste reception area to empty this storage bunker and load the composting tunnels as per the operating schedule of the process. It is important that the input material is loaded in an even manner within the tunnels.



Figure 3.6: Typical Shredder

Tunnel Composting

The tunnel composting process is divided into the following phases:

- Phase I composting;
- Phase II composting;
- Maturation (only relevant to the processing of source separated bio-waste feedstock);
- Refining; and
- Pasteurisation (only relevant to the processing of source separated bio-waste feedstock).

Phases I & II and the maturation phase occur within the concrete composting tunnels in the main processing area of the plant. Material will initially be loaded into a tunnel for an approximate two week period (Phase I) after which it is moved to another tunnel for a further two week period (Phase II). Phases I & II apply to both the treatment of organic fines feedstock and source separated bio-waste feedstock.

Following Phase II, in the case of source separated bio-waste feedstock, the composted material is moved for a third time to another tunnel for an approximate maturation period of one week. The maturation stage is not relevant to the treatment of organic fines.



Figure 3.7: Loading of Dry AD Tunnels

Each composting tunnel consists of a sealed concrete structure provided with a unique door equipped with a rubber sealing. The concrete floor of the tunnel houses a series of parallel PVC pipes which are incorporated within the floor along the length of the tunnel. These pipes are provided with tapered plastic nozzles (spigots).



Figure 3.8: Typical Composting Tunnel with Spigot Floor

Each tunnel has a dedicated centrifugal fan which blows a mixture of fresh air and process air through the air plenum via the spigot pipes to the composting material. Pressurised air flows through the material mixture from the spigots ensuring intensive contact between the air and the input material. This provides complete control of the composting process ensuring that aerobic conditions can be maintained in the material.

Both re-circulated process air and fresh air will be fed into the material using the computer controlled, electrically actuated, valves. The quantity of air supplied is determined by the phase of the composting process. The control of the tunnel fan is mainly based on the compost temperature. A frequency transformer controls the fan's capacity. The setting for the fresh air supply valve is based on the measured

oxygen value and the compost temperature. At high temperatures, the fresh air supply connected to the relevant central air ductwork is further opened and a large quantity of fresh air flows into the tunnel. When the oxygen level is too low, the supply of fresh air to the tunnel is also increased. The re-circulation air supply valve is electronically linked to the fresh air supply valve and its operation is exactly opposite to the fresh air supplying valve. If less re-circulation air is supplied, more fresh air is automatically blown through the material. Each composting tunnel has its own aeration system and is connected to two central air ductworks: the central fresh air supply ductwork and the central process air discharge ductwork for the warm and humid air released during the composting process.



Figure 3.9: Typical Aeration Fan and Ductwork Installation

Exhaust air as well as the unused fresh air collected from the other areas of the composting facility, flow through a humidifier and a biofilter before leaving the system. The biofilter units are located above the composting tunnels in the composting building. The discharge air connection to the tunnels is equipped with a one-way air valve, which ensures that no air enters another tunnel, through failures or overpressures in the central suction system.

Tunnels are equipped with a sprinkling system which is used to balance the material moisture. Each tunnel is also equipped with a negative pressure protection valve while overpressures are managed by a central safety valve located in the main exhaust duct.

In the composting tunnels, negative pressure is maintained throughout the process in order to prevent polluted and odorous air being released inside the buildings. The whole composting plant operates under

negative pressure in order to minimise the escape of any potential fugitive odours from the building when the facility doors are open e.g. during waste delivery.

Compost Refining

Following the tunnel composting process (in the case of source separated bio-waste feedstock), the material is fed by the 'dirty area' wheel loader to the buffering and dosing hopper feeding the refining line. The hopper feeds the material to a belt conveyor which transfers it to a screener. The conveying line is also equipped with a magnetic separator for the removal of ferrous metals. The screen produces two fractions:

Source Separated Bio-waste feedstock

- < 12 mm
- > 12mm

In the case of source separated bio-waste feedstock, the undersize fraction is conveyed to a densimetric separator which separates hard particles such as stones and glass from the compost stream. These fractions are collected within bunkers for discharge and disposal. The treated compost material is collected in another bunker for transfer to the pasteurisation tunnel.

The oversized fraction is collected and re-used as structural material in the composting process. This material is passed through a wind sifter to remove light plastics which are blown out through an enclosed tube to a covered collection skip external to the composting building.

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Wind Sifting Process

The wind sifting process typically involves the use of air to separate the light fraction from screening residues. A pressure-suction process enables an effective separation to take place. In the first step, material is subjected to a pressurised air stream. The high-pressure air causes the lightweight materials to rise within a chamber and subsequently fall on top of the heavier materials. In the second step, the lightweight material is drawn off by a powerful suction blower.



Figure 3.10: Wind Sifter Principle

Compost Pasteurisation

In the case of source separated bio-waste feedstock, the undersize 12 mm compost fraction is subjected to a pasteurisation stage to facilitate its application on land in accordance with Animal By-Products legislation. The pasteurisation stage is not relevant to the treatment of organic fines.

The pasteurisation tunnel consists of a single insulated tunnel through which all material must pass in order to move to the 'clean' area of the facility. To this end, the tunnel has doors at both ends. Compost that has been refined is loaded into the pasteurisation tunnel from the 'dirty' processing area. The tunnel is aerated in a controlled manner through the floor resulting in the re-activation of the remaining microbial population within the material and the resultant generation of heat. In order to ensure that the required processing standard temperature is achieved, a heating back up system is provided by a dedicated water boiler and water-air heat exchanger.

Once the required time-temperature parameters (70°C for a period of one hour) have been achieved and recorded within the pasteurisation tunnel, the material is ready to be unloaded from the 'clean' area of the plant.

Compost that has been unloaded from the pasteurisation tunnel will be stored in one of two quarantine areas while microbial testing is carried out. The material contained within one full loading of the pasteurisation tunnel is deemed to be a batch. A batch is moved to a quarantine bay within the compost storage area using the dedicated clean area wheel loader and sampling is carried out immediately. Once compliant sampling results are received from the laboratory, the batch is moved to the wider compost storage area for storage until such time at the material is removed from the plant.

3.4 MSW LANDFILL INFRASTRUCTURE

The existing MSW landfill is currently licensed to accept up to 120,000 TPA of waste material for disposal up to the year 2028. As previously outlined, from April 2009 to December 2017, the facility was granted planning permission and a revised Waste Licence to intensify waste acceptance up to 360,000 TPA to satisfy the national demand for waste disposal infrastructure during this period.

The 2017 AER outlined the waste types disposed of and recovered at the landfill in 2017 and these are presented in Table 3.12.

Table 3.12: Landfill Inputs and Outputs

Waste Inputs	Description	Tonnes
Municipal	Mixed commercial and domestic	213,444.90
	Street cleansing and Local Authority clean-ups	52,957.19
	Biostabilised waste	49,357.97
Industrial	Non-hazardous industrial solid waste	614.16
Sludges and filter cake	Non-hazardous municipal and industrial	2,971.08
C&D	Mixed construction and demolition waste	379.62
	Non-hazardous soils and stones (incl. Japanese Knotweed)	18.00
	Fines for disposal	2,336.27
	Non-hazardous dredging spoil	5,807.01
Total Disposed to Landfill Facility		327,886.20
Industrial	Ash	5,490.23
Sludges and filter cake	Waste from desanding	414.84
C&D	Soil and stones	23,022.81
	Shredded timber	2,591.80

Waste Inputs	Description	Tonnes
	Bituminous mixtures	13.52
Total Non-Inert Recovered at Landfill Facility		31,533.20
C&D	C&D rubble	52,801.54
	Soil and stones	56,620.57
	C&D fines	111,383.18
	Dredging spoil	604.54
Municipal	Glass	5,881.68
Total Non-Inert Recovered at Landfill Facility		227,291.51
Waste Outputs	Description	m ³
Leachate & Foul Water	Generated from landfill and foul water	40,189.00

3.4.1 Phasing of the Landfill

The landfill is constructed in 15 No. Phases as shown on Drawing No. 10369-2002 and covers an area of c. 39 ha. The current status of landfilling and phase construction is detailed in Table 3.1. Stripping of the peat layer and preparation of the ground to the formation levels required takes place prior to the development of each phase.

After deposition of waste, the final capping is installed, and full restoration takes place. Following reprofiling, the final capping system, as detailed in Drawing No. 10369-2007, consisting of a gas collection layer, a low permeability barrier layer, a linear low-density polyethylene liner and woven geotextile, a drainage layer, subsoil and topsoil, is placed. The maximum height of the fully completed capped landfills is approximately 103.25m AOD. The proposed final contours for the facility are shown on Drawing No. 10369-2003. Contouring is carried out to allow surface water run-off from the top of the landfill, thereby preventing ponding and minimising the risk of infiltration into the waste body. Following final capping each phase will be allowed to recolonise with natural species.

The basal liner for subsequent phases is constructed in conjunction with the deposition of waste into previous phases. The future construction and filling of phases in the landfill is presented in Table 3.2.

The landfill will also be continually landscaped utilising a combination of slope embankments and tree planting in order to minimise any visual effects. Upon placement of final capping each phase will be seeded with grass, which will help to minimise any visual effect at the site. This has been completed for Phases 1 – 4 already.

3.5 BASAL LINING SYSTEM

As outlined in Section 3.4, the landfill will be constructed in 15 No. Phases with each phase encompassing a basal liner consisting of a HDPE liner overlaying a layer of Bentonite Enhanced Soil (BES). Lined cells

will continue to be constructed in accordance with the EU Landfill Directive and the EPA *Landfill Design Manual* (2000), allowing for the isolation of the deposited waste at the site.

Landfill cells are constructed on areas cleared of vegetation and peat, either cut or filled, depending on topography, to the formation levels shown on Drawing No. 10369-2002. The basal lining system is capable of containing the leachate generated from the waste body above the liner. The construction of the final capping layer will reduce the infiltration to the waste body and therefore the volume of leachate generated.

The basal lining system constructed at the site consists of a number of different layers as detailed in Drawing No. 10369-2006. The basal lining system, from top to bottom, is described as:

- Leachate drainage layer (thickness 500 mm) with a hydraulic conductivity of greater than 1×10^{-3} m/s. A high density polyethylene (HDPE) drainage pipe network is imbedded in the drainage layer to collect the leachate and drain it to a leachate collection sump. The pipe work is surrounded by gravel material (e.g. Clause 505B or equivalent). The slotted leachate pipes have a minimum diameter of 250 mm, with slots of 5 – 6 mm and the header lines have a minimum diameter of 355 mm;
- Protection layer consisting of a woven geotextile (> 750 g/m²) or similar with a high California Bearing Ratio (CBR) puncture resistance lain underneath the drainage layer;
- Barrier layer consisting of HDPE geomembrane liner (2.0 mm). A 2.0 mm HDPE liner is chosen because it has to withstand potential corrosion due to leachate and the ability to accommodate settlement in the underlying ground. The membrane has an elongation at break of over 500%;
- Low permeability BES with a hydraulic conductivity of less than or equal to 5×10^{-10} m/s constructed in two lifts of 275 mm to give a minimum compacted layer of 500 mm. The BES is laid under the HDPE liner and in addition to providing a barrier to leachate migration, it also provides the foundation for the HDPE liner;
- Undercell drainage consisting of a herringbone arrangement of drainage pipe work or a 300 mm layer of drainage stone; and
- Natural mineral subsoils underlie the undercell drainage system. Field tests indicate that the natural mineral subsoil has an average vertical permeability of 8.2×10^{-10} m/s.

3.5.1 Method Statement for Installation of Basal Liner

A detailed method statement for the placement of the basal liner is required to be prepared by the appointed Contractor prior to commencement of the works. A comprehensive and proven methodology has been adopted and is detailed in the CQA Report for each completed Phase of the landfill. A summary of the typical methodology is as follows:

1. Clear scrub and other vegetation from the required area as appropriate.

2. Prepare the base for the construction to the desired formation levels through excavation of peat and mineral subsoil to required elevation.
3. Place the undercell drainage system to drain any underlying water.
4. Place a separation geotextile top of the undercell drainage system prior to the installation of the BES liner.
5. Place the layer of low permeability BES (at least 500 mm, in lifts of 275 mm) allowing for compaction.
6. Ensure that the layer of BES is free from any contaminants prior to laying the HDPE liner.
7. Unroll the HDPE membrane panels according to the layout plan for the panels.
8. Weld the panels using a fusion welder with an open channel for air pressure testing.
9. Visually check the liner and test the seams.
10. Unroll the geotextile protection layer according to the layout plan for the panels ensuring an overlap of at least 500 mm of the material.
11. Cover the geotextile protection layer with the drainage layer. The drainage layer consists of 16-32 mm non-calcareous (<10% CaCO₃) stone. Hydraulic conductivity is greater than 1×10^{-3} m/s. Extreme care must be taken so as not to damage the geomembrane liner.
12. Excavate the trench in the drainage stone layer for the leachate collection drains.
13. Place and connect the HDPE leachate collection drains.
14. Backfill the trench with drainage stone and complete the drainage layer.

3.5.2 Safety Statement

All work is subject to the *Safety, Health and Welfare at Work (Construction) Regulations* and all current legislation. A detailed safety statement is prepared at contract document stage and finalised on commencement of construction of the basal liner.

3.5.3 Quality Control

The lining manufacturer and supplier have specific quality control and assurance policies in operation that cover all aspects of the manufacture, supply and installation of their liner systems. At manufacture stage, there is a systematic dimensional, chemical and physical testing regime in place that checks a variety of liner parameters including durability and thickness undertaken to BS, ISO, ASTM and DIN Standards.

With the installation of the liner system, the manufacturer is required to provide the following services to the Contractor:

- a) Technical consultation prior to commencement of the work to familiarise the main contractor with the capabilities of the product, to assist them in determining panel size, installation methodology and design of any special equipment such as spools, carrying frames etc. which may be required.
- b) Supply to site of pre-cut panels for the liner to sizes determined by the main contractor complete with interlocks welded on and sealing tubes.

- c) Provision of one or more welding technicians on site to cut and weld panels to dimensions determined by the main contractor on a day to day basis. These personnel also carry out any modifications or repairs that may be required during installation.
- d) If requested, the liner manufacturer provides an engineer on site during installation to give advice relating directly to their products.

3.5.4 Quality Assurance

CQA is carried out in accordance with the procedures set out above. A comprehensive Quality Assurance Plan is provided by the liner manufacturer to maintain the integrity of all aspects of their quality control, testing and installation regime. An experienced and fully qualified employee of the lining manufacturer is responsible for quality assurance. Installation of the entire containment system, including the installation of the HDPE liner is carried out under the supervision of an experienced, fully qualified Engineer and Bord na Móna Resident Engineers.

Pre-commissioning tests consist of air testing of the seams between liner sheets. Air is pumped into the seam through a small hole drilled for this purpose. The liner seam is deemed to pass when air at a specified pressure remains at this pressure within tolerances over the test period. Test holes in seams are repaired before full integral testing of the liner. Following testing of all seams, the electrical conductivity between the upper and lower faces of the liner is tested.

Pre-commissioning tests of the liner are supplemented by field testing of welds. This involves the testing to destruction of test welds made by the welding specialists under field conditions, and by the Quality Assurance System of the liner welding contractors.

A leak detection survey for the lined cells is also carried out. This survey is part of the CQA programme. A mobile survey is performed after the total cell is filled with the drainage layer.

3.5.5 Material Balance

As detailed in Section 3.2.1, the majority of the landfill has been already constructed to date. Construction of Phase 13 of the landfill was completed in June 2018 and is awaiting EPA approval to commence placing waste. Site clearance and preparation works are currently being undertaken for Phase 14 in accordance with SEW Report No. 13 and will also be carried out for Phase 15 in accordance with this SEW Report.

Table 3.13 below outlines the estimated type and quantities of materials required to construct the remaining elements of the MSW Landfill. The construction material requirements are for Phases 14 and 15 only unless otherwise stated.

Table 3.13: Estimated material balance for the construction of the MSW Landfill

Item	Material	Quantity	Source
Material for bund construction (Phase 15 only)	Compacted suitable subsoil materials	13,364 m ³	Won on-site

Low Permeability Basal Layer	Bentonite Enhanced Soil - BES; Bentonite (Bentonite is 5% of volume of BES)	1,056 m ³	Import
	Bentonite Enhanced Soil - BES; Sand	20,064 m ³	Import
Basal Geomembrane Liner	Flexible HDPE geomembrane liner (2.0mm).	42,240 m ²	Import
Protection Layer	Layer of woven Geotextile (750g/m ²) or similar	42,240 m ²	Import
Basal Drainage Layer	Granular Material e.g. Clause 505B (500mm)	16,122 m ³	Import
Daily Cover (Phase 13, 14 & 15)	Hessian rolls or similar	50,760 m ²	Import
Temporary Cover (Phase 13, 14 & 15)	Low permeability clay (300mm)	21,801 m ³	Won on-site
Gas Drainage Layer (Phases 5-15)	Geosynthetic Gas Drainage Layer e.g. EnkaDrain or similar	266,468 m ²	Import
Capping Geomembrane Liner (Phases 5-15)	Flexible LLDPE geomembrane liner (2.0mm) or Geosynthetic Clay Liner (GCL) or similar.	269,280 m ²	Import
Capping - Low Permeability Layer (Phases 5-15)	Clay 300mm thick Layer	53,295 m ²	Import
Protection Layer	Layer of woven Geotextile (750g/m ²) or similar	48,960 m ²	Import
Capping Drainage Layer (Phases 5-15)	Granular Material e.g. Clause 505 (300mm) or similar including reprocessed C&D material	79,939 m ³	Import
Capping Subsoil (Phases 5-15)	Subsoil (850 mm)	226,499 m ³	Won on-site
Capping Topsoil (Phases 5-15)	Topsoil (150 mm)	39,970 m ³	Won on-site

Two material borrow areas have been permitted at the site, as a source of construction and restoration material for the facility.

A permitted clay borrow area to the northwest of the Phase 8 footprint is used, as required, as a source of material for embankment construction, temporary cover and low permeability clay fraction required for final capping. Where possible, material generated during stripping and clearing of ground is used for embankment construction.

Sand is required for the BES layer and granular materials are required for sub-base for the road construction. These materials are imported for the construction of the roads, parking areas and the landfill

liners. The raw bentonite material for the BES, all geomembrane compounds, the geosynthetic drainage material, the geotextile compounds and the hessian material are sourced on the basis of competitive tendering. These materials are imported to site on a phased basis in accordance with the construction requirements.

3.6 LEACHATE MANAGEMENT

Leachate generated in a landfill is a liquid, produced from rainwater that has percolated through the waste, picking up suspended and soluble materials that originate from, or are products of, the degradation of the waste. The control of leachate is paramount in the design and operation of any landfill. Measures are necessary to minimise leachate generation and to collect and remove it in an environmentally safe manner. The leachate level in the landfill is controlled primarily by the leachate collection pipe work and removal system, which allows leachate to be pumped through a rising main to the leachate holding tanks.

Leachate formed in the landfill is a potential source of contamination of both the surface watercourses and the groundwater resources surrounding the landfill site. From the viewpoint of necessary treatment of leachate, the volume of leachate generated must be minimised and the separation of 'clean' water and leachate is the basic philosophy in designing the water management system at a landfill site. The quantities of leachate and foul water generated at the facility in the past five years are presented in Table 3.14.

Table 3.14: Leachate and Foul Water Quantities Managed at the Existing Facility

Year	Leachate Managed (tonnes)
2017	40,189
2016	47,883
2015	40,039
2014	42,798
2013	51,978

A herringbone leachate collection system is constructed on top of the basal liner. The leachate drains to leachate collection sumps, from where the leachate is pumped to two glass lined leachate holding tanks located adjacent to the landfill gas compound to the south-west of Phase 9 of the landfill. As detailed in SEW Report No. 14, following the installation of a trial reverse osmosis (RO) plant in 2015, a proportion of the raw leachate is now processed to produce permeate and concentrate using the RO plant on a permanent basis. Bord na Móna received approval from the EPA in December 2017 for the permanent use of the RO plant.

A process flow diagram for the leachate management system is presented in Figure 3.11.

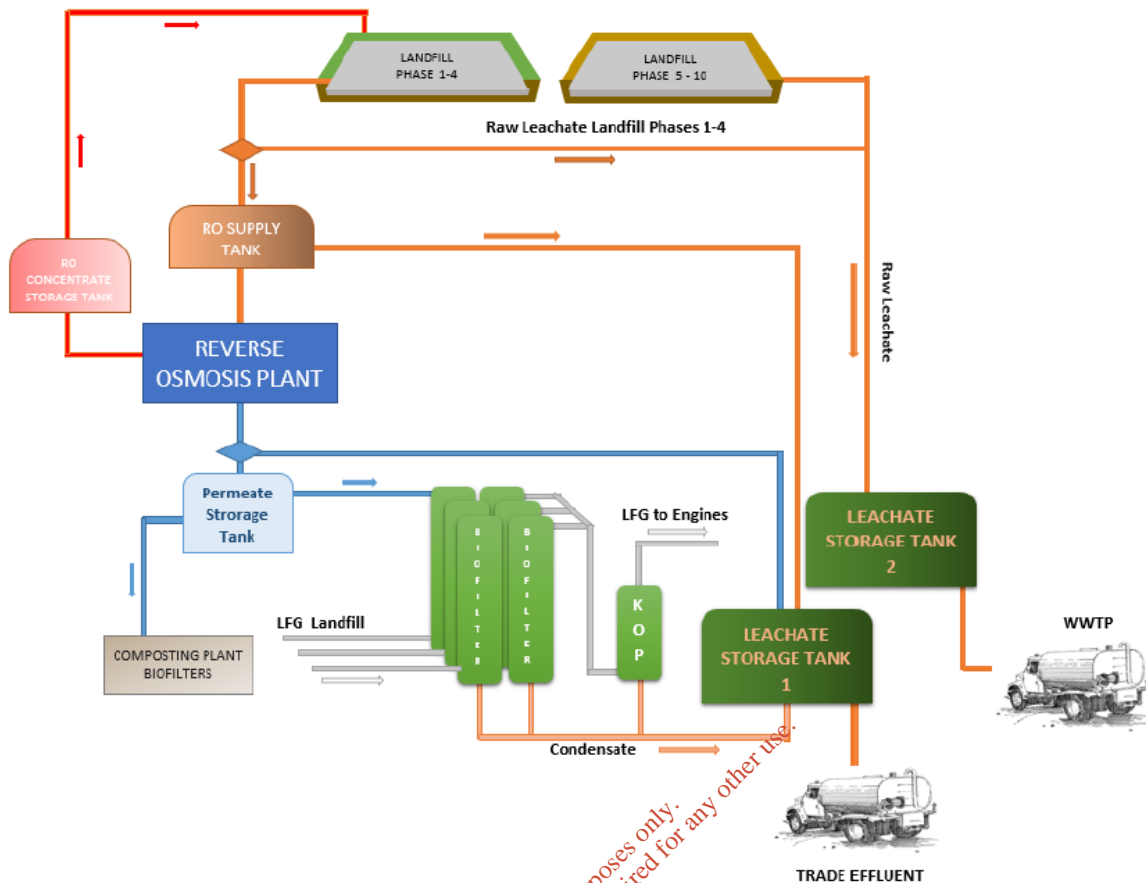


Figure 3.11: Leachate Recirculation Process Flow (Source: from SEW Report No. 14)

It is proposed that the permeate generated from the RO process will be managed in one of the following ways:

- Utilisation as process water within an existing Landfill Gas Cleaning System at the Landfill Gas to Energy Plant;
- Utilisation as process water within an existing odour abatement system – biological filters in the composting plant; and
- Transported off site to trade plants and/or Irish Water WWTP's.

The concentrate liquid can be managed by recirculating same back into the sections of the landfill that have had the final cap applied. The works required to install the leachate recirculation system are detailed in SEW Report No. 11 and updated in SEW Report No. 15. The recirculation pipework will discharge leachate to header tanks located in a bund on top of the landfill which is planned to be completed and operational by end of 2018. It is currently proposed that the leachate recirculation will be carried out at the facility in the short to medium term and depending on prevailing circumstances such as capacity at WWTPs, Bord na Móna may decide to send some or all of the concentrate off-site to a licensed facility. Bord na Móna is not intent on recirculating all concentrate produced back into the landfill.

3.6.1 *Composition of Leachate*

Leachate quality depends on several parameters. The most important are:

- Solid waste composition (organic matter);
- Water balance and water handling on the landfill;
- Recirculation of leachate;
- Age of leachate;
- Operation of the landfill; and
- Speed of landfilling.

Leachate samples are analysed quarterly for BOD and COD at one monitoring location (TK2). The samples are also analysed annually for the range of parameters specified in the IED Licence. The results are typical of those of a leachate from a relatively young MSW landfill and the 2017 results are detailed in the AER.

3.6.2 *Leachate Collection and Removal System*

The leachate collection system design is described in Section 3.5 whereby a herringbone leachate collection system is constructed on top of the basal liner with the leachate draining to collection sumps from where the leachate is pumped via side slope risers to the leachate collection tanks.

It is possible to pump leachate independently from each of the leachate collection sumps. This allows for more flexibility with respect to the management of the leachate on-site, particularly during the active life of the facility. In addition, the leachate collection system is designed in such a manner that, following the closure of the landfill and when the leachate levels in the landfill decrease, it will be possible to pump the leachate directly from the collection sumps for tankering off-site. This will allow for the option of decommissioning the on-site leachate holding tanks and RO plant.

The head of leachate in the waste body is maintained below a level of 1 m in height, a level sensor is set at a level below 1 m and when the leachate reaches this level the leachate is pumped to the leachate holding tanks at the location shown on Drawing No. 10369-2001.

A system control and data acquisition (SCADA) system for monitoring the depth of leachate in each of the phases has been developed at the site that allows for the automatic activation of the pumps in each of the leachate collection sumps. The SCADA system also ensures that leachate is only pumped to the leachate treatment area when there is sufficient capacity in the storage tanks. If this capacity is not available, then the leachate can be recirculated to existing cells for temporary storage or it is tankered off-site for disposal.

Raw Leachate is currently tankered off-site to appropriate WWTPs /trade plants for treatment. As per the 2017 AER, leachate was directed off-site for treatment at Leixlip WWTP, Ringsend WWTP and licensed/permitted facilities operated by ENVA during 2017.

3.7 LANDFILL GAS MANAGEMENT

Landfill gas is the end product of the microbiological degradation of organic material. It is produced under anaerobic conditions, for example in the waste body of a landfill site. The degradation process takes place in different steps, in which the raw organic material is degraded to smaller material that, in the course of the processes, is converted into landfill gas. In undiluted form, landfill gas consists primarily of the methane (approximately 60%) and carbon dioxide (approximately 40%).

The formation of landfill gas can be influenced by various factors, e.g. composition of the waste, waste pre-treatment, site characteristics, local and regional climatic conditions, etc. These aspects vary greatly from site to site.

3.7.1 Degradation Process

The following distinct stages can be distinguished in a waste body depending on the waste characteristics:

Aerobic stage

In this phase, the oxygen present in the landfill is consumed in the (aerobic) degradation of organic compounds. This phase is relatively short (from several days to up to several weeks) since the quantity of oxygen, which is present, is limited.

Hydrolysis stage

This is the step in which the large organic molecules are converted into small soluble molecules such as lower fatty acids, simple sugars and amino acids.

Acetogenic stage

Under anaerobic conditions (absence of oxygen), hydrolysed compounds are degraded by bacteria into fatty acids. In this way, the acidity level (pH) is reduced. The gases that are formed in this phase are mainly hydrogen (H₂) and carbon dioxide (CO₂).

Methanogenic stage

In the methanogenic stage, the fatty acids formed are decomposed into mainly methane (CH₄) and carbon dioxide (CO₂). The methanogenic step can sometimes be reached after only a matter of months. However, it can also take years before the methane is formed. In contrast to the micro-organisms in the acidification phase, the methane forming bacteria are sensitive to sudden changes in the environmental conditions. It is important for this phase that, in all circumstances, the landfill remains under anaerobic conditions.

A landfill is highly heterogeneous. The stages described therefore occur simultaneously in a landfill. The rate of degradation is determined mainly by the temperature and the moisture content within the waste

body. Landfill gas generation can be initiated quite rapidly since a part of the organic material can be hydrolysed quickly. The temperature in the landfill remains initially rather high as the result of the heat released during the aerobic degradation (temperature rise to 30 - 50°C). Due to heat loss to the environment, the temperature falls after a period of time, to values that result in a far slower growth of methane forming bacteria. This fall in temperature occurs over a period of several years. Ultimately, the temperature reaches a level similar to the temperature of the environment.

Mobility of free water in the landfill body (leaching) ensures that enzymes and bacteria present in the water obtain access to the organic material that had so far not been degraded. The slow movement of water is one of the reasons that the formation process of landfill gas can take many years. Recirculation of leachate at the facility will help accelerate the process, resulting in earlier stabilisation of the landfilled material. In relatively dry circumstances, the degradation process decreases to a lower level, due to the lack of water movement. There is a low gas production however, because of the landfilled waste has a certain initial humidity and the degradation processes produces some water. Another possible origin of water is the humid atmospheric air that can cause condensation of water in the landfill body. As the gas is produced in a humid atmosphere, the gas is saturated with water.

3.7.2 Landfill Gas Extraction

The landfill gas is collected through a series of pipes which are fitted throughout the landfill and directed to a Landfill Gas Utilisation Plant (LFGUP) at the Drehid WMF as described below.

Stage 1 - Intermediate Gas Collection

An intermediate landfill gas collection system is implemented following commencement of placement of waste in the lined cells. Intermediate gas collection contributes towards effective odour control and ensures compliance with the *Circular Letter to all Landfills* dated the 20th June 2007 issued by the EPA, on the design and operation of landfills.

Stage 2 - Permanent Gas Collection

A permanent gas collection and treatment system will be installed at the site on final capping of each phase. The layout of the permanent landfill gas collection system is shown on Drawing No. 10369-2008.

Additional vertical gas extraction wells are drilled into the waste body following the placement of the temporary capping. This allows effective gas extraction during the period of settlement prior to and after installation of the final capping system. Typical details of the landfill gas collection infrastructure are shown in Drawing No. 10369-2007. The vertical gas wells consist of:

- A vertical shaft with diameters of 500 - 1,000 mm (diameter depending on utilisation of grabbing or drilling technique and on the depth of the landfill body above the bottom liner);
- A vertical, perforated (slotted) HDPE pipe of 160 – 200 mm diameter and length depending on position and depth of landfill;

- Surrounding gravel 16 – 50 mm;
- Telescopic construction to join the lower slotted pipe with the upper unperforated pipe and to allow for settlement;
- Vertical, closed (unperforated) HDPE pipe of 125 - 160 mm diameter and of length 2 – 3 m;
- Wellhead with monitoring facilities and regulator valve; and
- Bentonite sealing layer.

Landfill Gas Transport Pipelines

The landfill gas transport pipelines connect the gas wells to the LFGUP. The interconnecting pipe work will consist of a 90 mm diameter HDPE (SDR 17.6), 1.0 MPa (10 bar) pipe at the well. These pipes will connect to a gas manifold which in turn connects to a 355 mm diameter HDPE (SDR 17.6), 1.0 MPa (10 bar) gas main which surrounds the two landfill mounds (Phases 1 – 8 and Phases 9 – 15) and subsequently connects to the LFGUP.

Condensation of water in the landfill gas pipelines can potentially be problematic at landfill sites. Since the extracted gas is saturated with water, some condensation of water will occur as a result of the temperature decrease between the landfill body and the gas transport pipeline. Therefore, in order to prevent the pipelines from blockage with water, the pipeline must be laid to falls. At the lowest points in the pipeline and at strategic locations, special condensate traps will be installed to allow the pipes to drain into the landfill body. A typical landfill gas condensate trap is shown on Drawing No. 10369-2007.

As part of the installation works, all pipework on the gas collection system is pressure tested to confirm its integrity. Additionally, all valves and other fittings are tested to ensure that they are leak tight.

Gas Drainage/Equalising Layer

As an integral part of the landfill final capping system, a horizontal gas drainage/equalising layer is provided to collect landfill gas from the waste body. This drainage layer consists of geosynthetic gas drainage materials, e.g. EnkaDrain or equivalent. The primary purpose of this gas drainage layer is to allow for the landfill gas to migrate to the vertical landfill gas extraction wells.

Landfill Gas Utilisation

The landfill gas is collected through a series of pipes which are fitted throughout the landfill. Initially, the gas was directed to a series of flares which burned the gas to break down the methane. In late 2013, Bord na Mona opened a 5MW landfill gas utilisation plant at the Drehid facility. Methane gas generated during the decomposition of waste within the fully lined landfill is conveyed to the LFGUP where it is used as a fuel to generate electricity.

Currently, the electricity generation capacity of the LFGUP is greater than the maximum export capacity of the grid connection. In September 2016, the facility commenced the usage of excess electricity,

generated by the LFGUP, in the landfill, compost facility and service buildings. These facilities are now primarily powered by electricity generated on the site.

A mains electricity supply remains in place into the LFGUP to facilitate the export of electricity and to provide for the importation of electricity when the LFGUP is offline for maintenance and, therefore, not generating electricity.

3.8 CAPPING SYSTEM

The capping system implemented at the facility is outlined in the following sections. When each of the landfill phases is filled, a final cover is constructed on the waste body. In order to limit the risk of damage to the final cap due to waste settlement, a temporary cap comprised of clay is installed for a period of at least two years. During this period, the settlement of the waste body is measured on a regular basis. Once the settlement has sufficiently decreased and when weather conditions are favourable, the construction of the final capping system commences.

The final capping system has the following objectives:

- Minimise infiltration of water into the waste;
- Promote surface drainage and maximise run-off;
- Control gas migration; and
- Provide a physical separation between the waste body, plant and animal life.

The typical capping detail for the landfill is shown on Drawing No. 10369-2007. The specific detailed design of the capping system for each Phase is detailed in the SEWs submitted to the Agency prior to commencement of the works. The final cover consists of a number of different layers, namely:

- Top soil & Subsoil layer of minimum depth 1 m, consisting of local topsoil, subsoils and peat to support local vegetative growth;
- Surface water drainage layer, consisting of a geosynthetic layer. The drainage layer will have a hydraulic conductivity of more than 1×10^{-3} m/s and will incorporate a protection layer consisting of a woven geotextile (>750 g/m²) or similar with a high CBR puncture resistance;
- Continuous impermeable barrier layer consisting of a LLDPE liner (1.5 mm thick) or equivalent;
- Gas drainage/equalising layer consisting of geosynthetic gas drainage materials, e.g. EnkaDrain or equivalent.

In addition, in areas where trees are to be planted, a water permeable geotextile membrane will be placed above the drainage layer. The purpose of this geotextile membrane is to prevent root penetration through the drainage layer and into the barrier layer.

The shape of the landfill supports the final cover. Slopes will be no steeper than 1:3 for stability reasons. The slopes at the top of the landfill assist gravity drainage and limit the potential for the generation of perched water.

The working face and the inclined front face of the working cell is covered on a daily basis with natural soils won on-site, recovered C&D fines, stabilised biowaste or proprietary alternatives such as hessian, biodegradable geosynthetic sheets etc.

Intermediate cover for the landfill comprises, for instance, suitable C&D waste such as sub-soils and clays, which are installed, as required, to a depth of no less than 150 mm.

The temporary capping layer is constructed using locally sourced low permeability clay (clay borrow area on-site) or recovered C&D soils, which is installed in lifts of 150 mm to a total depth of 300 mm. The maximum amount possible of clay will be salvaged/won on-site for use in the final capping layer.

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4 DESCRIPTION OF REASONABLE ALTERNATIVES

4.1 INTRODUCTION

Chapter 4 of this EIAR provides a description of the reasonable alternatives as required in Directive 2014/52/EU. This requires “A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.”

As noted in the Draft Guidelines on the Information to be Contained in EIARs (August 2017) “Analysis of high-level or sectoral strategic alternatives cannot reasonably be expected within a project level EIAR” and “that the amended Directive refers to ‘reasonable alternatives... which are relevant to the proposed project and its specific characteristics’.”

In respect of this EIAR for the existing facility, the waste infrastructure technology, sizing and site location has been determined and constructed in accordance with the planning permission and EPA Licence requirements imposed. The discussion on reasonable alternatives in this Chapter is presented as the decisions made to determine the site location, layout, size and technology for the landfill as part of the original planning submission.

4.2 ALTERNATIVE LOCATIONS

Prior to submission of the planning application for the Drehid WMF in 2004, Fehily Timoney & Co. on behalf of Kildare County Council identified the site at Drehid, as the preferred site in County Kildare for the development of a landfill, satisfying the general criteria as set down (at the time) in Annex I of the EU Directive on Landfilling of Waste.

This was achieved by means of identifying a number of exclusionary areas and then ranking the remaining sites using a number of headings. This process led to the shortlisting of three sites namely, Usk, Newtowndonore and Drehid. Preliminary site investigations were carried out at each of the three sites. These activities included trial hole excavation, drilling, a geophysical survey, an archaeological survey and an ecological survey. The information gathered was then used to rank the three sites.

Drehid emerged as the most suitable site for a residual landfill due to:

- the large available land bank;
- the remoteness from dwellings;
- availability of clay and gravel locally; and
- the natural protection offered by the surficial deposits to the underlying bedrock aquifer. Their nature and thickness (>10m) gives a low vulnerability rating, and the most favourable groundwater protection scheme response.

The site selection report showed the Drehid site as the most suitable of the three sites shortlisted and the Preferred Site for the location of a residual landfill.

In addition, the baseline assessment for this project was completed prior to the design of the facility, which allowed for the optimisation of the siting of the facility, including the access road, within the overall Bord na Móna landholding of Timahoe Bog. In particular sensitive areas such as natural watercourses, areas of bogwoodland, potential archaeological sites and inferred geological faults etc. were avoided. The facility is also sited at a significant distance from the local road network and residential properties, with the nearest residence being approximately 1 km from the initial landfill footprint.

Specifically, with respect to the siting of the composting facility, it was advantageous to locate the facility adjacent to the landfill as there would be a need for cover material, capping material and compost for the landscaping measures proposed for the site. This offered a guarantee of an outlet for the compost facility output in the short-term which is employed today.

The phased development of landfill capacity at the existing facility is being carried out in accordance with the plans and layouts submitted for planning approval in 2004 and 2008. The continued development and operation of the Drehid WMF at this location is required to maintain available landfill capacity in the region and is in accordance with Policy WM18 of the Kildare County Development Plan 2017 – 2023 to “*facilitate the ongoing operation of the Drehid waste facility in so far as operations at the facility relate to the waste management needs of the county and the Eastern and Midlands Waste Region and subject to the protection of the environment, landscape character, road network and the amenities of the area*”.

4.3 ALTERNATIVE LAYOUTS

There was not a requirement to consider and document alternative layouts for the facility as part of the preparation of the EIS in 2004. Nonetheless, as outlined in the previous section, the landfill mounds layout was optimised to avoid sensitive environmental areas such as natural watercourses, areas of bogwoodland, potential archaeological site and inferred geological faults etc. The landfill mounds were also sited to ensure maximum distance from residential receptors and from the public road. The natural woodland and regenerating bog provides natural screening to the site which is complimented by specific landscape measures as set out in Chapter 8.

Additionally, the compost facility layout has been optimised to make use of common site road infrastructure and allow for the simple transfer of composted material to the landfill for use as cover material.

The phased development of landfill capacity at the existing facility is being carried out in accordance with the plans and layouts submitted for planning approval in 2004 and 2008. The layouts of the landfill phases have been incorporated into the existing infrastructure to make use of common services such as landfill gas infrastructure, leachate collection systems, surface water drainage and groundwater management. The layout of cells within the landfill phases is considered separately for each individual phase to

maximise the operational efficiencies. The layouts of gas collection infrastructure and leachate collection pipework in the landfill are carried out in accordance with the EPA Landfill Design guidance and are similar across each phase to ensure consistency.

4.4 ALTERNATIVE TECHNOLOGIES

It is acknowledged that disposal of waste to landfill is lowest preference for waste management on the waste hierarchy. This is due to a combination of regulatory, environmental and public pressures to find other avenues for managing municipal waste. Nonetheless, waste disposal by landfill is seen as an integral part of the EU Waste Management Hierarchy and will always be required, in some capacity, for the residual portion of the municipal waste stream, which cannot be handled by the more favourable options. The proposed further development of the Drehid WMF as set out in Proposed Development EIAR, outlines the need for landfill infrastructure to manage residual ash waste from the thermal treatment of municipal waste which highlights the ongoing need for landfill capacity in some form.

The annual waste intake permitted at the existing MSW Landfill was increased from 2008 to 2017 to allow for increasing demand for landfill capacity as other municipal waste landfills around the country began to close. The existing facility has permission to accept waste at a rate of 120,000 TPA until 2028 after which the MSW Landfill will be closed to incoming waste.

Alternative technologies and processes for biological treatment of waste were considered in the original EIS in 2004. In addition to composting, anaerobic digestion, vermiculture and ethanol production were considered. It was identified that the capital and operational costs of anaerobic digestion were significantly higher than for traditional composting and that there were operational complexities with vermiculture which also made traditional composting more preferable. At the time of preparation of the original EIS in 2004, the technology for ethanol production was not commercially viable.

Composting remains a popular form of biological treatment and the continued regulatory requirement to divert biodegradable waste from landfill means that there is a growing demand for composting facilities to treat organic waste. The tunnel composting treatment process was determined as suitable for Drehid on the basis of the high aeration rates and process control provided in this type of system. The chosen treatment process was also determined in cognisance of the EPA's stabilisation requirement for biodegradable waste, where stabilisation means the reduction of decomposition properties of the waste to such an extent that offensive odours are minimised and that the respiration activity after four days is less than 7 mgO₂/gDM.

This ongoing composting process is maintained at the facility in accordance with the current IED Licence and Department of Agriculture approval. As part of the proposed further development of the Drehid WMF, the existing compost facility will be extended to allow for an increased intake capacity to the plant. The success of the existing technology in treating incoming organic waste, as well as the recovery opportunities for the output material in the MSW Landfill, is paramount to the decision to extend the existing composting activities at the site.

5 BIODIVERSITY

5.1 INTRODUCTION

This EIAR has been prepared to update the previous EIS in accordance with the requirements of the new Environmental Impact Assessment (EIA) Directive (Directive 2014/52/EU) which came into effect on the 16th of May 2017. This chapter presents the Biodiversity Impact Assessment of the existing permitted development and should be read in conjunction with the site layout plans and project description section (Chapter 3) of the EIAR. Details of the existing baseline conditions on site are presented, along with an assessment of any likely effects as a result of the ongoing waste activities at the site. Mitigation measures are also recommended, where required. The aims of this assessment are to:

- obtain baseline biodiversity data for the site;
- determine the biodiversity value of the identified features;
- assess the effects of the ongoing activities on biodiversity features of value;
- recommend mitigation measures to avoid, reduce and remedy effects; and
- identify any residual effects post mitigation.

The existing permitted development is located within a larger Bord na Móna landholding, which comprises 2,544 hectares (ha) of mainly cutover bog. The existing permitted development area, to which this Existing Facility EIAR refers, is confined to an area of 179 ha which is the same area as was the subject of the previous EIS in 2008. A description of the existing permitted development is detailed in Chapter 3 and includes:

- Landfilling of non-hazardous residual waste up to 120,000 TPA; and
- Composting facility accepting up to 25,000 TPA.

This chapter has considered detailed information available from previous EISs and other data sources for this landholding.

This Biodiversity Chapter has been completed by Mr. Pádraig Cregg (BSc Zoology: National University of Ireland Galway, MSc Evolutionary and Behavioural Ecology: University of Exeter) Senior Ornithologist with TOBIN Consulting Engineers. The author is appropriately experienced and capable of undertake this assessment having worked on over 30 No. large infrastructure projects in both the UK (Scotland) and Ireland. Field surveys were carried out (June and August 2016 and July 2018) by Allison Austin (Senior Project Scientist) and Pádraig Cregg (Senior Ornithologist) respectively. Allison Austin has over ten years' experience working in Environmental Consultancy. Her experience has involved the energy industry, waste industry, extractive industry and residential and mixed-use developments.

The above field surveyors are experienced Environmental Consultants, whose data can be relied upon to provide a robust scientific basis on which to make this assessment.

5.2 METHODOLOGY

5.2.1 Legislations & Guidance

The following legislation has been considered in this assessment:

- Environmental Impact Assessment Directive 2014/52/EU;
- European Communities (EC) Birds Directive 2009/147/EC;
- EC Habitats Directive 92/43/EEC;
- EC Water Framework Directive 2000/60/EC;
- EC (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011; hereafter referred to as the Birds and Habitats Regulations);
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009);
- Convention on the conservation of European wildlife and natural habitats (Bern Convention) (Adopted in Ireland 01/08/1982);
- European Communities (EIA) Regulations, 1989 (as amended);
- Wildlife Act, 1976 and Wildlife (Amendment) Act (2000). In this document, the legislation is referred to collectively as the Wildlife Acts;
- Fisheries (Consolidation) Act, 1959;
- Flora (Protection) Order, 2015;
- Planning and Development Act, 2000 and Planning and Development (Amendment) Act, 2010; and
- National Biodiversity Plan, 2011 – 2016.

The potential for effects on nature conservation interests has been assessed taking into consideration habitats and the species that are likely to be affected by the existing permitted development. The approach included consideration and review (as appropriate) of the following guidance documents:

- A Guide to Habitats in Ireland (Fossitt - The Heritage Council, 2000);
- Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2002);
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003);
- Draft Revised Guidelines on the Information to be contained in Environmental Impact Statements, (EPA, 2015);
- Habitat Survey Guidelines: A Standard Methodology for Habitat Survey and Mapping in Ireland (The Heritage Council, 2005);
- Best Practice Guidelines for Habitat Survey and Mapping in Ireland (The Heritage Council 2011);
- Guidelines for Assessment of Ecological Impacts of National Roads Schemes (NRA, 2009);
- Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes (NRA, 2005);

- Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes (NRA, 2006);
- Guidelines for the Treatment of Otters prior to the Construction of National Roads Schemes; (NRA, 2006);
- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes; (NRA, 2006);
- Guidelines for the Treatment of Bats during the Construction of National Roads Schemes (NRA, 2006);
- Guidelines for Surveillance and Monitoring of European Bats (EUROBATS, 2010);
- Guidelines for Ecological Impact Assessment (Institute of Ecology and Environmental Management (IEEM, 2006);
- Requirement for the Protection of Fisheries Habitat During the Construction and Development Works at River Sites (Eastern Regional Fisheries Board);
- National Biodiversity Data Centre (www.biodiversityireland.ie); and
- Bord na Móna's Biodiversity Action Plan 2016-2021.

5.2.2 Consultation

Pre-application consultation meetings were held with KCC and the EPA in January 2008 as part of the preparation of the EIS for the facility. Consultation letters were also issued to relevant statutory bodies as identified in Section 1.7 of this EIAR.

Consultation carried out as part of the planning application for the proposed development works (submitted to ABP in December 2017) are detailed in Section 1.6 of the Proposed Development EIAR.

Consultation regarding the site and proposed development was also undertaken with Bord na Móna's Ecology Team. All relevant consultation responses have been fully taken into account in preparing this biodiversity impact assessment.

Additional consultation has been carried out as part of the preparation of this EIAR with the EPA.

5.2.3 Desk Study

The desk study for this project included the following steps:

- Identification of all sites designated for nature conservation within 15 kilometres (km) of the site;
- A review of all National Parks and Wildlife Service (NPWS) site synopses for designated sites within 15 km of the site, regarding potential effects;
- A species list for the Drehid study area was generated using the National Biodiversity Data Centre (www.biodiversityireland.ie) in order to determine if any rare or protected species have been recorded in this area and the likelihood of any such species being present at the site. A species

list for National Grid 10 km square N73 was also generated to determine if any rare or protected species occur in the wider Kildare area;

- Review of Ordnance Survey maps and aerial photography in order to determine the broad habitats that occur within the study area; and
- Review of relevant biodiversity and ecological reports and EIARs previously completed for the study area.

5.2.4 Field Survey

TOBIN Ecologists undertook a site visit on the 4th of July 2018 to confirm whether the conditions previously described (in the previous EIS (2008)) remain unchanged and thereby inform the biodiversity impact assessment for the existing permitted development.

5.2.4.1 Habitats and Flora

A habitat survey was undertaken in accordance with “*The Heritage Council’s Best Practice Guidance for Habitat Survey and Mapping*”²². Habitats were classified according to The Heritage Council’s *A Guide to Habitats in Ireland*²³ and following the EU Habitats Interpretation Manual for Annex I Habitats. A review of aerial photography of the study area assisted with habitat delineation and interpretation. Plant identification and nomenclature principally followed *Webb et al. (1996)*²⁴ and *Rose (1989)*²⁵. Predominant plant species were recorded in order to determine accurately the types of habitat present in the study area.

5.2.4.2 Fauna

Birds

A breeding bird survey was conducted at the existing facility on the 4th July 2018. Birds present were recorded by sight and/or by song/call. While all birds present were recorded, the focus was to record species of conservation concern, including species listed on Annex I of the EU Birds Directive and Red and Amber listed species of High and Moderate conservation concern, respectively²⁶.

Every effort was made to minimise disturbance risks that will potentially be caused by the human intrusion of undertaking the survey. Careful and regular stops and scans minimised potential disturbance risks and allowed rapid detection of species present, such as displaying birds.

²² Smith, G.F., O’Donoghue, P., O’Hora, K & Delaney, E. (2011). *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council.

²³ Fossitt, J. (2000). *Guide to Habitats in Ireland*. The Heritage Council

²⁴ Webb, Parnell & Doogue (1996). *An Irish Flora*.

²⁵ Rose (1989) *Colour Identification Guide to the Grasses, Sedges, Rushes and Ferns of the British Isles and north-western Europe*.

²⁶ Colhoun K. & Cummins S. (2013). *Birds of Conservation Concern in Ireland 2014-2019*. *Irish Birds* 9:523-544 (2013)

Mammals

The mammal survey primarily involved searching the study area for evidence/signs of mammals (e.g. tracks, scats, dwellings and occasionally direct sightings) during all biodiversity site visits. An assessment of the habitats, in terms of their importance for mammals, was also undertaken.

Other fauna

Checks for the presence of other protected fauna including; marsh fritillary (*Euphydryas aurinia*), common frog (*Rana temporaria*), smooth newt (*Lissotriton vulgaris*) and viviparous lizard (*Lacerta vivipara*), were also conducted during site visits.

5.3 RECEIVING ENVIRONMENT

5.3.1 Evaluation Criteria

Biodiversity resources/receptors are evaluated following NRA (2009) guidelines (refer to Table 5.1) which set out the importance of the resource/receptor in a geographic context. These guidelines are consistent with the approach recommended in the Guidelines for Ecological Impact Assessment in the United Kingdom (IEEM, 2006).

The IEEM (2006) guidelines define an ecologically significant impact as an impact (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographic area. The integrity of a site is the coherence of its ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified.

The following parameters are described when characterising likely effects (following IEEM (2006), EPA (2002) and NRA (2009)):

- **Direct and Indirect Impacts:** An impact can be caused either as a direct or as an indirect consequence of a proposed development;
- **Magnitude:** Magnitude measures the size of an impact, which is described as high, medium, low or very low;
- **Extent:** The area over which the impact occurs – this should be predicted in a quantified manner;
- **Duration:** The time for which the impact is expected to last prior to recovery or replacement of the resource or feature;
 - Temporary: Up to 1 Year;
 - Short Term: The effects would take 1-7 years to be mitigated;
 - Medium Term: The effects would take 7-15 years to be mitigated;
 - Long Term: The effects would take 15-60 years to be mitigated; and
 - Permanent: The effects would take 60+ years to be mitigated.
- **Likelihood:**

- Certain/Near Certain: >95% chance of occurring as predicted;
- Probable: 50-95% chance as occurring as predicted;
- Unlikely: 5-50% chance as occurring as predicted and
- Extremely Unlikely: <5% chance as occurring as predicted.

Table 5.1: Criteria for Establishing Receptor Importance (NRA, 2009)

Importance	Ecological Valuation
International Importance	<ul style="list-style-type: none"> • European Site including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. • Proposed Special Protection Area (pSPA) – site that fulfils the criteria for designation as a ‘European Site’ (see Annex III of the Habitats Directive, as amended). • Features essential to maintaining the coherence of the European Network. • Site containing ‘best examples’ of the habitat types listed in Annex I of the Habitats Directive. • Resident or regularly occurring populations (assessed to be important at the national level) of the following: <ul style="list-style-type: none"> ○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. • Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). • World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). • Biosphere Reserve (UNESCO Man & The Biosphere Programme). • Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). • Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). • Biogenetic Reserve under the Council of Europe. • European Diploma Site under the Council of Europe. • Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National Importance	<ul style="list-style-type: none"> • Site designated or proposed as a Natural Heritage Area (NHA). • Statutory Nature Reserve. • Refuge for Fauna and Flora protected under the Wildlife Acts. • National Park. • Undesignated site fulfilling the criteria for designation as a NHA. • Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Acts; and/or a National Park. • Resident or regularly occurring populations (assessed to be important at the national level) of the following: <ul style="list-style-type: none"> ○ Species protected under the Wildlife Acts; and/or ○ Species listed on the relevant Red Data list. • Site containing ‘viable areas’ of the habitat types listed in Annex I of the Habitats Directive.
County Importance	<ul style="list-style-type: none"> • Area of Special Amenity. • Area subject to a Tree Preservation Order.

Importance	Ecological Valuation
	<ul style="list-style-type: none"> • Area of High Amenity, or equivalent, designated under the County Development Plan. • Resident or regularly occurring populations (assessed to be important at the County level) of the following: <ul style="list-style-type: none"> ○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; ○ Species protected under the Wildlife Acts; and/or ○ Species listed on the relevant Red Data list. • Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance. • County important populations of species or viable areas of semi-natural habitats or natural heritage features identified in the National or Local Biodiversity Action Plan (BAP), if these have been prepared. • Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county. • Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
Local Importance (Higher Value)	<ul style="list-style-type: none"> • Locally important populations of priority species or habitats or natural heritage features identified in the local BAP, if this has been prepared. • Resident or regularly occurring populations (assessed to be important at the Local level) of the following: <ul style="list-style-type: none"> ○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; ○ Species protected under the Wildlife Acts; and/or ○ Species listed on the relevant Red Data list. • Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality; • Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
Local Importance (Lower Value)	<ul style="list-style-type: none"> • Sites containing small areas of semi-natural habitat that are of some local importance for wildlife. • Sites or features containing non-native species that is of some importance in maintaining habitat links.

5.3.2 Designated Conservation Sites

There are no sites designated under the EU Habitats Directive and EU Birds Directive, i.e. Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), located within the footprint of the existing facility (Table 5.2). The nearest designated site is Hodgestown Bog (NHA) located at a distance of 3.5 km. The Grand Canal (pNHA) is not currently designated but for planning purposes it is treated as a designated site.

A Screening Statement for Appropriate Assessment (as per EU Habitat Directive requirements) was completed and was submitted alongside the planning application for the proposed development works at the Drehid WMF in December 2017 (ABP Ref. No. 300506). Subsequent to submission of the planning application for the proposed further development works and in light of the recent decision of the European Court of Justice in *Case C-323/17 People Over Wind v Coillte*, it is now concluded that an Appropriate Assessment is required for the Proposed Development. The updated AA Screening and Natura Impact Statement (NIS) submitted to An Bord Pleanála is included in Appendix 5.1.

Figure 5.1 illustrates the location of designated conservation sites within 15 km of the existing site. Distances from each designated conservation site to the existing facility are provided in Table 5.2.

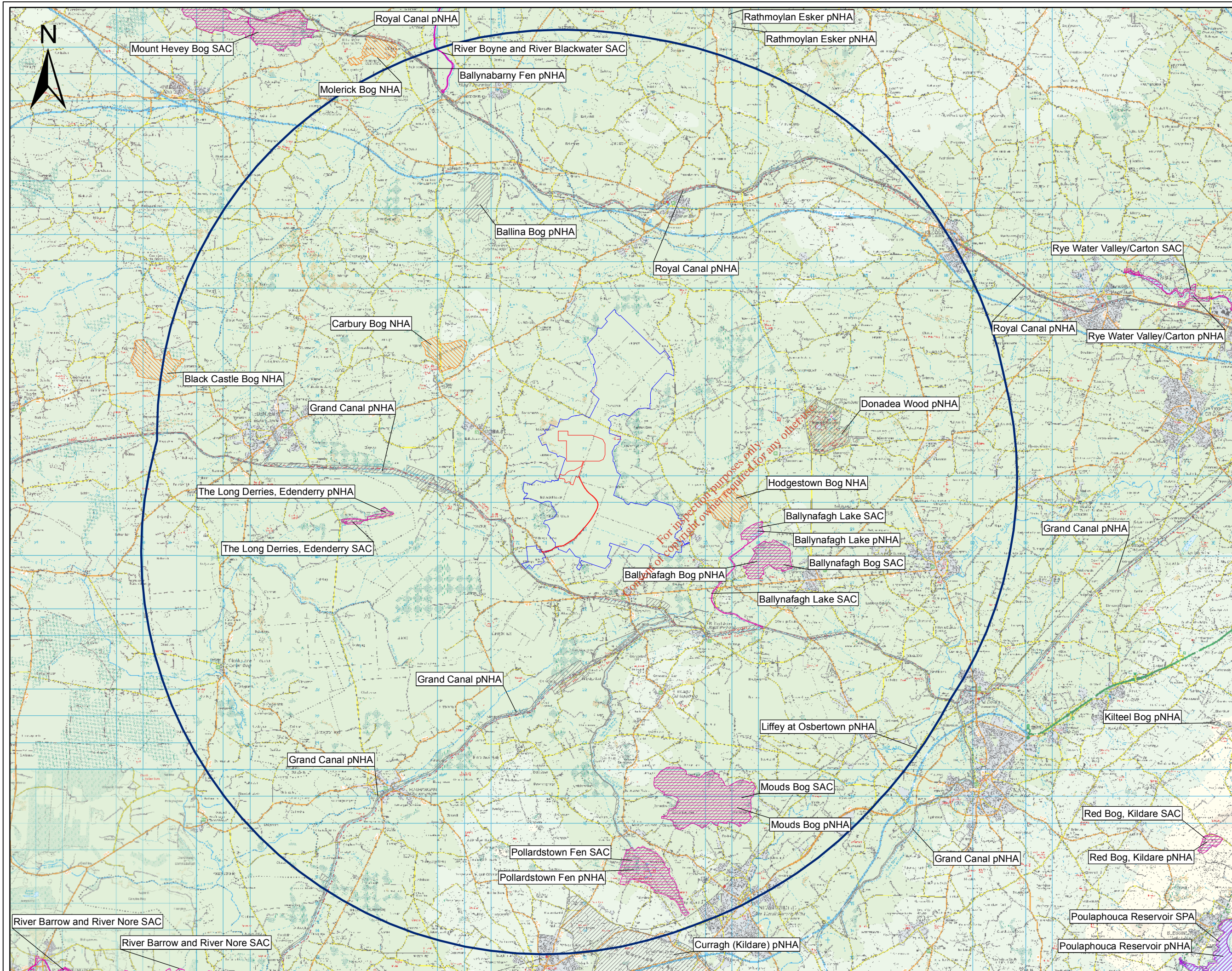
Table 5.2: Designated conservation areas located within 15 km of the site

Name	Site Code	Designation	Approximate distance from site/activity boundary (km)
River Boyne and Blackwater	004232	SPA	14.4
River Boyne and Blackwater	002299	SAC	14.4
Ballina Bog	000390	pNHA	9.5
Ballynafagh Bog	000391	pNHA/SAC	5.9
Ballynafagh Lake	001387	pNHA/SAC	5.3
Carbury Bog	001388	NHA	5.7
Donadea Woods	001391	pNHA	7.5
Grand Canal	002104	pNHA	3.2
Hodgestown Bog	001393	NHA	3.5
Long Derries, Edenderry	000925	pNHA/SAC	7.0
Royal Canal	0002103	pNHA	9.1
Mouds Bog	000395	pNHA/SAC	11.1
Pollardstown Fen	000396	pNHA/SAC	13.9
Liffey at Osberstown	001395	pNHA	15.2

Note: NHA = Natural Heritage Area (Nationally Designated Site)

pNHA = proposed Natural Heritage Area (not currently designated but recognised in County Development Plans)

SAC = Special Area of Conservation (European Designated Site)

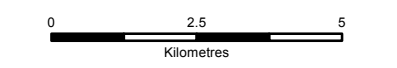


Legend

- Site Boundary
- Bord na Móna Ownership Boundary
- 15 Km Buffer from Site Boundary

Protected Sites

- Special Area of Conservation
- Proposed Natural Heritage Areas
- Natural Heritage Areas
- Special Protection Areas



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

Rev A	Date	Description	By	Chkd.
July '18		EIAR Issue	F.H.	R.H.

Client:
BORD NA MÓNA
 Naturally Driven

Project:
 EXISTING
 DREHID WASTE
 MANAGEMENT FACILITY

Title:
 Designated Conservation Areas
 Within 15 Kilometre Buffer

Scale @ A3: 1:130,000

Prepared by: F.Healy Checked: R. Hunt Date: July 2018

Project Director: D.Grehan

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Rev: **A**

Figure 5.1

5.3.3 Rare and Protected Flora

The site is located in the Ordnance Survey National Grid 10 km square N73. A species list for the Drehid area was generated using the National Biodiversity Data Centre (www.biodiversityireland.ie) in order to determine if any rare or protected species have been recorded in this area and the likelihood of their being present at the site. There are no historical records of rare or protected flora occurring within the facility area and no rare and protected flora were observed in the study area during surveys.

A species list for National Grid 10 km square N73 was also generated to determine if any rare or protected species occur in the wider Kildare area. Table 5.3 presents the relevant data for these species as recorded in this grid square.

Table 5.3: Protected or Rare Plants

Species	Status	Category
Bog Rosemary, (<i>Andromeda polifolia</i>)	Not Protected	Species not Considered Threatened in the Republic of Ireland but protected in NI
Cowslip (<i>Primula veris</i>)	Not Protected	Species not Considered Threatened in the Republic of Ireland but protected in NI

Neither bog rosemary nor cowslip were recorded during the site visits conducted in July 2018.

5.3.4 Habitats within the existing permitted development and wider surroundings

Habitat surveys undertaken throughout the site identified no protected habitats or any alignment with Annex I habitat classifications. Habitats within the site were evaluated as not being of any significant ecological value. Habitat types identified within the site are summarised below:

- FW4 – Drainage Ditches
- GS2 – Dry meadows and grassy verges
- ED2 – Exposed Bare Ground
- ED3 – Recolonised Bare Ground
- FL8 – Man-made Pond
- BL3 – Buildings and artificial surfaces

Drainage ditches (FW4)

There are several drainage ditches within the existing permitted development site boundary. Internal roads run around the perimeter and bisect the landfill in two; these roads are flanked to either side by drains. The inner most drains also fringe the base of the landfill embankments. They have relatively steep banks and are up to 2 m wide. During the survey, they generally contained 0 to 30 cm of water. Water in the drains flowed towards the four surface water attenuation lagoons to the west of the administration

buildings. Bulrush (*Typha latifolia*) and broad leaved pondweed (*Potamogeton natans*) were recorded at several locations within the drains. The drainage ditches on site are not regularly maintained and, as a result, are being encroached upon to varying extents by the adjacent vegetation. In places the drains have been encroached by soft rush (*Juncus effuses*), field horsetail (*Equisetum arvense*) and willow (*Salix spp.*).

Dry meadows and grassy verges (GS2)

This habitat fringes internal roads, on the embankment of the landfill and on capped sections of the landfill itself within the existing permitted development site. The dominant species was perennial rye grass (*Lolium perenne*) and meadow foxtail (*Alopecurus pratensis*). Other species present include cocksfoot (*Dactylis glomerata*), common nettle (*Urtica dioica*), greater plantain (*Plantago major*), bramble (*Rubus fruticosus* agg.), tree saplings (predominantly willow spp.), great willowherb (*Epilobium hirsutum*), ribwort plantain (*Plantago lanceolata*), dock (*Rumex sp.*), creeping buttercup (*Ranunculus repens*), silverweed (*Potentilla anserina*), colt's foot (*Tussilago farfara*), spear thistle (*Cirsium vulgare*), teasel (*Dipsacus fullonum*) and creeping thistle (*Cirsium arvense*). There are existing access tracks running through this habitat.

Exposed Bare Ground (ED2)

This habitat is present on several of the embankment of the landfill and comprises bare ground with some re-vegetated. The north easterly corner of the Drehid WMF consists of disturbed ground and soil heaps. It is currently used as a storage area. As is typical for this habitat type, very little vegetative cover was noted during surveying.

Re-colonising bare ground (ED3)

This habitat category is used for areas of bare or disturbed ground which is re-colonising with vegetation. Vegetation cover is greater than 50% with ruderals or weed plants dominating. In common with ED2, this habitat is present in disturbed areas on site. Species present include colt's-foot, silverweed, creeping thistle, creeping buttercup, field horsetail, great willowherb, ribwort plantain, common nettle, cock's-foot, spear thistle, red clover (*Trifolium pratense*), bracken, soft rush, bramble, hares-tail cotton grass and meadow foxtail.

FL8 – Man-made Pond

This category is used to describe a series of surface water attenuation lagoons to the west of the site, and west of the existing administration building. It was created as part of the existing permitted development and collects the surface water runoff from the existing landfill and hardscape through the network of onsite drains.

Buildings and artificial surfaces (BL3)

This habitat incorporates existing infrastructure including the waste facility entrance and internal roads, car park and buildings.

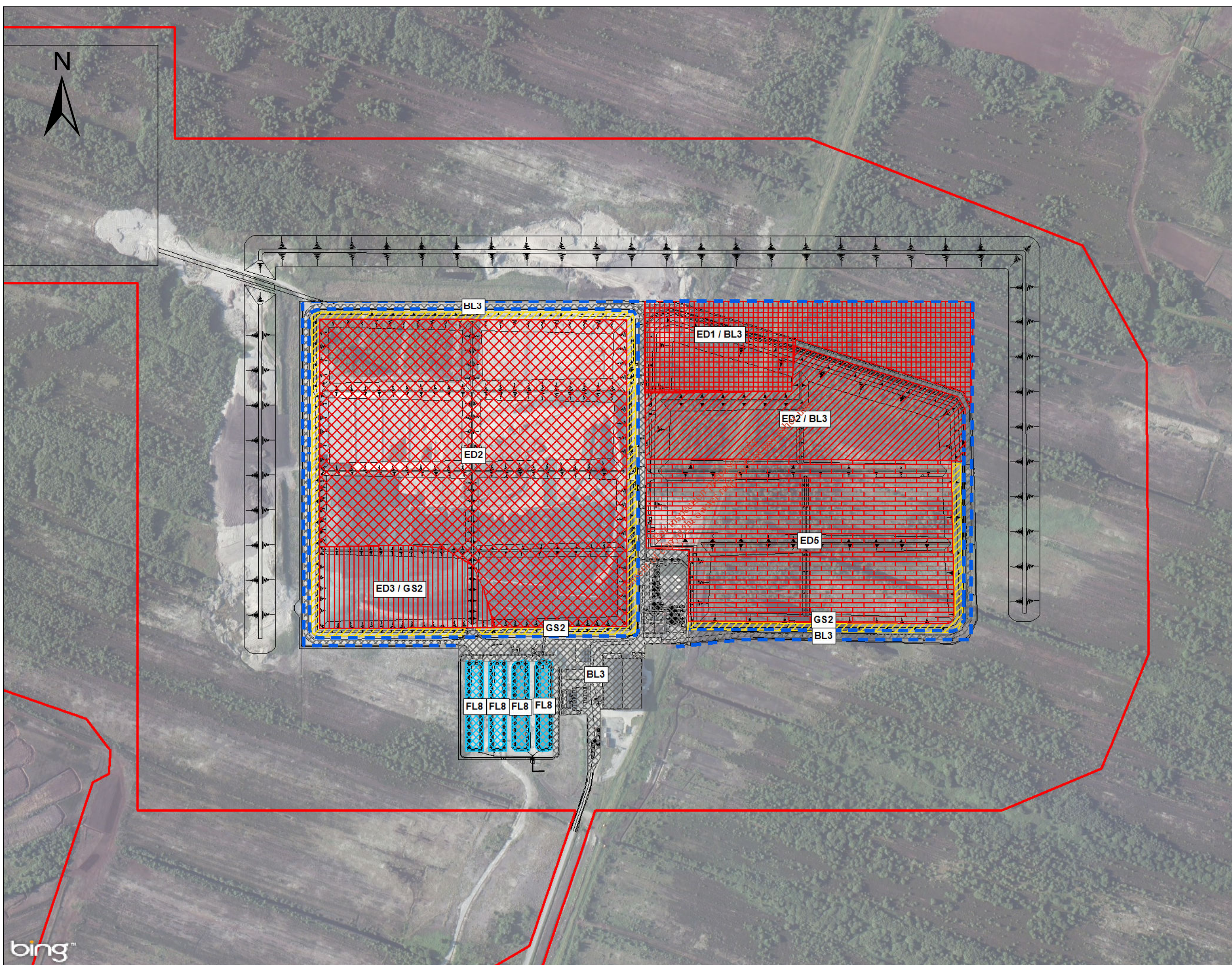
The wider surroundings

Bord na Móna intends to further develop the existing Drehid WMF and submitted a planning application to ABP (ABP Ref. No. 300506) for the proposed works on the 20th of December 2017. The proposed further development will be situated within a Bord na Móna landholding which includes the existing Drehid WMF and permitted (but not yet built) MBT Facility. This landholding was previously used by Bord na Móna for commercial peat extraction. In general, habitats on site are typical of re-vegetating cutover bog with heath/scrub/woodland habitats on a relatively well drained portion of the overall Bord na Móna landholding.

Habitats in the wider surroundings of the existing permitted development site were classified in accordance with Fossitt (2000). Twelve habitat classes and habitat mosaics (habitat consisting of a mix of habitat classes) were determined including:

- Drainage ditches (FW4);
- Wet heath (HH3);
- Bog woodland (WN7);
- Scrub (WS1);
- Bog woodland (WN7), Wet heath (HH3) / Scrub (WS1) mosaic;
- Wet heath (HH3) / Scrub (WS1) mosaic;
- Dry siliceous heath (HH1);
- Dry meadows and grassy verges (GS2);
- Buildings and artificial surfaces (BL3);
- Spoil and bare ground (ED2);
- Other artificial lakes and ponds (FL8); and
- Re-colonising bare ground (ED3).

For further information on the wider surroundings, refer to the Proposed Development EIAR (2017) submitted with the application to the EPA for a new IED Licence for the overall facility.



Legend

Boundaries_ITM

Habitats

- BL3 - Buildings and artificial surfaces
- ED1 / BL3 - Exposed sand, gravel or till
- ED2 - Spoil and bare ground
- ED2 / BL3 - Spoil & bare ground / Buildings & artificial surface
- ED3 / GS2 - Recolonising bare ground / Dry meadows & grassy verges
- ED5 - Refuse and other waste
- FL8 - Other artificial lakes and ponds
- GS2 - Dry meadows and grassy verges
- FW4 - Drainage Ditches



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

Rev	Date	Description	By	Chkd.
Rev A	July '18	EIAR Issue	MN	RH

Client:
BORD NA MÓNA
 Naturally Driven

Project:
 EXISTING
 DREHID WASTE
 MANAGEMENT FACILITY

Title:
 HABITAT MAP

Scale @ A3: 1:5,000

Prepared by: M. Nolan	Checked: R. Hunt	Date: July 2018
Project Director:		D. Grehan

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Figure 5.2 Rev: A

5.3.5 Fauna

Breeding Birds

Breeding was not confirmed for bird species listed on Annex I of the Birds Directive, within the site boundary or in the wider environs of the site during site visits.

No species of high (red listed) conservation concern were recorded within the site boundary during site visits. Meadow pipit (*Anthus pratensis*; red listed) calling and display flights were noted adjacent to the existing facility within the overall Bord na Móna land holding.

Several bird species of moderate conservation concern (amber listed) were observed flying in the vicinity of the site. This included Skylark (*Alauda arvensis*), Mistle thrush (*Turdus viscivorus*), Linnet (*Carduelis cannabina*), Swallow (*Hirundo rustica*), House martin (*Delichon urbicum*) and Robin (*Erithacus rubecula*). No confirmed nesting areas were noted on site for these birds. Several Swallow and House martin nests were noted around the main site office and existing buildings further north.

Common bird species (green listed) recorded within the existing Drehid WMF and adjacent areas included Willow warbler (*Phylloscopus trochilus*), Whitethroat (*Sylvia communis*), Blackcap (*Sylvia atricapilla*), Wren (*Troglodytes troglodytes*), Song thrush (*Turdus philomelos*), Blackbird (*Turdus merula*), Pied wagtail (*Motacilla alba*), Reed bunting (*Emberiza schoeniclus*), Chaffinch (*Fringilla coelebs*) Woodpigeon (*Columba palumbus*), Pheasant (*Phasianus colchicus*) and Mallard (*Anas platyrhynchos*). Suitable breeding habitat for these species was recorded fringing the existing permitted development site; it is therefore likely that these birds nest in this area. A Buzzard (*Buteo buteo*) was noted flying to the north and east (off site) within the overall Bord na Móna land holding. Some Raven (*Corvus corax*) flight activity and a begging call was noted outside of the site boundary to the east. This could mean that a Raven nest is present deep within the conifer woods (off-site).

A large corvid population (mainly Rook [*Corvus frugilegus*] and Hooded crow [*Corvus cornix*]) was recorded roosting in the Drehid area, along with Lesser black-back gulls (*Larus fuscus*) and Greater black-back gulls (*Larus marinus*).

As part of the ecological assessment, a review of previous breeding bird surveys (completed in 2012, 2013 and 2014) conducted within the overall Bord na Móna site, was also undertaken. One red listed species, Whinchat (*Saxicola rubetra*), was recorded in 2013. Amber listed species previously recorded in the wider area included Mute swan (*Cygnus olor*), Teal (*Anas crecca*), Little Grebe (*Tachybaptus ruficollis*), Snipe (*Gallinago gallinago*), Woodcock (*Scolopax rusticola*), Sparrowhawk (*Accipiter nisus*), Goldcrest (*Regulus regulus*), Grasshopper warbler (*Locustella naevia*), Wheatear (*Oenanthe oenanthe*) and Linnet (*Carduelis cannabina*).

All birds and their nesting places are protected under the Irish Wildlife Act (1976) and under the Irish Wildlife Amendment Act (2000) except for excluded species.

Wintering Birds

A desktop study of previous winter bird studies (2012/2013 and 2013/2014) conducted within the overall Bord na Móna landholding by Biosphere Environmental Services, was also undertaken as part of the preparation of the Proposed Development EIAR in 2017. These studies involved a combination of transect and vantage point surveys.

Birds of conservation concern recorded in the area during winter 2012/2013 included Mute swan, Teal, Little Grebe, Tufted duck (*Aythya fuligula*), Lapwing (*Vanellus vanellus*) and Snipe. Birds of conservation concern recorded in the area during winter 2013/2014 included Whooper swan (*Cygnus cygnus*), Golden plover (*Pluvialis apricaria*), Mute swan, Teal, Little Grebe and Lapwing.

The existing pond area within the Bord na Móna landholding (southwest of the existing facility) is likely to be a key attraction for these winter bird species.

Bats

The habitats present within the existing permitted Drehid WMF are considered to be sub-optimal (e.g. no hedgerows or woodland) and therefore of limited ecological value to bat species.

Field surveys as part of the Proposed Development EIAR identified four bat species present adjacent to the existing permitted development (Table 5.4). No potential bat roost sites were identified. All records were identified outside of the emergence/re-entry periods (post-dusk and pre-dawn).

Table 5.4: Summary of Species Found on Site during Static and Transect Survey Work

Species	Scientific Name	Abundance
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	31
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	74
Leisler	<i>Nyctalus leisleri</i>	100
Daubenton	<i>Myotis daubentonii</i>	5

For further information on bat activity in wider surroundings of the existing development please refer to the Proposed Development EIAR.

Other Mammals

No badger (*Meles meles*) signs were recorded within the existing facility site. However, badger tracks and foraging signs were recorded during survey visits for preparation of the Proposed Development EIAR at several locations around and within the wider surroundings of the existing facility. In the EIS submitted by Bord na Móna in 2012, for the development of an MBT facility within the Drehid landholding, an outlier sett was noted to be present within the proposed footprint of the MBT facility; however, no setts were recorded during the 2016 site visits.

No evidence of otter (*Lutra lutra*) spraints (droppings) or a holt (breeding site) was noted within the existing facility site area or wider surroundings. It is possible that otters venture into the area, but they are unlikely to remain as the drainage ditches within the site do not appear to support strong populations of suitable prey items for otters.

No other mammal activity was noted within the existing facility site area. During the surveys carried out for the Proposed Development EIAR in 2017; signs of fox (*Vulpes vulpes*), rabbit (*Oryctolagus cuniculus*) and Irish hare (*Lepus timidus hibernicus*) were noted within the wider surrounding of the existing site. Irish hare is a protected species under the Irish Wildlife Acts although it can be hunted under licence issued by NPWS.

Other Fauna

The drainage ditches noted at the base of the landfill embankments are considered suitable for common frogs and smooth newts, however none were noted during the July 2018 site visit.

During the same site visit, stickleback fish were recorded within the drains at the base of the landfill embankments.

For further information on the fauna in wider surroundings of the existing development please refer to the Proposed Development EIAR.

5.3.6 Biodiversity Evaluation

There are no sites designated under the EU Habitats Directive and EU Birds Directive, i.e. SACs and SPAs located within the footprint of the existing facility site. The nearest site to the facility designated for nature conservation is Hodgestown Bog (NHA) at c. 3.5 km.

An Appropriate Assessment screening was carried out in November 2018 and considered potential impacts which may arise during the construction and operational phases of the proposed further development of the Drehid WMF. In light of recent European Court of Justice case law, protective measures that would avoid/reduce predicted impacts were not considered during the screening assessment.

It is considered that an Appropriate Assessment is required as it cannot be excluded, on the basis of objective information, that the development, individually or in combination with other plans or projects will not have a significant effect on the River Barrow and River Nore SAC. Indirect effects have been identified from the proposed development both alone and in-combination with other existing and permitted developments and discharges from cutaway bog within the wider landholdings of Bord na Móna.

Consequently, a Natura Impact Statement has been prepared for the River Barrow and River Nore SAC. It is considered, on the basis of objective information and in light of best scientific knowledge in the field, that the development individually or in combination with other plans or projects will not have an adverse

effect on the integrity of the River Barrow and River Nore SAC in view of the site’s structure, function and conservation objectives.

No International, National or County significant habitats occur within the existing permitted development site. No rare or protected plants were recorded. No evidence was found of badger use of the existing permitted development site. Surveys as part of a previous planning application noted low numbers of bats using habitats within the wider surroundings of the existing development for foraging and commuting purposes. No bat roosts were identified during these surveys. No Annex I or red listed birds were recorded on site. Habitats present on site are considered of limited value to the local avian community. However, the surroundings area is considered to contain habitat suitable for some recorded red/ amber listed avian species namely Meadow pipit, Linnet, Skylark, Mistle thrush and Robin, along with various common bird species. Nest sites were confirmed for House Martin and Swallow within the existing permitted development area during site visits.

The existing permitted development site largely consists of artificial surfaces, disturbed ground and embankments which can be categorised into six habitat classes. Habitats and their evaluation rating are detailed in Table 5.5.

Table 5.5: Habitat Evaluation

Habitat Classification	Evaluation
Drainage Ditch (FW 4)	Local Importance (Lower Value)
Man-made Pond (FL8)	
Dry meadows and grassy verges (GS2)	
Re-colonising bare ground (ED3)	
Exposed bare ground (ED2)	Not evaluated
Buildings and artificial surfaces (BL3)	

Habitats within the existing facility are evaluated as of Local Importance (Lower Value). These habitats already form a part of the existing facility and are therefore not in line to be altered in any significant way. In the absence of marked changes in operational practises, impacts on these lower value habitats are not predicted.

Key biodiversity receptors requiring consideration in terms of likely effects and necessary mitigation are summarised as follows:

- Designated sites;
- Badgers;
- Bats;
- Breeding bird species; and

- Common frog and smooth newt.

5.4 POTENTIAL EFFECTS

5.4.1 Overview of Effects

Given that this EIAR is being submitted to the EPA as part of an IED Licence Application and is an updated impact assessment appraisal from the EIS submitted to ABP in 2008; impacts will only be assessed for operational stage works.

Operational stage works are likely to include minor disturbance to fauna species. Potential effects are likely to result from activities related to the maintenance and operation of the facility (i.e. increased noise, traffic and daily human presence in existing facility).

The assessment of effects and the magnitude of their significance should be considered in the context of the wider Bord na Móna landholding of 2,544 ha. In the present case, with the existing facility and given the proposed plans for further development at the Drehid WMF; 2,272 ha of the landholding will remain undeveloped. The undeveloped portion of the landholding consists of discrete semi-natural habitats.

5.4.2 Potential Effects during Construction Phase

The operation of the existing development includes some construction activities, i.e. to provide new landfill capacity within the existing permitted development boundary. These construction activities can reasonably be considered part of operation phase of the development. See Section 5.4.3 for further details of operational phase impacts.

5.4.3 Potential Effects during Operational Phase

Given the requirement for lighting within the existing facility; there is a potential to effect foraging bats, as excessive lighting and “spill over” of light into surrounding habitats can alter foraging routes and areas utilised. Some bat species require dark conditions for effective foraging.

The nature of the waste materials processed at the existing facility is likely to attract wildlife including pest species (e.g. rodents) which will require pest control activities. Indirect effects from possible control procedures to predator species (e.g. birds of prey and protected mammals) will require consideration to minimise indirect effects to species in the wider local area.

The routine action of personal and machinery within the existing facility may result in disturbance for local fauna (i.e. badgers, breeding birds, common frogs and smooth newts). However, given disturbance from the existing facility is not associated with accompanying immediate danger suggests that animals should be able to habituate to the disturbance over time. It is therefore considered that any possible impacts will be temporary in nature. Furthermore, it is considered that local fauna are likely to be now habituated to the status quo at the existing facility.

No collision or other effects with any structures at the existing facility are expected for bird species of conservation significance in the wider local area, including designated sites.

During the operation of the facility, there is potential for pollution of watercourses through leachate from the landfill, contaminated run-off from the hard-standing areas and wheel wash areas. Details on the potential impacts on water quality and the potential hydrological connectivity of the existing facility area with local ecological features (post mitigation) are addressed in Chapter 7 (Water) of this volume of the EIAR.

The potential for cumulative/in-combination effects are set out in detail in the Proposed Development EIAR submitted to ABP and Natura Impact Statement included in Appendix 5.1. These reports accompany this submission to the EPA as part of an IED License Application and address the consideration of cumulative effects.

5.5 DO NOTHING SCENARIO

Given that this EIAR is being submitted to the EPA as part of an IED Licence Application and is an updated impact assessment appraisal from the EIS submitted to ABP in 2008; the baseline of an existing waste management facility as detailed in Section 5.3 will remain. Fauna species will continue to use the site and adjacent suitable habitats.

5.6 MITIGATION MEASURES

5.6.1 Operational Phase

- External lighting has been minimised in its extent and usage as much as possible, so as to minimise disturbance to foraging bats. Where feasible, external lights should be cowled and limited only to areas where lighting is strictly required (as per Health and Safety minimum requirements); and
- Vermin control measures.

5.7 RESIDUAL EFFECTS

The key issue in determining the significance of residual effects is the expected timeframe of recovery for key biodiversity receptors.

Following the implementation of the mitigation measures presented above, predicted residual effects for the key biodiversity receptors are not expected to be significant. Only minor short-term effects to fauna species on site are expected. As the existing waste facility and entrance road are operational daily, local fauna species will already be acclimatised to an extent with regards to noise, traffic and human activity in the area.

5.8 CONCLUSIONS

The existing facility occupies an area of 152 ha, within the overall 2,544 ha Bord na Móna landholding. The habitats of the existing facility are no longer representative of the those found within the wider landholdings.

The existing permitted development site largely consists of artificial surfaces, disturbed ground and embankments which can be categorised into six habitat classes. These habitats are evaluated as of local importance (lower value). This evaluation limits the potential for ecological significant effects.

The existing facility will not have any effects on any sites designated for conservation or protected flora.

House Martin and Swallow are noted to utilise the main administration office and adjacent buildings for nesting. These birds have habituated to the activity of personal and machinery within the existing facility. In the absence of marked changes in operational practises, this situation is not expected to change.

No other confirmed bird nesting sites were recorded within the existing facility although it is likely that some red and amber listed bird species do nest in habitats fringing the site. Given the existing facility has been in operation since 2008 and red and amber listed birds currently utilise the wider surroundings of the facility for breeding, it is considered likely that habituation to potential disturbance impacts has occurred. In the absence of marked changes in operational practises, this situation is not expected to change.

Badger currently uses the wider surroundings of the existing facility for foraging. Given the existing facility has been in operation since 2008 and badgers currently utilise the wider surroundings of the facility for foraging, it is considered likely that habituation to potential disturbance impacts has occurred. In the absence of marked changes in operational practises this situation is not expected to change.

Low numbers of bats use adjacent areas for foraging and commuting purposes, as per surveying carried out in preparation of the Proposed Development EIAR. Given the availability of suitable habitat for bats in the wider surroundings, the small scale of the existing Drehid WMF relative to the overall landholding and the high mobility of bats; significant effects on bat species are not foreseen. Mitigation measures are set out to minimise external lighting at night as far as possible to minimise disturbance to foraging bats during the routine operation of the facility.

As the existing waste facility and entrance road are in daily operation, other local fauna species are likely to have already habituated to noise, traffic and human activity in the area.

In general, local populations of fauna will not be significantly affected as larger areas of alternative habitat are present surrounding the existing permitted facility within the overall landholdings. Proposed mitigation measures outlined in this Chapter will seek to reduce any effects of the waste facility during operational phases on the biodiversity within the wider landholding.