2.0 DESCRIPTION OF THE EXISTING INFRASTRUCTURE AND PROPOSED DEVELOPMENT

This section of the EIAR describes the existing waste management infrastructure in place at the Drehid WMF and describes the proposed development, which is the subject of this application.

In accordance with Article 5, Paragraph 1 of the EIA Directive, the information to be provided in this EIAR, is required to include:

> *"(a) A description of the project comprising information on the site, design, size and other relevant features of the project."*

Annex IV, Paragraph 1 of the EIA Directive further expands on this, stating that the information required for the EIAR is:

> *"Description of the project, including in particular:*
>
> (a) a description of the location of the project;
>
> (b) a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
>
> (c) a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;
>
> d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases. *"*

This required information is mainly set out in this Chapter of the EIAR. Information on land use changes is set out in Chapter 9 (Material Assets) and discussion with regard to habitat loss and biodiversity is presented in Chapter 6 (Biodiversity).

Emissions to soils/subsoils, water and air is discussed in the relevant Chapters (Chapters 7, 8 and 12, respectively) and the expected noise and vibration emissions are discussed in Chapter 10 (Noise & Vibration). Emissions of light are discussed in Chapter 6 (Biodiversity). Heat and radiation emissions are not relevant in respect of this proposed development.

Waste generation during the construction and operational phases is discussed in Chapter 9 (Material Assets).

The EPA *Guidelines on the information to be contained in Environmental Impact Assessment Reports* (2022) also provide guidance on the approach to the project description, stating in Section 3.5.1 that:

> *"The EIAR needs to describe the dynamics, for example, of the construction and day-to-day operations, as well as the use, disposal and transformation of materials in ways that traditional static descriptions of structures, layouts and land-uses do not."*

In relation to the description of construction, Section 3.5.3 of the EIAR Guidelines (Description of Construction) also states:

> *"Effects during construction can often be more significant than those that arise during the operational life of a project. Larger projects can take several years to complete. During this period, there may be numerous significant effects. The description includes, but is not limited to:*
>
> - *construction phase land use requirement;*
> - *proposed works and construction methods;*
> - *duration and timing, including any phasing proposals;*
> - *environmental protection measures; and*
> - *Construction Environmental Management Plan (CEMP)."*

These aspects are descried within this Chapter in the following sections. A separate standalone CEMP has been prepared and is included as Appendix 2-5 to this Chapter.

2.1 EXISTING SITE AND INFRASTRUCTURE

2.1.1 Site Location

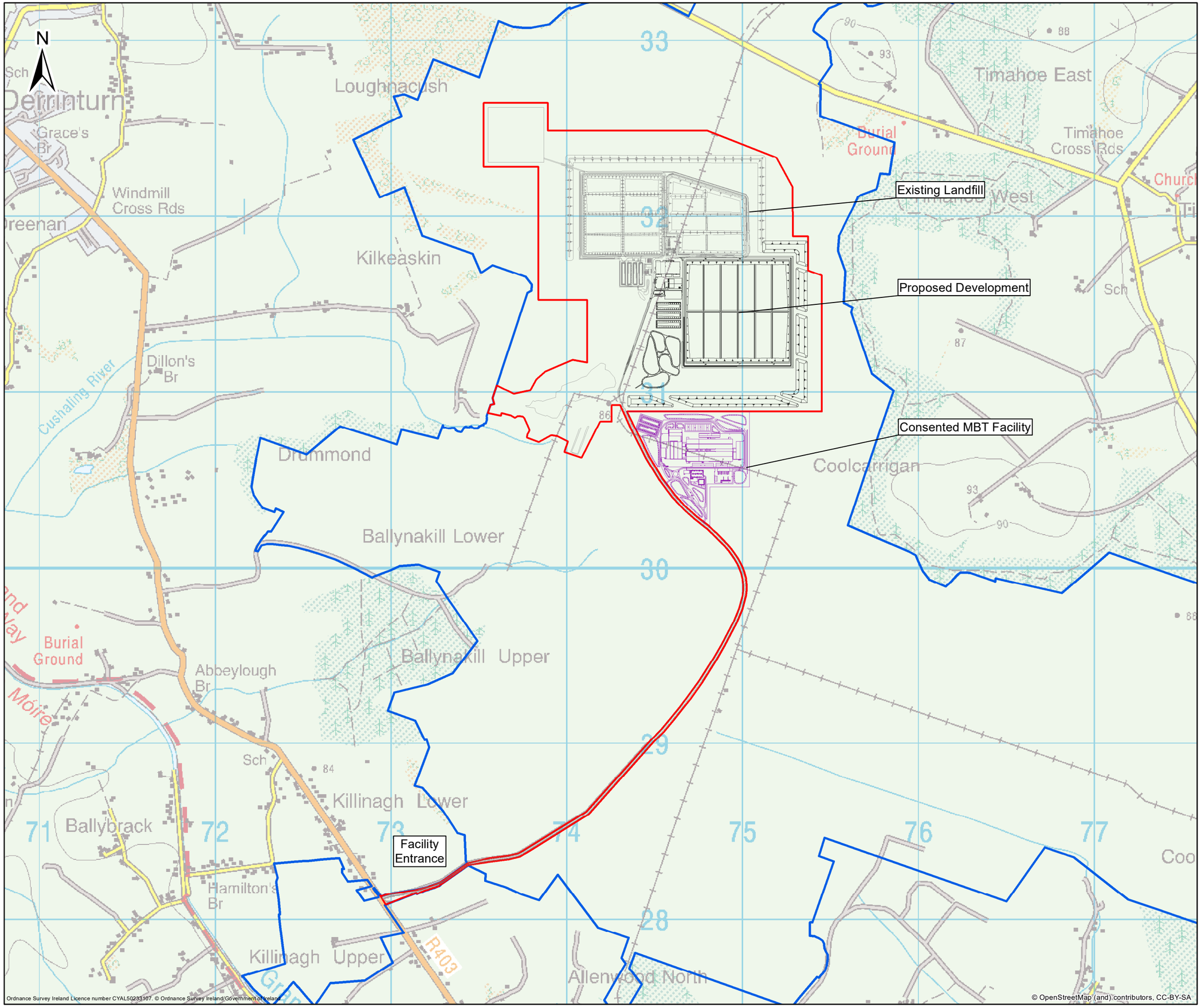
The Bord na Móna property, as outlined in blue in the Site Location Map (Figure 1-1), is located within the County Kildare townlands of Drehid, Ballynamullagh, Kilmurry, Mulgeeth, Mucklon, Timahoe East, Timahoe West, Coolcarrigan, Corduff, Coolearagh West, Allenwood North, Killinagh Upper, Killinagh Lower, Ballynakill Upper, Ballynakill Lower, Drummond, Kilkeaskin, Loughnacush, and Parsonstown. This landholding has a total area of 2,544 ha.

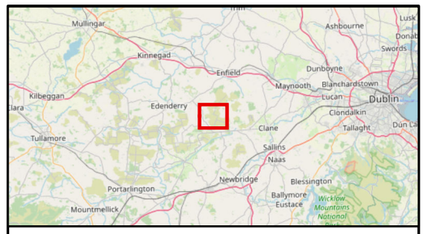
The application boundary, outlined by the red line in Figure 1-1 and which is defined as the area in which the application for development is being made and within which all activities associated with the proposed development will occur, is confined to the townlands of Timahoe West, Coolcarrigan, Killinagh Upper, Killinagh Lower, Drummond, Kilkeaskin, Loughnacush, and Parsonstown. The activities associated with the proposed development will be confined to a landbank of approx. 262 ha within the overall Bord na Móna landholding. This area incorporates both the proposed new infrastructure and the existing infrastructure, as the overall facility will have widespread overlap between new activities and existing activities.

The planning application boundary for the proposed development is approx. 2.6 km from the centre of the village of Derrinturn located to the north-west of the site and is approx. 1.7 km from Timahoe Crossroads located to the east. Figure 1-1 shows the position of the site relative to the nearby population centres of Derrinturn, Timahoe, Coill Dubh and Allenwood as well as the surrounding public road network.

The existing and operational waste management facility at Drehid (which is described in Section 2.1.5) is accessed from the R403 Regional Road via a dedicated entrance and private 4.8 km long access road. This entrance and road will also be used to access the proposed development from the public road network. The R403 runs north-west to south-east around the overall Bord na Móna landholding as shown in Figure 1-1. The R403 joins with the R402 at Carbury to the north-west of the site and joins to the R407 in Clane to the east of the site. The R402 links Edenderry and Enfield connecting to the M4 Dublin to Sligo Motorway on the outskirts of Enfield. The R407 links Naas to Kilcock and also links to both the M4 and the M7 (Dublin to Limerick Motorway). The M4 is located approximately 9 km to the north of the proposed development and the M7 is located approximately 17 km to the south-east.

The footprint of the proposed development is primarily located to the east of the existing private access road and south of the existing landfill infrastructure as shown on the Facility Master Plan in Figure 2-1 (OSI) and Figure 2-2 (aerial).





Legend

- Planning Application Boundary
- Bord na Móna Ownership Boundary

Site Layout

- Proposed Site Layout
- Existing Landfill
- Consented MBT Facility

0 250 500 750 1,000
Metres

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

Issue	Date	Description	By	Chkd.
A	25/05/2023	Final issue	S.P	R.H

Client: Bord na Móna

Project: Drehid Waste Management Facility Further Development

Title: Facility Master Plan (OSI)

Scale @ A3: 1:20,000

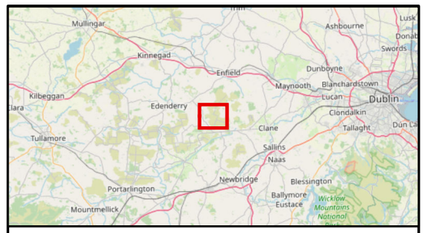
Prepared by: S.Pezzetta | Checked: R.Hunt | Date: May 2023

Project Director: D.Grehan

TOBIN CONSULTING ENGINEERS
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax:+353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

Draft: A

Figure 2-1



Legend

- Planning Application Boundary
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Issue	Date	Description	By	Chkd.
A	25/05/2023	Final issue	S.P	R.H

Client: Bord na Móna

Project: Drehid Waste Management Facility Further Development

Title: Facility Master Plan (AERIAL)

Scale @ A3: 1:20,000

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

Project Director: D.Grehan

TOBIN CONSULTING ENGINEERS
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax:+353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

Figure 2-2

Draft: A

2.1.2 Topography

A topographical survey was carried out at the site in February 2016 by TOBIN and has been verified by additional surveys of the site carried out by Bord na Móna in 2022. The output of these surveys are presented in a topographical contour map included in the planning drawings (Drawing No. 11290-2004 of Appendix 2-1).

The topography across the overall Bord na Móna landholding is relatively flat ranging from 80 m above ordnance datum (AOD) to 90 mAOD. The existing landfill at the site is well screened from nearby roads by existing hedgerows and trees and is located a considerable distance from the main road network in each direction, i.e., >750 m north to the L5025, >2.1 km east to the L1019 and >2.4 km south and east to the R403. The separation distance is enhanced by the growth of bog willow tree stands over several parts of the cutaway bogland and by dense hedge lines and commercial forestry to the east, south and west of the site.

The topography underlying the proposed development is flat and gently undulating, ranging from 82.0 mAOD to 86.5 mAOD. Existing vegetation provides significant screening from the general public and will be supplemented by additional planting as described in Section 2.2.9. The proposed new landfill infrastructure will be remote from the surrounding road network; c. 1.0 km south from the L5025, c. 1.9 km west from the L1019 and c. 3.0 km east from the R403.

2.1.3 Land Use

The proposed development will take place within a large land bank owned by Bord na Móna (2,544 ha) as outlined in blue in Figure 1-1. The overall land bank mainly comprises Timahoe Bog which is divided as Timahoe North and South Bogs by the L5025 Local Road. There are agricultural lands within the land bank to the south-west of the site entrance. Land use within and adjacent to the proposed development, and across the majority of the landholding, comprises disused cutaway bogland which was used historically for the commercial production of sod peat. Immediately adjacent to the applicant lands, there are areas where turbary, commercial forestry and agricultural uses are evident.

The existing waste management facility at Drehid (described in detail in Section 2.1.5) is located centrally in the northern portion of the Timahoe South Bog. The proposed new infrastructure (described in detail in Section 2.2) will be located adjacent to the existing infrastructure, to the south-east. This existing facility is owned and operated by Bord na Móna and provides infrastructure which will support the proposed development, including, but not limited to, the existing access road, existing composting facility, surface water drainage network and administration building.

Planning permission was granted to Bord na Móna in 2013 for a Mechanical Biological Treatment (MBT) facility (ABP Pl. Ref. PA09.PA0027) which was planned for an area immediately south of the proposed development planning application boundary and within the overall landholding as shown on Figure 1-1. The MBT facility was intended as a separate distinct waste treatment facility located adjacent to the proposed development. Bord na Móna took the decision in 2022 not to develop this MBT facility.

Planning permission was granted to Bord na Móna/ESB in July 2020 for the development of a 200 ha solar farm within the Bord na Móna landholding in Timahoe Bog North (KCC Pl. Ref. 18/1514) approximately 730 m north of the proposed development planning boundary. This project is currently (May 2023) under construction.

Bord na Móna has identified a portion of Timahoe South Bog to the south-east of the proposed development for a potential renewable energy project. No works have commenced on this project to date. The potential area for the project has been highlighted as a constraint in the rehabilitation plan for Timahoe South Bog.

Further information on current land use and the future rehabilitation of the cutaway bogland outside of the waste management facility boundary is provided in the *Timahoe South Bog – Cutaway Bog Decommissioning and Rehabilitation Plan 2022* which is provided in Appendix 2.2 of this EIAR.

2.1.4 Surrounding Population Centres

As per Section 2.1.1, the main population centres surrounding the site of the proposed development are Derrinturn, Timahoe, Coill Dubh and Allenwood. Derrinturn is located approximately 2.6 km to the north-west, Timahoe Crossroads is approximately 1.7 km to the east, Coill Dubh is approximately 5.2 km to the south-east and Allenwood is approximately 4.9 km to the south[1].

Residential development in the immediate area surrounding the site is sparse given the isolated nature of the site within the boglands. The closest residential development to the proposed new landfill footprint is c. 1.3 km to the west, 1.0 km to the north-east and 1.4 km to the east (Figure 2-3). The closest residential property to the south is more than 4 km from the proposed landfill footprint. The locations of residential and commercial properties within 1 km of the proposed development site boundary were obtained from the GeoDirectory service and are presented in Figure 5-1 as part of the assessment of potential impacts on the local population.

[1] Distances measured from the closest point on the perimeter of the proposed landfill to the estimated centre of the town/village.

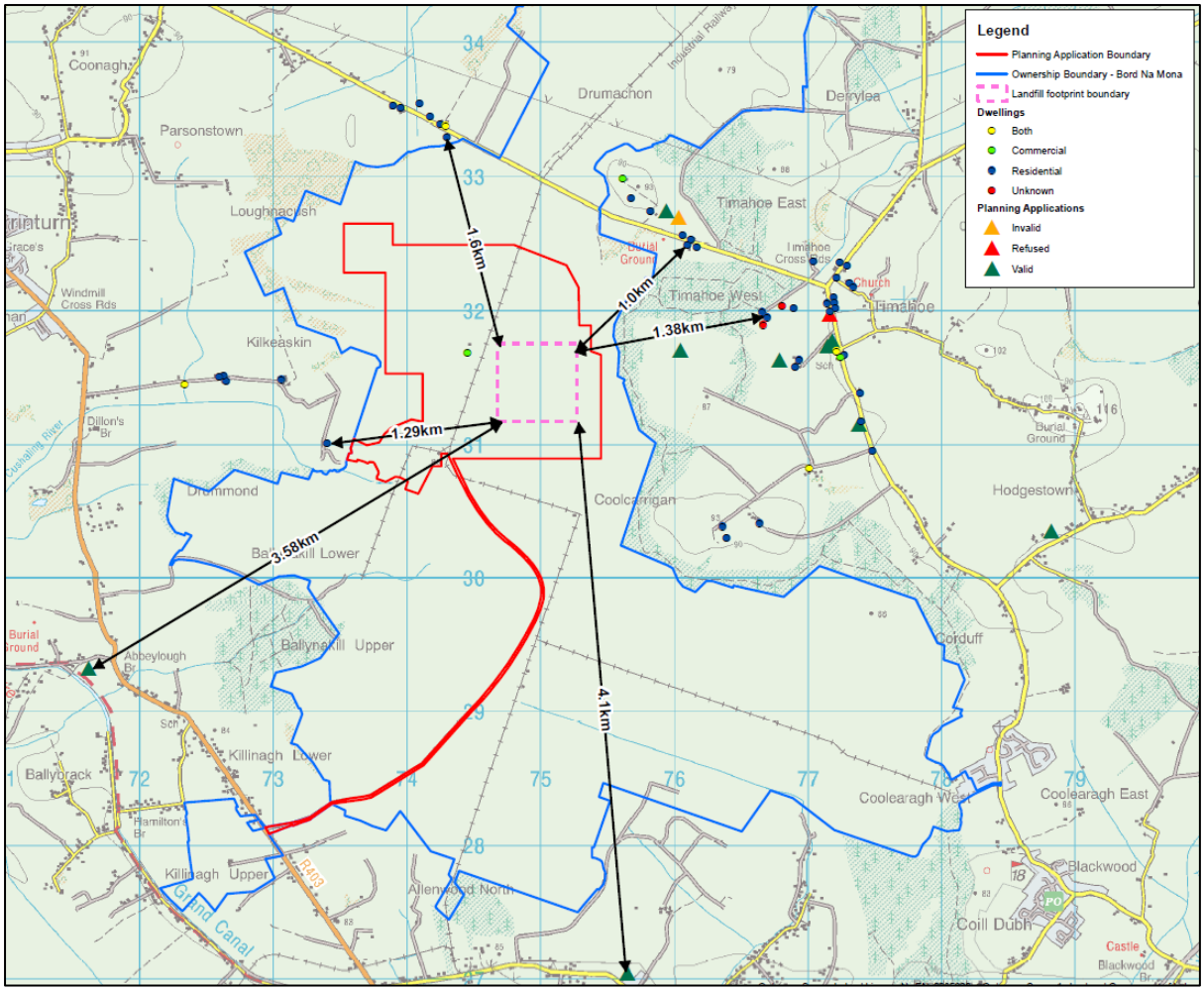


Figure 2-3 – Distance from the proposed landfill to closest residential receptors

Residential developments in the surrounding area typically comprise one-off detached buildings, many of which have adjacent farmyards or sheds. The largest concentration of residential properties is to the north-west of the site in the village of Derrinturn. In the town and village areas, residential properties also include semi-detached houses and apartments.

2.1.5 Existing Infrastructure

The proposed development, described fully in Section 2.2, primarily comprises new non-hazardous waste landfill infrastructure, a new municipal solid waste (MSW) processing and composting facility and a new soils, stones and construction and demolition (C&D) rubble processing facility. This proposed infrastructure is effectively an extension of the existing and operational integrated waste management facility at Drehid. The proposed new landfill infrastructure and additional composting capacity will utilise the existing similar infrastructure already in place and operational at the facility. In addition, the new MSW processing facility will be contained within an extension to the existing compost building to maximise infrastructure and utility efficiency.

The existing waste management infrastructure comprises a non-hazardous waste landfill and a biowaste composting facility. These are described in more detail in Section 2.1.5.1 and Section 2.1.5.2. In addition to the main waste infrastructure, the existing facility comprises a private site entrance, high-quality 4.8 km long access road from the R403, weighbridge, access control kiosk, administration building, car parking, maintenance building, domestic wastewater treatment system and surface water drainage network. This infrastructure, with the exception of the

facility entrance and most of the length of the access road, is located to the north and west of the proposed development footprint as shown in Figure 2-1 and Figure 2-2.

The existing facility includes a leachate storage and landfill gas treatment compound located adjacent to Phase 9 of the existing landfill. The compound is used to collect leachate generated from within the existing landfill waste body and temporarily store it within two dedicated leachate storage tanks prior to collection and removal off-site by road tankers. Also located in this compound is a 5-megawatt (MW) landfill gas utilisation plant (LGUP) which takes landfill gas generated within the waste body and converts it into electricity which can be used at the facility or exported to the electrical grid. This compound also includes a dedicated electrical substation.

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

- Landfilling of non-hazardous residual waste up to 120,000 TPA;
- Composting of suitable biowaste up to 25,000 TPA; and
- No limit on the acceptance of inert waste, where used in landfill engineering.

The above waste activities are authorised at the facility until 2028 under the current planning permission and IE Licence.

2.1.5.1 Existing Landfill

The main infrastructure at the Drehid WMF is the existing landfill which accepts non-hazardous waste material that has been subjected to treatment, including residual waste arising from the operation of mechanical waste treatment, biological waste treatment and energy recovery from waste facilities. The landfill commenced accepting waste in February 2008 and comprises two separate mounds sub-divided into a total of 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. On average, the landfill is 15 – 20 m deep and the maximum final height, post settlement, of the landfill upon completion will be no greater than 103.25 mAOD.

As of May 2023, waste placement has been mainly completed in Phases 1 – 12 and is ongoing in Phases 13 and 14. Construction of Phase 15 is in progress and, when completed, approval will be sought from the EPA to commence waste placement in Phase 15. As of the latest capacity survey (March 2023), c. 4,639,724 m^3 of the permitted c. 5,040,000 m^3 void space has been filled.

Capping works (covering of waste with suitable material) are ongoing at the facility and the final cap is completed on Phases 1 – 4. Final capping works are ongoing on Phases 5 – 10. A temporary cap is in place on Phases 11 – 12.

Based on the current permitted rate of waste placement, it is anticipated that the existing landfill will reach its maximum void space capacity in 2026. At this point, the existing landfill will cease accepting waste material for landfilling. Ongoing works will continue at the existing landfill post completion of waste placement for profiling of the waste body, placement of the final capping, completion of landfill gas management infrastructure and management of leachate and landfill gas.

2.1.5.2 Existing Composting Facility

The existing compost facility commenced acceptance of waste in 2011 and is permitted to accept up to 25,000 TPA of suitable organic waste. The operational lifetime of the composting

facility is currently aligned with the existing landfill and will cease operations in 2028. It is proposed as part of this current application to remove the restriction on the operational lifetime of the existing composting facility.

The compost facility comprises a two-bay steel portal framed structure with metal cladding and roller shutter doors for ease of access for machinery. The building has a floor area of c. 3,960 m^2, is 10 m in height at the eaves (93.35 m AOD) and 12 m in height at the ridge (95.35 m AOD). The building floor comprises a reinforced concrete slab with segregated areas and bays for handling of incoming waste materials through the different composting stages. The floors have drains which collect leachate run-off for recirculation back into the composting process. The building ventilation maintains a negative pressure to retain odours within the building and to route the controlled air through a biofilter.

The composting facility provides for the biological treatment of organic fines and source separated organic waste. Organic fines are generated from the pre-treatment and screening of MSW and primarily comprises organic material in the form of food and garden waste. Source separated organic waste arises from the separate collection of food waste and garden waste at municipal (household and commercial) and industrial premises. Outputs from the composting process in the form of biostabilised material (biostabilised meaning that the incoming waste has been treated to achieve an EPA-approved biodegradability stability standard) and non-compostable materials (i.e., material which is not biodegradable) are placed in the existing landfill described above.

The existing facility operates under a licence issued by the Department of Agriculture, Food and the Marine (DAFM) (Licence No. Comp 63) for the handling of Animal By-Products (ABP).

Further detail on the composting process is provided in Section 2.5.

2.1.6 Permitted Mechanical Biological Treatment (MBT) Facility

Bord na Móna was granted planning permission (ABP Pl. Ref. PL09.PA0027) in 2013 for a separate waste treatment facility, referred to as the MBT facility, located within the overall Bord na Móna landholding immediately to the south of the proposed development planning boundary. A separate IE Licence for the facility (Reg. No. W0283-01) was granted by the EPA in 2014. The planning permission and IE Licence for the MBT facility permits the acceptance of up to 250,000 TPA of MSW which would be processed through a combination of mechanical and biological treatment methods.

The MBT facility has not been developed to date and Bord na Móna has taken the decision in 2022 not to develop this facility. Planning permission for the MBT facility will expire in 2023.

For clarity, in this document Drehid WMF refers to the existing landfill, compost plant and associated infrastructure as well as the proposed development footprint which is the subject of this planning application. Any reference to the Drehid MBT facility refers to the separate waste treatment facility which was planned within the same Bord na Móna landholding but as per previous paragraph, will not be developed. The permitted location of the Drehid MBT in relation to the Drehid WMF is shown in Figure 2-1.

2.2 DETAIL OF THE PROPOSED DEVELOPMENT

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

- Increase in acceptance of non-hazardous household, commercial & industrial and C&D waste at the existing landfill from the currently permitted disposal quantity of 120,000 TPA to 250,000 TPA until the permitted void space in the existing landfill is filled and no later than the currently permitted end date of 2028;
- Development of extended landfill footprint of approximately 35.75 ha to accommodate the landfilling of 250,000 TPA of non-hazardous household, commercial & industrial and C&D waste for a period of 25 years to commence once the existing landfill void space is filled. The new landfill will have a maximum height of approximately 32 m above ground level (115.75 mAOD);
- Provision, as part of the extended landfill infrastructure, for 30,000 TPA of contingency disposal capacity for non-hazardous waste, to be activated by the Planning Authority only as an emergency measure, for a period of 25 years;
- Development of a new Processing Facility, for the recovery of 70,000 TPA of inert soil & stones and C&D waste (rubble) and use of same for engineering and construction purposes within the site, including as engineering material in the landfill;
- Increase in acceptance of waste at the existing Composting Facility from 25,000 TPA to 35,000 TPA and removal of the restriction on the operating life of the Composting Facility contained in Condition 2(2) of ABP Ref. No. PL.09.212059;
- Extension to, and reconfiguration of, the existing Composting Facility to provide for a new MSW Processing and Composting Facility with an additional capacity of 55,000 TPA (giving a combined total for the MSW Processing and Composting Facility of 90,000 TPA), allowing for the combined facility to accept both MSW and other organic wastes;
- Construction of a new odour abatement system at the existing Composting Facility including two emissions stacks to a height of 17 m above ground level;
- Construction of a new odour abatement system as part of the new MSW Processing and Composting Facility including two emissions stacks to a height of 17 m above ground level;
- Development of a new Maintenance Building with staff welfare facility, office, storage and a laboratory;
- Installation of a new bunded fuel storage area to the rear of the new Processing Facility for the recovery of soil & stones and C&D waste (rubble);
- Construction of two new permanent surface water lagoons and one new construction stage surface water lagoon;
- Construction of a new integrated constructed wetland (ICW) area comprising five ponds;
- Car-parking provision for operational staff;
- Landscaping and screening berms; and
- All associated infrastructure and utility works necessary to facilitate the proposed development and the restoration of the facility following the cessation of waste acceptance.

The total waste intake of 440,000 TPA described above includes 30,000 TPA contingency capacity provided following pre-application consultation with the Regional Waste Officers at the Regional Waste Management Planning Office (RWMPO). This contingency capacity will not be utilised by the Applicant under normal operations and will only be activated in strict circumstances by Kildare County Council (KCC) in consultation with the RWMPOs and the EPA. Further detail on this contingency allowance is set out in Section 2.2.1.1.

Table 2-1 provides a summary of the total waste volumes proposed for acceptance at the Drehid WMF, as described above. It is noted that the quantities set out in Table 2-1 are for the entire Drehid WMF, incorporating the existing permitted infrastructure. No additional waste, above the quantities set out in Table 2-1, will be taken in at the Drehid WMF.

Table 2-1 – Proposed waste quantities for acceptance at the Drehid WMF

Facility Infrastructure	Waste Type/Source	Maximum Incoming (TPA)	Of Which		Life of Facility
			Disposal to Landfill (TPA)	Recycling, Recovery or Process Losses (TPA)	
Extension to existing Landfill with intake increased from 120,000 TPA to 250,000 TPA	Non-hazardous household, commercial & industrial and C&D wastes	320,000	250,000	-	25 Years
New Processing & Recovery Facility (70,000 TPA)	Inert soil & stones and C&D Waste (Rubble)		-	70,000 Recovery – remains onsite for use as Engineering & Construction Material	25 Years
Existing Composting Facility increased from 25,000 to 35,000 TPA	Non-hazardous MSW and Other Organic Waste	90,000	40,000 Rejects and Biostabilised Compost Like Output	30,000 Process Losses	Unrestricted
New MSW Processing & Composting Facility (55,000 TPA) as an extension to existing Composting Facility				20,000 Recyclables and RDF/SRF[1] - Outgoing	
Contingency Capacity (30,000 TPA) – Landfill Disposal as requested by RWMPO	Non-hazardous household, commercial & industrial and C&D wastes	30,000	30,000		25 Years
Total		**440,000**	**320,000**	**120,000**	

[1] RDF = Refuse Derived Fuel; SRF = Solid Recovered Fuel

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

The proposed development works primarily comprise a continuation of the current operations at the existing facility with changes in the quantity and duration of waste acceptance as per Table 2-1 and detailed in the following sections.

The proposed new MSW processing infrastructure will allow for the acceptance of untreated MSW which will be screened to remove recyclable materials and undersize material (typically <60 mm diameter). The remaining material will comprise a refuse derived fuel (RDF) or feed material to produce solid recovered fuel (SRF) product which will then be exported from the Drehid WMF along with the recycled materials for further processing off-site. The undersize material (typically referred to as organic fines) will be subject to biological treatment in composting tunnels at the facility with the biostabilised output being disposed of to landfill.

The proposed new processing building for the screening and segregation of non-hazardous soils, stones and C&D rubble will allow for the recovery of suitable materials for use as recycled engineering materials. These incoming waste types will be directed to the new building and offloaded for processing within a covered area. The screened and sorted materials will be reclassified as non-waste materials subject to compliance with End-of-Waste criteria (explained in Section 2.2.6.1) and can be utilised at the facility for road construction, landfill working face tipping platforms and landfill capping. The use of recycled material in this way will reduce the quantities of virgin aggregates and greenfield inert soils which are required to be imported to the site for these engineering purposes.

2.2.1 Additional Landfill Capacity

It is proposed to provide additional capacity for the landfilling of up to 290,000 TPA of non-hazardous wastes for disposal as outlined in Table 2-2. This further capacity will be provided by way of new landfill infrastructure at the location as shown in Figures 2-1 and 2-2.

Table 2-2 – Nature and quantity of waste for disposal at new landfill

Waste Type	Waste Quantity (TPA)	Duration of Waste Acceptance
Non-hazardous household, commercial & industrial and C&D wastes, comprising: • Non-hazardous soils and stones, C&D rubble and C&D fines • Residual municipal solid waste (rMSW), including biostabilised waste generated from off-site sources • Commercial and industrial wastes • Incinerator bottom ash (IBA)	250,000	25 years
Biostabilised waste and reject waste (generated within Drehid WMF boundary from MSW processing and composting activities)[1]	40,000	25 years
Total	**290,000**	

[1] *This quantity accounts for the total biostabilised waste and rejects output from; the existing compost facility, the increase in existing compost facility throughput and the new MSW processing and composting facility infrastructure.*

In addition to the quantities set out in Table 2-2 above, engineering materials are required during operations for the development of access ramps/roads, turning areas, tipping platforms, daily cover, intermediate/temporary/final cover and for installation around landfill gas collection wells. From current experience at the facility, it is estimated that approximately 70,000 TPA of engineering materials will be required for this purpose, of which approximately 50,000 TPA will be required within the engineered liner. The remaining c. 20,000 TPA will be required outside the engineered liner for final capping purposes.

The proposed development includes for the acceptance of up to 70,000 TPA of engineering materials, comprising inert soil & stones and C&D rubble for this purpose. A new processing

facility will be developed (refer to Section 2.2.6.1) for screening and sorting of incoming materials which can be used for engineering purposes to ensure their suitability. Waste materials used for engineering purposes in the landfill will replace the need to import virgin aggregate or greenfield soils for the specific purpose. This is, therefore, classified as waste recovery, rather than waste disposal when used in this way.

Permission is sought for the landfilling of the above waste materials for a period of 25 years. Based on a blended density of the above waste types of c. 1.19 tonnes/m^3, it is envisaged that there will be a requirement for c. 285,000 m^3 (290,000 tonnes + 50,000 tonnes engineering materials = 340,000 tonnes @ 1.19 tonnes/m^3), excluding contingency capacity, of landfilling capacity for each of the 25 years. This equates to c. 7,150,000 m^3 (c. 8,500,000 tonnes) over the 25-year operational lifetime of the landfill.

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

As noted in Tables 2-1 and 2-2, up to 40,000 TPA of waste materials deposited in the new landfill will come from biostabilised and reject waste which is generated as output from the processing of MSW and the treatment of biowaste in the MSW Processing and Composting Facility. This 40,000 TPA waste output will be transferred directly to the landfill and, therefore, is not required to be counted towards the waste acceptance limits for the Drehid WMF as this material will already be accounted for in the MSW Processing and Compost Facility waste intake (refer to Section 2.2.2 and 2.2.3). Accounting for this output as part of the new landfill waste acceptance limit, would result in double counting of the material.

The biostabilised and reject waste outputs from the MSW Processing and Composting Facility will not generate any additional waste related traffic movements on the public road and placement of the waste in the new landfill will avoid the need to remove these materials from the overall landholding, thereby avoiding associated outgoing waste traffic movements and associated carbon emissions.

For the purpose of the traffic impact assessment (Chapter 14 of this EIAR), the maximum quantity of waste incoming to the new landfill will be 320,000 TPA (250,000 TPA waste for disposal + 70,000 TPA engineering materials for recovery). Including for the intake of 90,000 TPA of waste to the MSW Processing and Composting Facility, the overall maximum waste intake using the public road network is 410,000 TPA. Where the contingency capacity is activated by KCC in any given year, this maximum intake will increase to 440,000 TPA (as per Table 2-1 above).

Figure 2-4 is provided to illustrate the movement of waste materials into the Drehid WMF, and to the existing and proposed waste treatment infrastructure. This flow diagram also illustrates the removal of RDF / SRF material from the MSW Processing and Composting Facility (c. 20,000 TPA) and the removal of leachate from the facility (the quantity of which will vary over time) which is discussed further in Section 2.2.5.

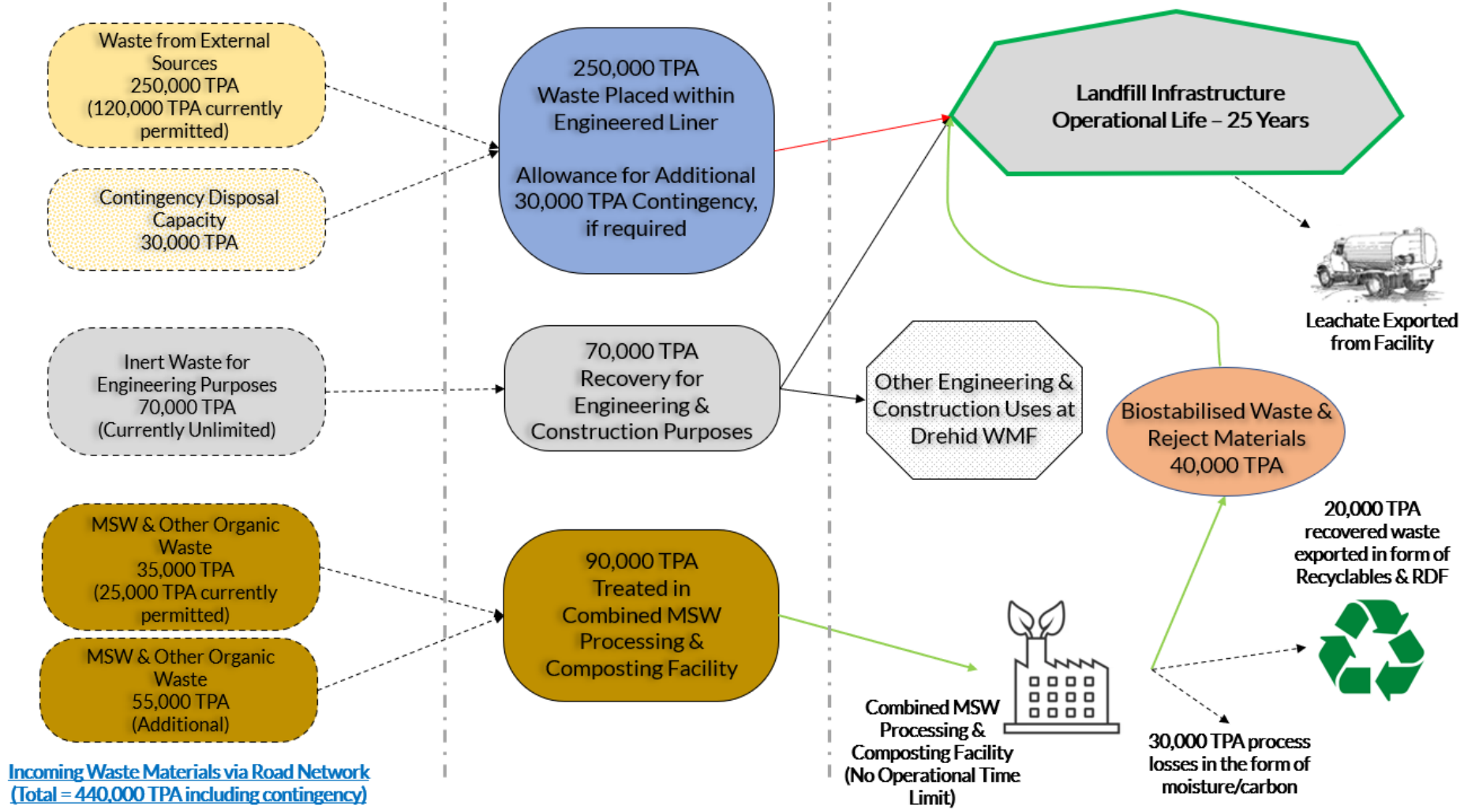


Figure 2-4 – Flow diagram of waste material movements at the proposed development

The proposed new landfill will have a maximum footprint of 35.75 ha. The maximum elevation of the landfill mound will be 115.75 mAOD at the peak of the landfill capping as shown on Drawing No. 11290-2070 of Appendix 2-1. The capping will be graded down in all directions from this peak height at a rate of 1:30 to join with the side slopes which will be constructed at a maximum grade of 1:3. Sections through the proposed landfill are shown in Drawing No.'s 11290-2031 and 11290-2032 of Appendix 2-1. Further detail on the engineering design of the landfill is provided in Section 2.3.

The landfill will be divided into 12 no. phases of approximate equal volume. Based on an operational lifetime of 25 years, each phase will cater for approximately 2.1 years of waste placement. The development of each phase will typically be as follows:

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

Leachate will also be generated in the landfill body from rain which falls on the waste material. The leachate will be collected at the base of the landfill and pumped to raw leachate storage tanks located adjacent to the existing landfill gas management compound. Leachate will be collected from the site in road tankers and transferred off-site to suitably licensed/permitted facilities as described in Section 2.2.5. Details on the leachate collection infrastructure within the landfill are provided in Section 2.3.3. There are 2 no. existing 200 m^3 raw leachate storage tanks located adjacent to the landfill gas management compound, and it is proposed as part of this development to provide for 1 no. additional 200 m^3 raw leachate storage tank at the location as shown on Drawing No. 11290-2010 of Appendix 2-1.

Landfill gas will be generated from the biodegradation of waste and a landfill gas collection system will be installed to safely collect and divert this gas from the new landfill to the existing landfill gas management compound which includes landfill gas flares and LGUP which generates electricity. Details on the landfill gas collection infrastructure are provided in Section 2.3.4.

2.2.1.1 Landfill Disposal Contingency

Bord na Móna and their consultants held pre-application consultation discussions with the Regional Waste Co-ordinators from the three RWMPO's (Eastern-Midlands Region, Southern Region and Connacht-Ulster Region) on two separate occasions in October 2022. As part of this consultation and in reference to the submission made by the RWMPO's on the previous application for development at the Drehid WMF submitted in December 2017, it was advised that the authority would be seeking that a contingency capacity is built into the planning permission for the proposed development. This contingency is sought for capacity to landfill suitable non-hazardous waste in the event that there is a shortfall in the available treatment/disposal outlets in any given year.

The Regional Waste Co-ordinators outlined that they would be seeking to have 10% of the landfill disposal capacity held as contingency in any given year. This equates to 30,000 tonnes of non-hazardous waste, based on the capacity set out in Table 2-2 (rounded up from 29,000 TPA for ease of reference). The mechanism to activate the use of this contingency capacity will be subject to a defined protocol which will be established between the Applicant and the RWMPO's with input from other relevant stakeholders such as KCC and the EPA. The use of this additional 30,000 TPA of disposal capacity will only be permitted when activated by KCC under the terms of the protocol and in the interests of preventing a risk to the environment from

the absence of waste treatment infrastructure. It is noted that a similar contingency arrangement for non-hazardous waste was conditioned on the grant of planning permission for the Knockharley Landfill facility in April 2021 (Condition No. 4, ABP Ref. PA17/303211).

The design of the landfill infrastructure and available void space has accounted for this contingency amount, acknowledging that the contingency allowance may not be activated at all where there is no requirement to do so, that it may only be activated in select years over the 25-year lifetime of the facility or that not all the contingency capacity may be activated in any given year. The Applicant is committed to ensuring that there is available built capacity for the full contingency volume of 30,000 tonnes in the event that it is required at short notice. The existing facility is operated with a comfortable future built capacity already and this provision will be maintained to ensure that the contingency volume can be accommodated if required. The operational staff at the existing landfill have significant experience in the phasing and development of landfill infrastructure to meet the current and future requirements of the industry.

2.2.2 Increased Composting Facility Intake

The proposed development includes increasing the quantity of biowaste accepted at the existing Composting Facility from the currently permitted 25,000 TPA up to 35,000 TPA (an increase of 10,000 TPA). This increase can be catered for within the existing composting building without the need for any building footprint increase. The additional 10,000 TPA throughput can be facilitated by optimising the existing operations and intensifying use of the existing infrastructure within the building. These operational changes will still remain within the procedures and limits for handling ABP required by the DAFM and will remain in compliance with the composting licence granted by DAFM. The proposed changes have been discussed with the DAFM Inspector and the DAFM have been consulted with as part of the preparation of this EIAR (refer to Section 1.7 of this EIAR). The existing Composting Facility is described in Section 2.1.5.2.

This proposal also includes the removal of the operational lifetime restriction on the Composting Facility which is currently aligned to the operational lifetime of the existing landfill, i.e., 2028. This restriction was put in force by Condition 2(2) of An Bord Pleanála Decision Ref. PL.09.212059.

Waste accepted at the existing Composting Facility comprises organic fines and source separated organic waste from municipal, commercial and industrial sources. The same waste types will continue to be accepted at the facility under this current proposal. Further details on the composition of waste to be accepted at the Composting Facility are provided in Section 2.2.4.

As per the current operations, the incoming organic waste is composted within the building to provide a biostabilised waste output. The quantity of waste output is typically 65-70% of the waste input with the balance of material lost as carbon breakdown and moisture. Biostabilised waste outputs are currently placed in the existing landfill and will be placed in the new landfill once constructed.

A new odour abatement system in the form of an enclosed biofilter will be constructed on the southern façade of the existing composting building to treat the controlled air from within the composting facility. The existing odour abatement system, which is located within the existing building, will be decommissioned on commencement of operation of the new system. The odour abatement equipment will be located within a steel framed 'lean-to' extension which will be enclosed with metal cladding to match the existing compost facility appearance. This extension

will have a footprint of 32 m x 17 m with a roof rising from 6 m above ground level at the eaves (89.35 m AOD) to 9 m at the ridge (92.35 m AOD). Two new vertical chimney stacks will be installed to provide for dispersion of the treated air from within the building. These stacks will be installed to a height of 17 m above ground level (100.35 m AOD) and will have an internal diameter of 1.1 m. The layout of the proposed extension housing the new odour abatement system is shown on Drawing No.'s 11290-2081, 2082 and 2083 of Appendix 2-1.

Further details of the composting process and the emission control measures are provided in Section 2.5.

As part of the processing of MSW as described in Section 2.2.3, an area within the existing composting facility will be utilised for the sorting, baling and loading of recyclables and recovered RDF / SRF as shown on Drawing No. 11290-2081 of Appendix 2-1. Segregated materials will be prepared in this area for loading into bulk haulage vehicles and removal from site to other waste facilities for further processing or energy recovery. Haulage vehicles will be able to enter the building through an existing roller shutter door which can be closed while the trailer is being loaded.

2.2.3 New MSW Processing and Composting Facility

It is proposed to develop a new MSW Processing and Composting Facility at the site to cater for the acceptance of MSW material which has not been subject to any pre-treatment previously. This facility will be constructed as an extension to the existing Composting Facility and will utilise existing road access and utility infrastructure at this location. The new extension will have a processing capacity of 55,000 TPA giving the overall building a combined capacity of 90,000 TPA.

The new extension will have a footprint of 82.5 m x 101.5 m and will extend to the east of the existing composting building. The building will comprise a three bay steel structure with reinforced concrete walls and metal cladding and will have an identical appearance to the existing building. The new building will extend from 10 m in height at the building eaves (93.35 m AOD) to 12 m at the ridge (95.35 m AOD) as per the existing building. An internal access will be made from the new building into the old building to facilitate the movement of wastes within a controlled environment and to minimise the requirement for opening roller shutter doors for vehicle access. The building ventilation will be controlled using extract fans to maintain negative pressure within the building. The layout of this building is shown on Drawing No. 11290-2081 of Appendix 2-1.

MSW will be delivered to the new facility in a combination of refuse collection vehicles (RCVs) and bulk trailers and will be offloaded in the reception hall. The incoming waste will be subject to a bag opening process in the reception hall and then placed in concrete tunnels within the building for approximately 12 days for drying. There will be six tunnels which will have an internal area of 29.5 m x 9.7 m each. The waste will then be unloaded from the tunnels and subjected to screening and sorting to segregate recyclable materials, RDF / SRF feed materials and an undersize (<60 mm) fraction. As per Section 2.2.2 and Drawing no. 11290-2081 of Appendix 2-1, this sorting of recyclables and RDF / SRF will be carried out in a reconfigured area within the existing building. Recyclables and RDF / SRF material will be removed from the site in bulk trailers for further processing off-site. The undersize fraction, which is typically referred to as organic fines, will be subject to further biological treatment in dedicated composting tunnels. 13 no. new composting tunnels will be provided for in the building extension in addition to the 12 no. composting tunnels currently in place in the existing building. The new composting tunnels will have an internal area of 27 m x 5.5 m each. The composting of the organic fines in the new building will be identical to the activities currently carried out in the existing building.

Once constructed, the overall building will operate as a combined MSW Processing and Composting Facility with capacity for 90,000 TPA of suitable wastes. Details of the waste processing activities to the carried out in this facility are provided in Sections 2.5 and 2.6.

The new building will also have an odour abatement system constructed in a 'lean-to' structure on the southern façade of the building. This structure will have a footprint of 40 m x 17 m to accommodate two enclosed biofilters and will otherwise be identical to the new biofilter to be constructed at the existing building as described in Section 2.2.2. Two new stacks will be installed to provide for dispersion of the treated air from withing the building. These stacks will be installed to a height of 17 m above ground level (100.35 m AOD) and will have an internal diameter of 1.1 m. Further details on the odour abatement system are provided in Section 2.5.

A new Technical Room will also be constructed on the southern façade of the new building as shown on Drawing No. 11290-2081, 2082 and 2083 of Appendix 2-1. This area will have a footprint of 34.5 m x 14.6 m with a 'lean-to' roof rising from 6.3 m at the eaves (89.65 m AOD) to 7.65 m at the ridge (91.0 m AOD). The building will comprise a steel frame with metal cladding to match the adjacent existing and proposed buildings. The Technical Room will house a fan and scrubber area, pump room, control room, electrical room and welfare facilities.

2.2.4 Waste Composition

The types of waste that will be accepted at the proposed development are described in the following sections.

2.2.4.1 New Landfill

Waste materials accepted and placed in the new landfill will be similar in nature to the waste materials currently accepted and placed in the existing landfill. The new landfill will effectively be an extension of the existing landfill infrastructure which is expected to reach its void capacity in 2026. The following is a list of the non-hazardous waste types that will be accepted for landfilling at the facility along with the estimated quantities of each waste type:

- C&D fines and C&D rubble – c. 109,000 TPA
- Non-hazardous soils and stones – c. 50,000 TPA
- Municipal solid waste (residual fraction) (rMSW) (including biostabilised waste) – c. 85,000 TPA
- Other non-MSW – 1,000 TPA
- Incinerator bottom ash (IBA) – c. 5,000 TPA
- Biostabilised waste (generated at Drehid WMF) – c. 40,000 TPA
- Recovered inert waste for engineering purposes – c. 50,000 TPA

These materials are all currently landfilled at the facility in accordance with the existing IE Licence and this proposal is for a continuation to accept the same types of materials at the new landfill. The estimated breakdown of waste types set out in the list above is based on the current market conditions but will fluctuate according to evolving waste policy, waste pre-processing activities, the types of materials placed on the market which become waste and waste generation rates. The above quantities are not maximum limits for each waste type, rather an estimated breakdown of waste types for the purpose of this EIAR and the facility design. These waste quantities will fluctuate over the 25-year lifetime of the facility.

Most notably, it is anticipated that rMSW quantities will reduce in future years where circular economy policy encourages reusability in product designs and less non-recyclable waste types are being generated. In addition, the Landfill Directive (1999/31/EC) requires that no more than 10% of MSW nationally is sent to landfill by 2035. This target will drive the need for alternative

MSW treatment options and will reduce the quantity of rMSW in the market which requires disposal to landfill. At the same time, available landfill capacity for disposal of rMSW will be subject to variation. There are currently only three landfills in Ireland accepting rMSW for disposal.

rMSW intake at the Drehid WMF will be limited to a maximum of 120,000 TPA to ensure that alternative options for treatment of rMSW are being utilised. From pre-application discussions with the RWMPO's, this upper limit is considered appropriate to ensure there is available capacity while also ensuring that preferred treatment options are encouraged.

The national roll-out of brown bins for biodegradable waste is also expected to increase the quantity of biostabilised waste which is generated in the market, and which will require landfilling. The Government's *Waste Action Plan for a Circular Economy* (2020) states that *"The EPA has estimated that correct use of the three household bins could reduce the volume of the general waste bin* [MSW] *by a third, and that municipal recycling (including organic waste for composting and anaerobic digestion through the organic bin) rate could increase by 50% (from 40%)".* These measures, once implemented, may take a number of years to take effect and will result in slight changes in the above breakdown. Section 4.2 in Chapter 4 presents projections in future waste generation rates based on data from the EPA and the RWMPO's as well as European-wide changes in waste generation and management trends. These projected trends in the waste market will influence the exact make-up of individual waste types being placed into the new landfill over its 25-year operational lifetime.

Further information on the individual waste types is provided as follows.

C&D fines and C&D rubble:

This waste is generated from C&D activity, including site development, new construction, refurbishment and demolition.

Fines material refers to the small-sized fraction of waste that is mechanically separated from a mixed-sized waste stream by passing it through a screen (such as a trommel) during a waste processing activity. C&D fines are generated from the mechanical pre-treatment and screening of C&D waste. The fines material is usually segregated from the incoming mixed C&D waste stream after an initial shredding, agitation or crushing pre-step.

C&D rubble refers to inert C&D waste materials made up from individual streams or combined streams of concrete, bricks, tiles and ceramics. These materials are man-made and are usually generated from excess materials in new construction activity or from demolition of existing infrastructure. Only C&D rubble which does not include any hazardous substances will be accepted at the facility.

These C&D waste types predominantly come to the existing facility from the Greater Dublin Area (GDA)[2] and are a function of the significant construction activity in this area, particularly site preparation and demolition works. C&D fines are pre-treated in a suitable licensed/permitted facility before being brought to the Drehid WMF. There are a number of these authorised facilities located in the GDA. C&D rubble may be transferred directly to the

[2] The Greater Dublin Area (GDA) includes the geographical area of Dublin City, Dun Laoghaire-Rathdown, Fingal, South Dublin, Kildare, Meath, and Wicklow and incorporates the regions of both the Dublin Regional Authority and the Mid-East Regional Authority. (*Regional Planning Guidelines for the Greater Dublin Area 2010-2022* (2010))

Drehid WMF where it is segregated at source, or it may be received from C&D waste transfer stations.

Non-hazardous soils and stones:

Excavated soil and stone material is generated mostly from construction activity. Where this material is generated from greenfield (undeveloped) sites, it is typically referred to as being inert and can generally be accepted at soil recovery facilities which do not have engineered basal liner or capping liner systems.

Excavated soil and stone material which is not from greenfield sites and is not classified as hazardous, can only be accepted for disposal in engineered landfill sites in accordance with specified Waste Acceptance Criteria (WAC) set out in the *EC Council Decision 2003/33/EC*. The proposed facility in Drehid will accept non-hazardous soil and stone material for disposal to landfill meeting the criteria for non-hazardous waste as set out in the EC Council Decision referred above.

Similar to C&D fines and rubble, the majority of non-hazardous soil and stones accepted to the Drehid facility will be from the GDA and is a function of the significant construction activity underway in this area.

rMSW:

Municipal solid waste (MSW) refers to household waste as well as commercial and industrial waste which is similar in nature to household waste, typically termed 'black bin' waste. MSW accepted for placement in the new landfill will be required to have undergone various degrees of pre-treatment prior to acceptance at the facility and, having undergone this pre-treatment, is referred to as residual MSW (rMSW). Pre-treatment activities, such as those carried out at mechanical sorting facilities and MBT facilities, will remove recyclable and organic materials from the MSW stream with the remaining residual materials having no other treatment route other than recovery, typically in the form of energy recovery from thermal treatment, or disposal, typically to an engineered lined landfill. rMSW also includes non-reusable and non-recyclable 'bulky waste' items which do not fit in standard 'black bin' wheelie bins and may be collected separately from household, commercial or industrial customers.

It should be noted that MSW accepted for landfilling at the facility will have undergone pre-treatment prior to acceptance and will be made up of the residual fraction of MSW for which there are no other available outlets other than disposal to landfill. This may be because of the nature of the waste meaning its unsuitable for energy recovery or due to a lack of thermal treatment capacity at a given time.

MSW accepted to the new MSW Processing and Composting Facility will be separate from the rMSW accepted for landfilling. The MSW incoming for processing will not have been subject to pre-treatment and will be treated at the facility as described in Section 2.2.3 and Section 2.6. The Waste Acceptance Procedure described in Section 2.2.7.7 will identify the nature of incoming MSW and ensure waste is directed to the correct location within the facility.

Other waste similar to rMSW which may be accepted at the new landfill, will include non-hazardous waste from unauthorised/illegal landfill remediation and non-hazardous repatriated waste. The issue of unauthorised/illegal landfill remediation and waste repatriation is discussed in more detail in Chapter 4.

MSW collected nationwide is required to undergo some form of pre-treatment to remove recyclable material and organic material with the remaining residual waste currently sent for thermal treatment in the two Waste-to-Energy facilities operating in the State, co-firing in cement kilns (three such facilities approved to accept waste in Ireland), disposal to an engineered landfill or exported from the country. The two thermal waste treatment facilities (Duleek, Co. Meath and Poolbeg, Co. Dublin) and the three approved cement kilns are often operating at their maximum permitted waste intake capacity, and there is a need for engineered landfill disposal capacity for the remaining rMSW, to reduce the quantity of waste material which is generated within the State being exported abroad for treatment. There is reducing capacity for disposal of rMSW within the country as numerous landfills have closed, and the remaining operational landfills are reaching their maximum permitted capacity. As a result, rMSW incoming to the proposed development at Drehid will be from throughout the country. Further discussion on the need for landfill disposal capacity is included in Chapter 4.

Any customers seeking to send waste materials to the Drehid WMF are pre-approved and contracts are in place to ensure the composition and quality of incoming material is known. This allows the Applicant to monitor and control the customers served and quantities of material being received at the facility. This approval and tracking process will continue under the proposed development to ensure that only approved suppliers and authorised waste types are accepted at the facility. As part of the Traffic and Transport Assessment for the proposed development, a comprehensive review of the previous five years weighbridge data has been undertaken to summarise the distribution of waste incoming to the facility. This analysis highlights the key customer locations for MSW and is a good indicator of the main future sources of MSW incoming to the proposed development. This is discussed in more detail in Chapter 14.

Other Non-MSW Waste:

On occasion, there are other non-MSW waste types which are accepted at the Drehid WMF. These other waste types are non-hazardous and are typically accepted in small quantities. Examples of these waste types which have been received in the past include:

- Waste from stone cutting (Waste Code 01 04 13)
- Waste insultation material (Waste Code 17 06 04)
- Sludges from physical/chemical treatment of waste (Waste Code 19 02 06)
- Waste from shredding metal (Waste Code 19 10 06)

Similar wastes will continue to be accepted at the Drehid WMF and are anticipated to be accepted in relatively small quantities. These wastes may originate from across the country.

Incinerator Bottom Ash:

Incinerator bottom ash (IBA) is the non-hazardous non-combustible material left over from the incineration of MSW. This material is collected at the end of the grate in thermal treatment facilities. IBA is a granular material that consists of a mix of inert materials such as sand, stone, glass, porcelain, metals, and ash from burnt materials. Ferrous and non-ferrous metals contained within the IBA will be removed from the material prior to transfer to the Drehid WMF. No separation of metals from IBA will be carried out on-site. Similarly, there will be no IBA maturation capacity at the Drehid WMF. All metals recovery and maturation will be carried out at the thermal treatment facility, or other suitably licensed facility, prior to acceptance of the waste at Drehid.

There are currently only two thermal waste treatment facilities in Ireland, namely Dublin Waste-to-Energy located at Poolbeg in Dublin and Indaver Waste-to-Energy located in Duleek, Co. Meath. Both of these facilities are permitted to accept MSW for thermal treatment and both

produce IBA waste as well as flue gas treatment residue (FGTR) and fly ash. FGTR and fly ash are hazardous waste residues resulting from the treatment of gases in thermal treatment facilities. FGTR and fly ash, or any other hazardous wastes, will not be accepted at the Drehid WMF.

IBA is classified as a non-hazardous waste material and thermal treatment facilities are required to sample and test the IBA on a frequent basis to confirm the non-hazardous nature of the waste. Dublin Waste-to-Energy commissioned a report by WRC in 2019[3] to classify the IBA from its facility in accordance with European legislation and the guidance provided by the EPA. The hazardous properties assessment presented in the report stated that *"On the basis of the testing reported, the DWtE IBA could be classified as non-hazardous. Therefore, according to the List of Waste, the IBA can be coded as non-hazardous (19 01 12 "bottom ash and slag other than those mentioned in 19 01 11")*. As part of their IE Licence (W0232-01) – Schedule C.4.1, the Dublin Waste-to-Energy facility is required to monitor and classify each consignment of IBA material from the facility. Similarly, the Indaver Waste-to-Energy facility is required under Schedule C.4 of their IED Licence (W0167-03) to carry out, at least, quarterly testing of the IBA material to confirm its classification as non-hazardous.

Bord na Móna will only accept waste at the facility from known approved sources and, as such, there is certainty that the IBA material accepted at the facility has been tested and confirmed as non-hazardous prior to arrival at the facility. At the time of submission of this planning application, there are a number of known sources of IBA which would be accepted at the new facility including most significantly Dublin Waste-to-Energy and Indaver Waste-to-Energy, both of which are in the GDA.

It is noted that the State's third thermal waste treatment facility is proposed in Ringaskiddy, Cork which will also generate non-hazardous IBA waste and may, in future, be accepted at the Drehid WMF. This new thermal treatment facility had previously received planning permission from An Bord Pleanála in 2018 but was remitted back to the planning board for further consideration by the High Court in October 2021. A decision on this planning application is still awaited at the time of writing (May 2023).

<u>Biostabilised Waste:</u>

Biostabilised waste refers to bio-waste/organic waste which has gone through a biological waste treatment process to reduce the organic content of the material. To be classified as biostabilised, the material is required to achieve an EPA-approved biodegradability stability standard. As set out in the EPA's *Guidance Note on Daily and Intermediate Cover at Landfills* (2014), stabilisation means the reduction of the decomposition properties of the waste to such an extent that offensive odours are minimised and that the respiration activity after four days (AT_4) is <7 mg O_2/g DM. Waste that has been stabilised to this standard is assigned a biodegradable municipal waste (BMW) factor of zero.

Biostabilised waste accepted at the new landfill will primarily come from the treated waste outputs from the composting process in the MSW Processing and Composting Facility at the Drehid WMF. This source is anticipated to generate up to 40,000 TPA of biostabilised waste which requires appropriate disposal and will be placed in the new landfill. Biostabilised waste is currently accepted at the existing landfill for disposal and for use as daily cover, where appropriate, and meeting the required criteria for biostability. Biostabilised waste may also be

[3] Water Research Centre Limited (WRC), *DWtE – Characterisation and Classification of IBA* (November 2019)

accepted from external sources such as other compost or MBT facilities subject to meeting the above referred criteria.

Waste for Engineering Purposes:

Access onto and within the landfill waste body is required for the safe and efficient tipping of incoming materials at the active face. At the Drehid landfill, there is no transfer of incoming waste to off-road dump trucks as can be the case in some landfill facilities. Road legal haulage trucks bringing waste to the facility are provided with safe haul roads to deliver waste directly to the tipping face. This approach requires the provision of suitable materials to form haul roads, turning areas and tipping platforms within and on top of the waste body. Most incoming waste materials described in the previous paragraphs are unsuitable for his purpose, and therefore appropriate waste material for these engineering purposes is required. C&D fines and rubble are commonly used for this purpose. Only inert waste such as greenfield soils can be used outside the liner for engineering purposes / final capping. The use of this waste material for engineering purposes avoids the import of virgin non-waste quarried aggregates and therefore the use of this waste material for this purpose is considered a recovery activity, as opposed to a disposal activity. This is in accordance with the requirements of Conditions 2.2.2.2 and 11.12 of the current IE Licence (Reg. No. W0201-03) and would be anticipated to be required in any new IE Licence for the facility issued by the EPA.

In addition, waste crushed glass is often used for engineering purposes around landfill gas collection pipework in the waste body to optimise the collection of landfill gas. A depth of between 0.8 – 1.2 m of glass is generally applied around the gas collection pipework. Similarly, this avoids the import of virgin non-waste materials, and this can be described as a recovery activity.

In order to mitigate against odours, windblown litter and scavenging by birds, a layer of daily cover (typically 300-400 mm in depth) is applied to the working face at the end of each day. Daily cover typically comprises C&D fines but may also include biostabilised waste subject to meeting EPA requirements as set out in the *Guidance Note on Daily and Intermediate Cover at Landfills* (2014). Waste material used for this purpose is classified as being recovered.

Further, when the active tip face moves along the landfill it leaves behind large areas that require temporary/intermediate cover. These intermediate areas use a combination of C&D fines and soils. The primary function of this material is to reduce the ingress of rain which generates leachate and the emission of fugitive landfill gas. The placement of adequate depths of intermediate cover (400 – 500 mm) as per the above EPA Guidance is essential to minimising odour emissions. Adequate depth of intermediate cover is also necessary in order to facilitate the harvesting of good quality landfill gas which will be diverted to the on-site landfill gas engines. Inadequate depths of intermediate cover may lead to the ingress of oxygen into the landfill which results in a deterioration in landfill gas quality. Again, C&D fines and soil material used for this purpose is classified as being recovered.

2.2.4.2 Composting

Waste accepted for composting will be of an identical nature to the waste currently accepted at the existing Composting Facility. This waste comprises source segregated bio-waste and organic fines from household, commercial or industrial sources and is both biodegradable and putrescible in character.

Source segregated bio-waste arises from the separate collection of food and garden waste from domestic, commercial and industrial customers. The collection of this material is primarily

facilitated through the provision of 'brown bins' to customers and the segregation of the material is carried out by the customer at source. Currently, brown bins are provided to domestic users mainly in towns and cities, however this will be expanded to all households across the country over the next two years which will increase the quantities of source-segregated bio-waste requiring treatment. In addition, current waste policy is to improve source segregation of bio-waste from commercial facilities which will also lead to higher volumes of this waste source requiring treatment.

Organic fines are the organic element of MSW (black bin waste) collected from domestic, commercial and industrial customers and comprises mainly food and garden waste. The material is the small fraction (undersized) material generated from the screening and pre-treatment of collected MSW following an initial course shredding process. The organic quality of organic fines generated in this way is not as high as source segregated bio-waste due to the potential presence of small fragments of contaminants, such as glass, plastic, metals and paper.

Both source segregated bio-waste and organic fines material are regarded as 'Animal By-Products' pursuant to *Regulation (EC) No. 1069/2009 of the European Parliament* at an EU-wide level and the *European Union (Animal By-Products) Regulations 2014 (S.I. No 187 of 2014)*, as amended, at a national level. This requires that the compost infrastructure is approved by the DAFM for the acceptance and treatment of ABPs. The existing Composting Facility has approval from the DAFM (Licence No. Comp 63), and further approval will be obtained from the Department for the proposed increased waste throughput as well as the additional composting capacity to be provided in the new building extension as described in Section 2.2.3. This has been discussed with the relevant inspectors from DAFM and no concerns on the proposed waste intake increase have been raised.

2.2.4.3 MSW Processing

The new MSW Processing infrastructure will have capacity to accept up to 90,000 TPA of untreated MSW. This waste will be collected directly from customers (black bin waste) in RCVs or delivered in bulk haulage vehicles, typically from further distances. The waste brought to this new facility may not have previously been subject to waste treatment. Incoming MSW will only be from waste management customers and no MSW will be accepted from the general public.

The MSW proposed for intake will typically be direct from black bin waste and is likely to contain a high degree of recyclable materials, such as plastics and metals, as well as biodegradable materials.

Based on Bord na Móna's knowledge of the industry through their waste collection business, it is estimated currently that 15,000 TPA of incoming MSW will be via RCVs with the remaining tonnage being delivered in bulk trailers, however this is subject to variation as the market changes and/or other facilities or outlets for MSW come available. Incoming waste in RCVs will be from local sources (Kildare, North Offaly, and South Meath) and will predominantly come from existing Bord na Móna Recycling RCVs which provide kerbside collection of household and commercial waste. Bulk deliveries may come from waste management companies, including Bord na Móna Recycling Waste Transfer Stations, across the country.

2.2.5 Output from the Proposed Development

The main outputs from the new landfill infrastructure will be leachate generated from water passing through the waste body and landfill gas generated from the decomposition of waste materials. Emissions of odour and noise will also be generated, these are discussed in the relevant chapters of this EIAR.

The leachate quantity generated is estimated as ranging from 6,878 m^3 in the first full year of operation to 26,704 m^3 at peak generation in 2046. Annual leachate quantities will vary over the lifetime of the facility depending on annual rainfall, the area of active landfill, area of temporary capping and area of final capping. Leachate generation will continue after the landfill has ceased accepting waste and the final capping is complete, however the leachate quantities post-capping will be relatively low and will continue to decrease during the restoration and aftercare phase of the landfill. Further details on leachate generation are provided in Section 2.4. Leachate generated in the existing landfill was transferred to the following facilities in 2021:

- JFK Environmental, John F. Kennedy Industrial Estate, Dublin – W0196-01
- Leixlip Wastewater Treatment Plan (WWTP), Kildare – D0004-01
- Ringsend WWTP, Dublin – D0034-01
- Rilta Environmental (now part of Enva), Rathcoole, Dublin – W0192-01

As part of consultation on the proposed development, an EIA Scoping Report was issued to Uisce Éireann informing them of the proposed development works. Leachate generated from the existing landfill is currently accepted by Uisce Éireann at their WWTPs and the composition of leachate from the proposed development will be of a similar nature. Therefore, future leachate generated from the proposed development will also be suitable for acceptance at Uisce Éireann operated WWTPs. In addition, there are a number of waste management companies, including and similar to JFK Environmental and Enva, who are permitted and licensed to accept leachate which will be generated from the proposed development.

Landfill gas is generated in the existing landfill from biodegrading waste. The landfill gas is collected in a series of vertical wells and horizontal collector drains located within the waste body. This gas is collected and diverted to the existing landfill gas management compound which includes landfill gas flares and LGUP. Excess or unsuitable landfill gas which cannot be utilised in the combustion plant is flared off as per standard practice at such installations [4]. An upgraded landfill gas flare was installed at the facility in 2021/2022 to ensure optimum treatment of waste gas. Landfill gas generated from the proposed development will be collected, diverted and treated in an identical manner to the current arrangement. New landfill gas collection pipework will be installed within the new landfill and will be connected to the existing flares and LGUP in the landfill gas compound. The existing flare and utilisation plant is suitable to treat gas generated from the new landfill and no additional gas treatment infrastructure is required as part of this proposed development.

Outputs from the composting process will comprise a biostabilised waste material which has achieved the required EPA enforced biostability levels (refer to Section 2.2.4.1) and has undergone treatment in the plant in accordance with the DAFM requirements for handling ABP. Due to the nature of the materials which will be accepted at the compost facility, the output material will not be of a standard which makes the material suitable for spreading on land or use as a soil improver. Therefore, this material will be disposed of to landfill or recovered in the landfill for use as daily cover or intermediate cover. Based on an input rate of 30,000 TPA of suitable organic waste and 60,000 TPA of MSW, the estimated output of biostabilised waste from the proposed MSW Processing & Composting Facility will be approx. 40,000 TPA. Upon cessation of landfilling activity at the proposed development (25 years from commencement), biostabilised wastes generated from the composting process will be removed off-site for disposal to landfill or other suitable treatment/use which may be in place at that time.

[4] EPA, *Guidance Note on Landfill Flare and Engine Management and Monitoring (AG7)* (2012)

Process losses in the form of carbon dioxide and water vapour will account for approximately 30,000 TPA from the composting and MSW processing activities. Water vapour and leachate collected in the floor of the building will be recirculated into the composting process to avoid the requirement to dispose of leachate from the process and to minimise the consumption of raw water required to maintain optimum moisture content in the composting tunnels.

The MSW processing plant will include for the detection and segregation of plastics and metals from the incoming waste stream which will be stored in dedicated bays and baled/packaged for removal off-site for further processing. The remaining oversize material (>60 mm) will be diverted to dedicated storage bays to be baled/packaged and removed off-site as RDF or for further processing into SRF products. These products can then be utilised in Waste-to-Energy plants, co-firing in approved cement kilns or exported for treatment abroad. The quantity of outputs from the MSW processing activity which will be removed from the Drehid WMF will be approx. 20,000 TPA. These output materials will be transferred off-site in bulk haulage vehicles to approved waste facilities located in the GDA.

2.2.6 Proposed Site Infrastructure

Sections 2.2.1, 2.2.2 and 2.2.3 previously, outline the main waste treatment infrastructure proposed as part of this development. This section sets out the ancillary infrastructure which will support the waste activities at the facilities already described.

2.2.6.1 Soil & Stones and C&D Waste (Rubble) Processing Building

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

Screening equipment located within the building will remove stones from the incoming soils to produce a clean soil material. Subject to passing Waste Acceptance Criteria (WAC) testing for inert soil, this material can be recovered for use as capping and/or cover material and would reduce the requirement to import materials specifically for this purpose. Similarly, C&D rubble accepted at the facility will be routed to this building for screening and production of recycled aggregate. It is envisaged that approximately 70,000 TPA of soil & stones and C&D rubble will be processed in this building.

In relation to recycled aggregate, the EPA have issued a consultation on *Draft End of Waste Criteria for Recycled Aggregates* which closed in February 2023. This is being developed to establish a formal protocol for reclassifying appropriate wastes as non-waste material in accordance with the provisions set out in Article 28 of the *European Communities (Waste Directive) Regulations 2011*. These criteria and guidance, when implemented, will provide a protocol of the handling, treatment and use of waste materials to create a recycled aggregate. Once End of Waste status has been achieved for the material, it ceases to be waste and can be used for engineering purposes.

The new development will require the construction of new access roads and yards around the landfill footprint and between the new infrastructure as shown on Drawing No. 11290-2010 of Appendix 2-1. This infrastructure will be developed over time as required and the provision of

this processing facility to enable reclassification of incoming C&D rubble waste streams will reduce the quantity of virgin materials to be brought into the site for specific engineering purposes. This proposal ensures maximum utilisation of existing materials in accordance with the principles of the circular economy [5] and will reduce the consumption of virgin raw materials. In addition, the reuse of this material within the Drehid WMF will reduce the traffic associated with the import of virgin materials as well as the noise and air quality effects of the HGV traffic movements.

This processing building will be constructed as a single-bay steel portal framed structure with reinforced concrete walls, metal cladding and will include roller shutter doors for ease of access for machinery. The building will be 7.6 m in height at the eaves (90.95 m AOD) and 12.5 m in height at the ridge (95.85 m AOD). The building will have a footprint of 27 m x 27 m with a concrete reinforced floor. Access will be via a 6 m wide door opening which extends the full height of the building to allow tipping trailers to offload material at the entrance. Plans, elevations and sections of the proposed structure are provided in Drawing No. 11290-2085 of Appendix 2-1.

Peat material will be stripped from the footprint of the building to suitable subsoil bearing material. Building foundations will be constructed and sub-base material laid for construction of the floor slab and rising walls. The perimeter around the processing building will comprise concrete hardstanding to prevent the release of oil or fuel substances to ground from haulage vehicles and machinery operating at the facility. Drainage gullies will be installed in the concrete apron to divert storm water run-off into the surface water drainage network via a fuel/oil interceptor (see Engineering Services Report (ESR) in Appendix 2-3).

2.2.6.2 Maintenance Building

A new Maintenance Building will be provided as part of the proposed development at the location as shown on Drawing No. 11290-2010 of Appendix 2-1. This building will provide critical facilities for the daily operation of the facility including a location for the maintenance and repair of site machinery, such as dozers, excavators and dump trucks. The new Maintenance Building will replace the existing maintenance building which itself will be used for additional operational storage.

The new Maintenance Building will be constructed as a single-bay steel portal framed structure with metal cladding and will include roller shutter doors for ease of access for machinery. The building will be 7.6 m in height at the eaves (90.95 m AOD) and 9 m in height at the ridge (93.95 m AOD) with a footprint of 27 m x 25 m. The building floor will comprise a reinforced concrete slab with a service pit for machinery works. The building will include secure areas for storage of power tools and other small plant and equipment commonly used at the facility. The building will be supplied by 3-phase electrical power, include both security and fire alarm systems and provide welfare facilities, canteen, office space, laboratory, first aid and storage. Plans, elevations and sections of the proposed structure are provided in Drawing No.'s 11290-2096 and 2097 of Appendix 2-1.

As per Section 2.2.6.1, peat material will be stripped from the footprint of the building to suitable subsoil bearing material. Building foundations will be constructed and sub-base material laid for construction of the floor slab and rising walls. The perimeter around the Maintenance Building will comprise concrete hardstanding to prevent the release of oil or fuel substances to ground during machinery maintenance or servicing activities. A vehicle wash bay area including

[5] The Circular Economy | Environmental Protection Agency (epa.ie) (Accessed 06 December 2022)

containment sump will be located adjacent to the Maintenance Building. Drainage gullies will be installed in the concrete apron to divert storm water run-off into the surface water drainage network via a fuel/oil interceptor.

2.2.6.3 Bunded Fuel Storage Area

Adjacent to the new Soils Processing Building will be a new storage area for fuels used on site. This will comprise a 60,000 litre double walled two-chamber storage tank divided as 45,000 litre for diesel fuel used for site machinery and 15,000 litre for storage of kerosene fuel used for heating purposes in the administration building and welfare areas. Smaller quantities of oils (hydraulic, gear and engine oils) for servicing and maintenance of machinery will be stored within the Maintenance Building on bunded spill pallets.

In compliance with the EPA's *IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities* (June 2004), the double walled storage tank will be equipped with leak detection monitoring to identify any issues with the internal containment system.

This fuel storage will be located on a concrete hardstand area to the rear of the Soils Processing Building and filled into a mobile fuel bowser to transfer to site machinery. This hardstand area will drain to the surface water drainage network via the fuel/oil interceptor to ensure any leaks or spills during refuelling are contained and retained. The location and sizing of the fuel tank is shown on Drawing No. 11290-2085 of Appendix 2-1.

2.2.6.4 Laboratory Facility

It is proposed to provide a laboratory in the new Maintenance Building which will allow for the on-site testing of routine leachate, groundwater and surface water samples collected at the facility. The current laboratory facility in the administration building will be relocated to this area. Basic parameters for control measures (i.e., dry solids, volatile solids and pH) in the biological treatment process will also be measured in this laboratory. A stove and a small oven for drying samples will be provided along with portable instruments such as pH and temperature meters, conductivity meters etc.

The full suite of analyses for leachate, groundwater and surface water will not be carried out in the site laboratory. An external, appropriately accredited environmental laboratory, such as Advanced Laboratory Testing (ALT) Ltd. or similar, will carry out the analysis of samples in accordance with the requirements of the EPA IE Licence conditions.

2.2.6.5 Welfare Facilities

It is proposed to provide welfare facilities in the new Maintenance Building which will comprise drying rooms, changing rooms, toilets, showers and a canteen. These welfare facilities will be for operational facility staff and will be in addition to the welfare facilities already in place in the Administration Building. Wastewater from the welfare facilities is discussed in Section 2.2.6.8 and the ESR in Appendix 2-3.

The design and layout of the new welfare building will make the necessary provisions for staff in accordance with the *Safety, Health and Welfare at Work Act 2005* and associated legislation.

An indicative layout of the welfare facilities is shown in Drawing No. 11290-2096 of Appendix 2-1.

2.2.6.6 Site Roads and Parking

An additional lane will be provided on the existing access road for incoming traffic as shown on Drawing No. 11290-2046 of Appendix 2-1 and is described in Section 2.2.7.5.

New internal roads will be provided as shown on Drawing No. 11290-2045 of Appendix 2-1 to facilitate the safe and efficient movement of traffic within the development. A new road will be constructed on a phased basis around the perimeter of the new landfill footprint which will tie in with the perimeter road around the existing landfill.

Roads and parking areas will typically be designed as bituminous macadam pavements or, where appropriate, as concrete pavements. Impermeable concrete hardstanding will be used around the perimeter of the MSW Processing and Composting Building, Soils Processing Building, Maintenance Building and fuel storage area due to the nature of activities in these areas. Drainage from hardstand areas will be to the surface water drainage network via a Class 1 fuel/oil interceptor.

2.2.6.7 Surface Water Infrastructure

The surface water network has been designed to incorporate gravity flow, where feasible. The majority of surface water flow from the site originates from the landfill capping. This runoff is collected by the proposed swale network as shown on Drawing No. 11290-2014 of Appendix 2-1 and travels by gravity to the related surface water pumping station. Surface water runoff from all yard areas, buildings and impermeable hardstand areas will be collected via a network of pipes and channel drains as indicated on Drawing No. 11290-2014 of Appendix 2-1. This runoff will pass through a grit interceptor and Class 1 fuel/oil interceptor prior to reaching the pump station.

The surface water pump station will lift run-off from a sump into two surface water lagoons (referred to as SWL 5 and SWL 6). Bearing in mind the requirements of the Greater Dublin Strategic Drainage Strategy (GDSDS) and in order to avoid flooding of the site, a storage volume for a 1 in 100 yr storm event is provided with provision included for a climate change factor of 30%, as per the guidelines set out in the GDSDS. This determined a storage requirement of 9,600 m^3 for the site serviced by the two lagoons. This capacity is achieved through provision of 1 m of freeboard in the lagoons. Outfall from the surface water lagoons will be regulated using a flow control device to an appropriate greenfield run-off rate. This has been calculated as 113.39 l/s and is further detailed in the ESR in Appendix 2.2.

An additional construction stage surface water lagoon (SWL 7) will be located adjacent to the two permanent lagoons for the treatment of water from construction activity. The design and layout of SW7 will be identical to SWL 5 & SWL 6 and is presented on Drawing No. 11290-2050 of Appendix 2-1. On completion of construction activity, this construction stage lagoon will be decommissioned.

Water stored in the lagoons will be used for the following purposes:

- Supplemental supply for composting, where required;
- Supply for fire-fighting purposes; and
- Supply for operational and maintenance purposes, such as wheelwash replenishment, dust suppression and washing.

Outfall from the surface water lagoons will be diverted to an Integrated Constructed Wetland (ICW) area via drainage pipes as shown on Drawing No. 11290-2014 of Appendix 2-1. The ICW area will provide a further step in the treatment train to minimise suspended solids and

ammonia loading in the managed waters. Discharge from the ICW will be to an existing bog drain adjacent to the engineered ponds. The indicative layout of the ICW area is shown in Drawing No. 11290-2064 of Appendix 2-1 and the development and construction of the ICW is described in the ICW reports in Appendix 2-4.

2.2.6.8 Foul Water Infrastructure

Potential sources of foul water from the proposed development are:

- Wastewater from sanitary facilities;
- Overflow water from the wheel wash;
- Leachate from MSW processing and compost facility; and
- Leachate from the new landfill.

Leachate/process wastewater generated in the new landfill and MSW Processing and Composting Facility is discussed in Section 2.2.6.9.

Sanitary wastewater (i.e., wastewater from toilets, washing facilities, kitchens etc.) will be generated in the new Maintenance Building and technical room at the MSW Processing and Composting building. This wastewater will be collected and routed to a new primary treatment tank located adjacent to the new Soils Processing Building as shown on Drawing No. 11290-2014 of Appendix 2-1. The primary treatment tank will separate solids from liquid waste and the liquid effluent will be directed to an existing wastewater storage tank located in the leachate storage compound. This sanitary wastewater will be blended with landfill leachate, as per current sanitary wastewater management, and removed off-site on a regular basis to Uisce Éireann WWTP's or other approved waste facilities. Refer to Section 2.2.5 for description of outlets for leachate. Solids/sludge retained in the treatment tank will be collected and removed off-site by a suitably permitted wastewater tanker on a regular basis as recommended by the equipment supplier and loading rate. This sludge material is typical of municipal wastewater sludge and will be treated as such at a suitable off-site location.

The proposed foul drainage layout is shown on Drawing No. 11290-2014 of Appendix 2-1 and also shows the location of the proposed new underground primary treatment system. Foul loading calculations and indicative treatment plant design are provided in the ESR in Appendix 2.2.

Sanitary effluent from welfare facilities for construction staff will also be connected to the proposed new foul drainage network as shown on Drawing No. 11290-2014 of Appendix 2-1. Construction staff will not be permanently on site but will be on-site during initial facility development and the phased construction of the landfill over its 25-year lifetime. Wastewater loading from construction staff is included in the calculations in Appendix 2-3.

The foul drainage network will be gravity fed into the new primary treatment system and pumped via rising main into the wastewater holding tank in the leachate storage compound due to the existing site levels. All foul water will be fully isolated from the surface water drainage infrastructure.

The existing wheelwash has a self-contained water recirculation system and water is only discharged to the foul water network during the periodic replenishment of the dirty water with fresh water. There is no requirement to install a new wheelwash system at the site as all incoming HGVs associated with the proposed development will use the existing system. Upon replenishment, the dirty water from the wheelwash is discharged into the existing foul drainage network and transferred to the wastewater storage tank for blending with landfill leachate and removal off-site.

A temporary wheelwash will be installed on the construction compound access for construction stage traffic. This will be a recirculating water type and dirty water will be discharged to the foul drainage network as required.

2.2.6.9 Leachate and Process Water Infrastructure

Leachate/process wastewater will be generated in both the new landfill and within the MSW Processing and Composting Facility.

A leachate collection system installed as part of the basal liner for the new landfill will collect leachate within the liner and transfer it to raw leachate storage tanks. There are two existing 200 m^3 glass reinforced plastic (GRP) leachate storage tanks installed within a concrete bund located adjacent to the landfill gas management compound as shown in Figure 2-1. An additional 200 m^3 GRP tank will be installed within this bund at the location as shown on Drawing No. 11290-2010 of Appendix 2-1 to facilitate storage of additional leachate generated from the new landfill as well as additional sanitary wastewater as per Section 2.2.6.8.

Leachate generated from waste in the existing compost facility is collected within the building and transferred to process water storage tanks located within the building. This leachate is recirculated to adjust the moisture content of the incoming waste to the compost facility as needed. As described in Section 2.5, optimum moisture content is important to achieving the best conditions for waste composting. Any excess leachate generated in the compost facility is diverted to the leachate storage tanks.

In the new MSW Processing and Composting Building, a similar arrangement will be in place where leachate from handling, processing and drying of MSW as well as from the additional composting infrastructure will be collected within the floor drainage and diverted to storage tanks within the building. Leachate will be recirculated to add to composting material as necessary to achieve an optimum moisture content. Any excess leachate will be diverted to the leachate storage tanks.

Suitably permitted waste contractors collect leachate from the storage tanks on a regular basis and remove off-site to WWTPs or other suitably licensed waste facilities. This is discussed further in Section 2.4.3.

2.2.6.10 Building Ventilation and Odour Control

The existing composting facility includes a building ventilation 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 regular air changes within the building also provides appropriate and comfortable working conditions for plant operators.

As part of the proposed increase in waste intake at the existing compost facility, a new odour abatement system will be installed to treat air extracted by the building ventilation system and the process air exhausted from the composting process. This new odour abatement system will be located in a new 'lean-to' extension to the south of the existing compost building as shown on Drawing No. 11290-2081 of Appendix 2-1 and will include an acid scrubber and biofiltration system.

Similarly, the new MSW Processing and Composting building will incorporate a building ventilation system to control air within the building, maintain negative air pressure to prevent odour/dust release and to divert controlled air through an odour abatement system located on the southern façade of the building as shown on Drawing No. 11290-2081 of Appendix 2-1. This odour abatement system will comprise biofilters and acid scrubber which will be located in a separate technical room as shown on the drawing.

Further information on building ventilation and odour control of the composting process is provided in Section 2.5.

2.2.6.11 Fire Control

A number of fire control features are currently in place at the existing facility and will be extended to incorporate the proposed development infrastructure. These include fire alarms, firefighting water supply from the surface water lagoons, fire-fighting water mains and fire hydrants.

The detailed design of the new MSW processing and composting facility will incorporate design for fire prevention, fighting and safety. The fire-fighting controls and alarms will be connected to the existing site wide alarm system.

In addition, the following fire control measures will also be implemented:

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

In the event of a fire at the proposed development, any potentially contaminated firewater run-off will be collected in the surface water drainage network and will be held in the surface water lagoons. This firewater will be sampled and analysed in a laboratory to determine if the water is suitable for discharge from the site to the adjacent watercourse via the ICW. Where the results indicate that the water is not suitable for discharge, it will be suctioned into tankers and removed off-site to a suitably licensed wastewater treatment plant or waste facility.

2.2.6.12 Lighting

Lights will be installed at the facility in key locations; on the landfill perimeter road for way marking, adjacent to the contractor's yard and at the leachate headwalls for visibility at monitoring and control equipment.

Lighting design impacts on ecological receptors, namely bats, has been taken into consideration. In general, the site lighting will be kept to a minimum to minimise impacts ad where required, the design of lighting installations will be sensitive to commuting and foraging routes for bats. Lighting will not be installed in non-critical areas and specific task lighting will be installed only the locations where its required, such as leachate headwalls. Low colour temperature LED lights

will be installed and luminaires to be installed will be of a full cut off/flat glass type, with no tilt (0% uplight) so that they minimise glare and light spill.

A *Lighting Design Ecological Considerations* report has been prepared by Malone Group (Mechanical and Electrical Engineers) and is included in Appendix 6.3 of this EIAR.

2.2.6.13 Other Services

Other services that will be required as part of the proposed development include:

- 400 v three phase electricity extended to the required areas across the facility;
- Standby pumps;
- Gas detection systems in the site buildings and surrounding the landfill footprint;
- Maintenance and management of the existing meteorological station; and
- Extension of IT, telephone and CCTV systems across the new development areas.

As part of the proposed development, it will be necessary to divert existing overhead power lines running along the access road to the on-site substation. It is proposed to underground these power lines within new road infrastructure as shown on Drawing No.11290-2015 of Appendix 2-1. These proposed works will be carried out in agreement with and to the standards required by the ESB.

2.2.7 Operational Management

This section outlines the key activities to be carried out as part of the day to day operation of the proposed development and are set out in accordance with the measures outlined in the EPA's *Landfill Manuals: Landfill Operational Practices* (1997) document.

2.2.7.1 Hours of Operation

The proposed development will operate six days per week (Monday to Saturday inclusive) between the hours of 07:30 and 19:00.

While machinery handling and transferring waste in the MSW processing and compost plant (proposed and existing) will only operate within the above hours, the composting process will operate on a continuous basis as the stockpiled material breaks down and stabilises in the designated compost tunnels. Odour controls and biodegradation monitoring processes will be fully automated to allow them to operate effectively on a continuous basis.

Pumping of leachate from the landfill to the storage compound and the drawing of landfill gas into the compound for electrical generation/flaring will also be carried out on a continuous basis (refer to Section 2.3.3 and 2.3.4). Monitoring equipment will be connected to a central control system which will notify designated persons, such as the Facility Manager or other designated emergency contact, in the event of abnormal readings outside of the defined operating hours.

Waste material will only be accepted into or depart from the facility between the hours of 07:30 and 18:30 (Monday to Saturday). In exceptional circumstances, such as vehicle breakdown or similar unavoidable delay, the facility will permit the late arrival of waste after 18:30, however this will only be permitted where there is a genuine extenuating circumstance and is required in order to prevent illegal parking of haulage vehicles that may have travelled a long distance. Waste that is accepted at the facility at or near closure time, will be unloaded at the appropriate waste reception area, stored overnight and processed during the next working day.

2.2.7.2 Site Management Structure

The management of the proposed development will generally be in accordance with that outlined in Table 2-3. It is envisaged that these permanent on-site staff will be employed directly by Bord na Móna. The personnel employed at the facility will be suitably experienced and qualified to fill the role for which they will be employed.

Table 2-3 – Site management structure

Position	Duties/Responsibilities	Qualifications/Training
Facility Manager	Overall management and responsibility for the operation and maintenance of the proposed development	Engineering / Science degree or equivalent
Environmental Manager	Responsibility for environmental compliance of the proposed development	Engineering/Science degree
Maintenance Manager	Responsibility for overall maintenance of the proposed development	Engineering Certification or equivalent
Composting Process Supervisors	Overall supervision of the composting process	Training in waste management
MSW Processing Supervisors	Overall supervision of the MSW processing process	Training in waste management
Landfill Manager	Management of the day-to-day operation of the landfills, including the management of surface water, leachate and landfill gas.	Training in waste management
Waste Control Operator	Waste acceptance Operation of weighbridges	Training in EPA waste acceptance procedures
Machine Operators	Waste handling for the proposed facility	Training in operation of on-site machinery
Maintenance Technicians	Execution of preventative maintenance programmes and emergency maintenance tasks	Appropriate mechanical and electrical trade qualifications
General Operatives	General maintenance and repairs, quality control, cleaning etc.	

2.2.7.3 Site Access

Access to the proposed development will be via the existing permitted site entrance, located on the R403 Regional Road. The existing access comprises a t-junction from the R403 to a dedicated entrance to the Drehid WMF. The facility entrance is clearly identified with stone walls and signage as shown in Figure 2-5. The site access is controlled using metal gates and is monitored by security from the weighbridge kiosk.

Figure 2-5 – View of site entrance from R403 looking north-west (Source: Google Maps)

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

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

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

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

Appropriate signage on the access road and at the proposed development will direct waste hauliers, visitors and employees to the designated areas.

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

2.2.7.4 Site Security

Existing site security arrangements to prevent unauthorised access to the facility which will be maintained and expanded as part of the proposed development include:

- The existing entrance from the R403 Regional Road comprises a 2.4 m high stone wall with pillars and metal palisade fencing. The road entrance is secured with a 2.4 m high and 7 m wide rolling metal security gate which is closed outside of normal operating hours. In addition, there is a cantilever barrier on the incoming lane to restrict access to the facility as required;
- The existing perimeter fencing comprises a post and chain link fence which surrounds the waste facility and includes an additional palisade security fence close to the weighbridge to prevent access to the facility. A new post and chain link fence will be erected around the perimeter of the new infrastructure to maintain a secure facility boundary.
- An existing CCTV system monitors the entrance gate from the R403 and is visible in real-time for operators at the weighbridge kiosk. Additional CCTV cameras are located throughout the existing facility and will be extended to include the new infrastructure; and
- Anti-intruder alarms are located in the facility buildings and will be extended to the new maintenance building and upgraded in the new welfare building.

The location of the entrance security fencing and perimeter post and chain link fence is shown on Drawing No. 11290-2006 with proposed fence details set out on Drawing No. 11290-2057 of Appendix 2-1.

In addition to the above, a facility notice board is installed at the entrance gate specifying the opening times and contact details for facility personnel. This signage will be updated to reflect the requirements of the expanded facility in accordance with the anticipated future EPA IE Licence requirements.

The key site security infrastructure will be checked daily, and any damage repaired immediately upon discovery. Where repairs require specialist contractors, Bord na Móna will endeavour to have permanent security repairs completed with 48 hrs.

2.2.7.5 Traffic Control, Parking and Weighbridge

All traffic to the proposed development will access the facility by turning into the Bord na Móna landholding from the R403 and travelling along the private access road to the weighbridge as shown in the Site Layout Plan (Figure 1-2).

Discussion and analysis of traffic management to and from the proposed development is dealt with in more detail in Chapter 14.

Given that the private access road from the R403 to the facility weighbridge is c. 4.8 km long, there is no potential for waste hauliers entering the site causing a queue on the public road. A dedicated ghost island priority junction is provided for vehicles coming from Allenwood turning right into the facility. In addition, there is a refuge turning area alongside the private access road in advance of the main security gate. This area provides safe space for HGVs to turn and re-access the R403 where the security gate is closed. This area is for turning only and parking is not permitted here. Signage to that effect is erected and facility security enforce this through use of CCTVs at the entrance gate.

Approaching the weighbridge along the access road, a new incoming waste queuing lane will be created to allow for incoming HGVs to safely queue while awaiting access onto the weighbridge. This queuing lane will have an overall length of c. 280 m and will allow for queuing of up to 15 no. HGVs. The queuing lane will be in addition to the existing two-lane road and will be constructed alongside the existing incoming lane as shown on Drawing No. 11290-2046 of

Appendix 2-1. Incoming cars, light commercial vehicles and construction traffic which is not required to cross the weighbridge will bypass this queuing lane using the existing incoming lane. A controlled crossing point at the weighbridge will be provided and appropriately identified with signage and road markings. An existing traffic light system will be used to notify incoming waste HGVs when they can proceed onto the weighbridge. Drivers will be notified in advance that they are to remain in their vehicles while in the queuing lane.

Incoming construction traffic will divert right towards the construction compound in advance of the weighbridge as shown on Drawing No. 11290-2046 of Appendix 2-1 to minimise interaction with operational HGV traffic. Staff cars will use the incoming by-pass lane to access the existing carpark at the administration building or the new car park to the rear of the maintenance building. Visitors to the site will use the existing car park at the administration building to sign in at the facility for safety and security purposes.

There are currently 23 no. parking spaces provided adjacent to the administration building including 1 no. disabled space and 4 no. spaces with electric charging facilities. It is proposed to provide an additional 22 no. parking spaces for Bord na Móna employees in a new car-park located to the rear of the Maintenance Building as shown Drawing No. 11290-2010 of Appendix 2-1. Of these 22 no. new spaces, there will be 2 no. spaces for disabled users (3 no. in total at the facility) and 3 no. spaces with electric charging facilities (7 no. in total).

Parking for visitors will remain at the administration building and signage will be erected for visitors to direct them to the appropriate parking area and highlighting the specific parking provisions.

The existing weighbridge will be retained in its current position and operate in accordance with existing procedures. This includes the use of a traffic light system and cantilever barriers to control access onto the weighbridge and a number plate recognition system to efficient recording of HGV movements in and out. All incoming and outgoing waste haulage vehicles will be held on the weighbridge while waste transfer paperwork is checked by the weighbridge operators. These checks include the weight of the vehicle, waste source, waste type and haulier details. The checking of haulier details will include confirmation of appropriate waste collection permits for the type of waste being carried.

All hauliers bringing waste into the Drehid WMF are required to be pre-approved prior to arriving at the facility so that incoming waste composition is known in advance and checks at the weighbridge are carried out with maximum efficiency. Any unauthorised incoming waste hauliers or hauliers with incorrect waste transfer paperwork will not be permitted access to the facility and will be diverted to the quarantine area until the correct paperwork is provided or, where the haulier is not approved, to turn and exit the facility immediately. Pre-approved hauliers will be provided with a copy of the permitted public road haul routes to and from the facility along which they are required to travel. Further information on the haul routes is set out in Chapter 14.

2.2.7.6 Plant and Equipment

Mobile plant and equipment will be employed on-site for the proposed development for various activities such as moving materials within processes and transporting materials into the landfill. It is envisaged that the following additional mobile plant and equipment required will be as follows:

Existing Compost Facility

- None – 2 no. loading shovels currently in operation and will be sufficient for proposed waste intake increase

MSW Processing and Composting Building

- 1 no. loading shovel in waste intake area
- 1 no. loading shovel for materials processing and loading of outgoing RDF / SRF material
- 1 no. loading shovel for filling new composting tunnels
- 1 no. additional tractor and trailer unit for transferring stabilised compost material to the landfill (1 no. tractor and trailer unit currently in operation)
- 1 no. forklift for loading outgoing recyclables

Soils Processing Building

- Mobile screening plant
- 1 no. excavator or loading shovel
- An existing dump truck will be used to haul processed materials onto the landfill

New Landfill

- No additional machinery required on new landfill as excavator, bulldozer and compactor in use on the existing landfill will transfer over to the new landfill upon commencement of waste placement

Plant Common to All Areas

- None – existing water tanker/bowser and road sweeper will be utilised within the proposed development

2.2.7.7 Waste Acceptance

Waste will be accepted at the proposed facility only from customers who are holders of a waste collection permit, unless exempted, under the *Waste Management (Collection Permit) Regulations* 2007 (S.I No. 820 of 2007) as amended. As per the current facility arrangements, the proposed development will not accept waste delivered directly by the general public and a civic amenity facility will not be provided at the site.

Waste contractors using the facility will be required to have a contract with Bord na Móna and the site waste acceptance procedure will apply to all waste deliveries to the site. This will ensure that all contractors will be assessed in advance and that the general composition of the waste will be known. Any contractors who arrive on-site without such a contracted agreement will be refused entry and turned away.

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

- the date;
- the name of the carrier (including if appropriate, the waste carrier registration 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, IE Licence, Waste Permit or Certificate of Registration Number;
- a description of the waste including the associated List of Waste (LoW) codes;
- the quantity of the waste, recorded in tonnes; and

- the treatment, where applicable, to which the waste has been subjected.

Bord na Móna will 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 (Table 2-4) are required for the acceptance of material based on *EC 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 2-4 – Waste 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. consistency 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 wastes and 'quick check' of key relevant characteristics where appropriate.

Following satisfactory documentation check and initial on-site verification, of authorised vehicles at the weighbridge, these vehicles will be 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 will be removed to an Inspection Area for further investigation. If the non-conformity has been identified after unloading the waste, the waste will be loaded back on the truck and held in the Quarantine Area.

If a load has been rejected while still contained, the truck or trailer will be moved into the 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 be removed from the site by the carrier. The carrier will be required to notify Bord na Móna facility staff of the final destination of the waste load.

There is an existing Waste Acceptance Procedure in place at the facility (included in Appendix 2-6) which will be reviewed and updated to reflect the proposed development and requirements of a future revised IE Licence from the EPA.

2.2.7.8 Wheel Wash

The existing wheel wash at the facility will be retained in its current position adjacent to the Composting Facility. The existing wheel wash is positioned to ensure that waste vehicles leaving the facility do not carry excess waste onto the 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 wash water. Fresh water is supplied to the wheel wash from the on-site borehole or the surface water lagoons.

2.2.7.9 Fuel Storage

Fuel storage will be provided by way of a new 60,000 litre double walled two-chamber above ground storage tank as shown on Drawing No. 11290-2096 of Appendix 2-1. The tank will be used for storage of diesel for machinery (45,000 litre) and kerosene for heating purposes (15,000 litre).

Smaller quantities of oils (hydraulic, gear and engine oils) for servicing and maintenance of machinery will be stored within the maintenance building on bunded spill pallets.

2.2.7.10 Water Supply

The requirements and proposed source of water for the various elements of the proposed development are identified in Table 2-5.

Table 2-5 – Water supply requirements

Water Requirement	Source
Potable water	Water dispensers (delivered to the site)
Domestic non-potable water requirements (toilets, sinks etc.)	On site borehole
Firefighting requirements	On site surface water lagoons, with backup supply from on-site borehole
Process water requirements (non-potable)	Recycled leachate On site surface water lagoons
Water required for cleaning, wash-down and other operations requirements such as dust suppression	On site surface water lagoons On site borehole

Water supplied from the existing on-site borehole located to the north of the existing landfill is pumped to the required locations, via an existing water treatment plant (WTP) which is located in the administration building. The plant treats the water to reduce iron, manganese and ammonia for non-potable uses. Raw water demand for welfare facilities in the technical building and maintenance building will be provided from the existing supply as shown on Drawing No. 11290-2015 of Appendix 2-1. Calculations for water demand are set out in the ESR in Appendix 2-3.

New distribution mains pipework required for the proposed development will be 100 mm nominal diameter and, where possible, will be looped, as per best practice. However, where dead

ends occur, they will terminate in duckfoot hydrants as set out in the relevant guidance document[6].

Water from the existing and new surface water lagoons will be used for firefighting purposes and for process water requirements. A dedicated fire-fighting water main will be constructed as per the layout on Drawing No. 11290-2015 of Appendix 2-1. Fire hydrants, to comply with the requirements of the Building Regulations – Technical Guidance Document B (Fire Safety), will be located on this fire watermain.

2.2.7.11 Raw Materials and Energy

The volumes of excavated materials likely to be generated, and the volumes of suitable fill material likely to be required, during the construction stage are outlined in Section 2.7.4.

The estimated usage of diesel fuel, hydraulic oil, electricity and water is outlined in Table 2-6. Mobile equipment used in the Soils Processing Building will be powered by diesel fuel, and, as such, the electrical consumption rate, for lighting only, will be low.

Table 2-6 – Estimated raw materials and energy usage for proposed development

Material/Resource	Annual Usage	Amount Stored on Site
Engine, Gear & Hydraulic Oil	2,000 litres	1,000 litres
Electricity (MSW Processing and Composting Facility)	3,677 megawatt hours (MWh)	-
Kerosene	6,000 litres	15,000 litres
Diesel	c. 400,000 litres (based on current usage)	45,000 litres

2.2.8 Nuisance Controls

2.2.8.1 General

Operation of the proposed development will be carried out in accordance with a revised IE Licence for the overall Drehid WMF which will be issued by the EPA. The existing IE Licence (Reg. No. W0201-03) for the current facility has been in place since 2010 and all activities at the site are carried out in accordance with the Conditions set out in the Licence.

The Applicant has engaged with the EPA in respect of issuing a revised IE Licence to authorise the activities covered under the proposed development and the EPA have advised that an IE Licence Review is appropriate given the nature of the proposal and that the proposed activities constitute a continuation of existing operations. The Conditions of any future revision of the IE Licence will include measures to minimise or prevent nuisance to the public occurring as a result of the operation of the facility. The proposed limits associated with emissions from the facility are described in each of the technical assessments. A Complaints Register, detailing any and all complaints received from the general public in respect of the operation of the facility, will be maintained at the site. The following sections detail the proposed nuisance control measures to be undertaken at the site. The Applicant also undertakes to implement any further control measures which may be set out in a Grant of Planning Permission and Final Determination issued by the EPA.

[6] Department of the Environment and Local Government, *Site Development Works for Housing Areas* (1998)

2.2.8.2 Litter Control

The following measures are currently and will continue to be employed at the site to control litter:

- All waste entering the proposed development will be in covered vehicles. Bord na Móna will exclude any contractor failing to comply with this requirement from entering the site;
- Waste processing associated with the composting activity will take place within fully enclosed buildings;
- The approach roads to the proposed development site will be monitored on at least a daily basis and, in the event of litter being found on these roads, site staff will promptly remove it and deposit it in the appropriate manner at the facility;
- General clean-up and attendance work will be carried out regularly by site staff around the entire perimeter of the overall facility footprint, on all internal access roads and on approach roads;
- All waste will be deposited in a controlled manner in the landfill, offloaded into the compost building waste reception area or stored in the quarantine area. No waste will be stored, even temporarily, in any other undesignated area; and
- All site areas will be inspected and cleaned regularly. Inspections of the wider bog area will also be carried out on occasion and any litter found will be collected and deposited within the landfill.

Given the above litter control measures it is envisaged that there will be no nuisance associated with litter at the proposed development.

2.2.8.3 Vermin Control

It is acknowledged that poorly managed and operated 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 and these will be continued in order to control the population of vermin at the proposed development.

The composting process takes place within a completely enclosed building and all waste handling associated with the increased waste intake at the compost plant will be carried out internally. All plant, equipment and tipping areas will be cleaned regularly.

A Vermin Control Plan has been developed by Bord na Móna as part of the Environmental Management Plan (EMP) for all of the company's waste management facilities. This Plan incorporates site specific measures for the existing facility and will be expanded upon to include infrastructure from the proposed development. This Plan will incorporate the following elements:

- 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 describing any signs of vermin and highlighting any vermin attractions on site;
- Responsibility for the facility manager to act 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.

Records of vermin control will be kept on site for inspection by the EPA and/or KCC as required.

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

2.2.8.4 Odour Control

The following measures are implemented at the existing facility and will continue to be implemented as part of the proposed development to eliminate or minimise nuisance odour emissions:

- All aspects of the MSW processing and composting process will be undertaken in fully enclosed buildings;
- All waste delivered to the proposed development will be in covered/enclosed vehicles. Similarly, all leachate being removed from the proposed development will be in enclosed tankers;
- Access doors at the waste reception area of the MSW processing and compost building will be rapid closing doors, with an opening or closing time of approximately 20 seconds. Existing access points into the composting building will continue to be used;
- The core composting process will be undertaken in fully enclosed concrete composting tunnels located within the enclosed building - thereby providing double containment features;
- Air streams with a potential for high ammonia levels will be treated in an acid scrubber prior to biofiltration and release to atmosphere;
- The existing odour management plan at the facility will be updated to incorporate the additional infrastructure. This plan will include management strategies for the prevention of emissions and a strict preventative maintenance and management program for ensuring that all odour mitigation techniques remain operational at optimal capacity throughout all operational scenarios;
- The new odour abatement system at the compost building will be connected to the sites existing Supervisory Control and Data Acquisition (SCADA) system which allows for continuous monitoring of performance criteria. Should any parameter deviate outside of an accepted range, an alarm will be immediately generated. Critical alarms will be texted to selected mobile phones numbers thereby ensuring the communication of critical alarms to responsible individuals on a 24-hour basis;
- Good housekeeping practices, such as clean working areas, dedicated storage areas and regular wash-down, (internally and externally) and a closed-door management strategy will be maintained at all times;
- Biofilters will be compartmentalised to facilitate maintenance and replacement of media. Each biofilter will comprise of two sections such that treatment will be provided by one of the sections while the other section is being maintained;
- Biofilters will be covered and thereby isolated from extreme weather conditions (e.g. intensive rainfall or intensive heat) thereby providing optimum control of biofilter efficacy; and
- Treated air from the biofilters will be emitted through elevated vent stacks to facilitate appropriate residual odour dispersion.

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 will be used to measure the temperature in the composting tunnels. The SCADA control system will ensure that the composting temperature

does not exceed 65° C by adding more fresh process air to the composting mass. This will reduce the odour load in the process air being transported to the odour abatement system.

2.2.8.5 Fire Risk Control

A number of fire risk control measures will be implemented at the proposed development. 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 will be trained in fire prevention, control and emergency response procedures;
- Emergency response contact numbers (Fire Service, Gardaí, Ambulance and other agencies) will be posted in prominent locations around the facility;
- Automatic communication of fire alarms to mobile phone numbers of assigned responsible individuals;
- Fire extinguishers, smoke detectors and fire alarms will be provided in all facility buildings;
- A water bowser will be available to deal with any small fires within the facility; and
- Smoking will only be permitted at designated areas within the proposed development.

Water for fire-fighting will be provided from the proposed surface water lagoons on the site with a back-up supply from the existing on-site borehole where required. A firewater ring main will be installed to distribute water for fire-fighting to the new landfill and maintenance building and fire hydrants will be installed.

In the event of a fire at the proposed development, all firewater generated will be collected within the surface water drainage network and will pass into the surface water lagoons. The firewater will be contained in these lagoons for sampling and analysis prior to release to surface water. If the samples indicate contaminants in the water, tankers will be used to pump out the contaminated water and transfer to an off-site WWTP.

There is an existing Fire Prevention and Response Plan in place at the facility (included in Appendix 2-7) which will be reviewed and updated to reflect the proposed development and requirements of a future revised IE Licence from the EPA.

2.2.9 Screening and Planting

Screening and planting measures will be implemented as part of the phased development of the landfill to reduce and in some cases eliminate the visual impact of the new landfill infrastructure. Disturbance and removal of existing vegetation, re-vegetating areas and perimeter planting will be retained and protected in areas in close proximity to the construction works. No existing planting or vegetation outside of the works area on the remaining bog will be disturbed as part of the project.

Excavated peat will be used to create an environmental screening berm on the perimeter of the landfill footprint as per the existing landfill. This will ensure reuse of excavated materials within the project and provide screening of the landfilling works. The berm will be 4 – 6 m in height and constructed on a phased basis with the development of the landfill at the location as shown on Drawing No. 11290-2071 of Appendix 2-1. The berm will be planted with bands of native peatland tolerant woodland mix with remaining areas allowed to naturally revegetate over time.

The landfill mound will be capped on a phased basis as waste placement is completed and the final landfill capping will comprise a 1 m depth layer of subsoil and topsoil. The mound will be

planted with grass seed and allowed to revegetate. Planting of vegetation on the landfill mound will be carried out to integrate the mound into the surrounding environment and plant species will have due consideration for the root structure to prevent damage to the geomembrane liner installed as part of the capping.

Screening and planting measures are discussed in more detail in the landscape and visual impact assessment in Chapter 11. Further details on replanting of new vegetation are set out in Chapter 6 (Biodiversity).

2.2.10 Health and Safety

Key health and safety risks at the proposed development relate to unauthorised access and trespassing into the facility. Site fencing will be installed as shown on Drawing No. 11290-2006 of Appendix 2-1 to prevent unauthorised access and to remove the risk of members of the public entering the landfill during operations and construction as well as at night. Warning signs will be placed along the fencing at regular intervals informing people of the active waste facility and the potential hazards associated with the facility. CCTV will also be installed at key locations to monitor the perimeter fencing and access gates.

Workers and visitors to the site will all be required to undertake a site induction prior to leaving the administration building and will be provided with a *Health and Safety Handbook* by Bord na Móna outlining general advice for protection of health and safety as well as information specific to the Drehid WMF. Speed limit signs area erected at regular intervals along the private access road to remind drivers to keep below 50 km/h while driving into or out of the facility to reduce the risk of vehicle collisions on the access road.

All operations carried out at the facility will be in accordance with the requirements of the *Safety, Health and Welfare at Work Act 2005* as amended and all implementing regulations. Construction works will be carried out in accordance with the requirements of the Act and the *Safety, Health and Welfare at Work (Construction) Regulations 2006 to 2008*.

All visitors attending the facility are required to sign in at reception and are met by facility staff. No unauthorised persons are permitted to walk around the facility on their own. Access onto the active tipping face where heavy machinery is operating is limited to only essential persons and must be accompanied by Bord na Móna staff unless authorised for work purposes. Access for vehicles to the administration building car park is controlled from the weighbridge and CCTV cameras at the site entrance are also monitored from this location.

Within the site, there are dedicated access routes for incoming and outgoing waste vehicles with signage and barriers erected to segregate vehicles from pedestrians.

All buildings and site access will be locked during non-working hours. Machinery will be locked during non-working hours and parked within the confines of the proposed development site.

2.2.11 Environmental Monitoring

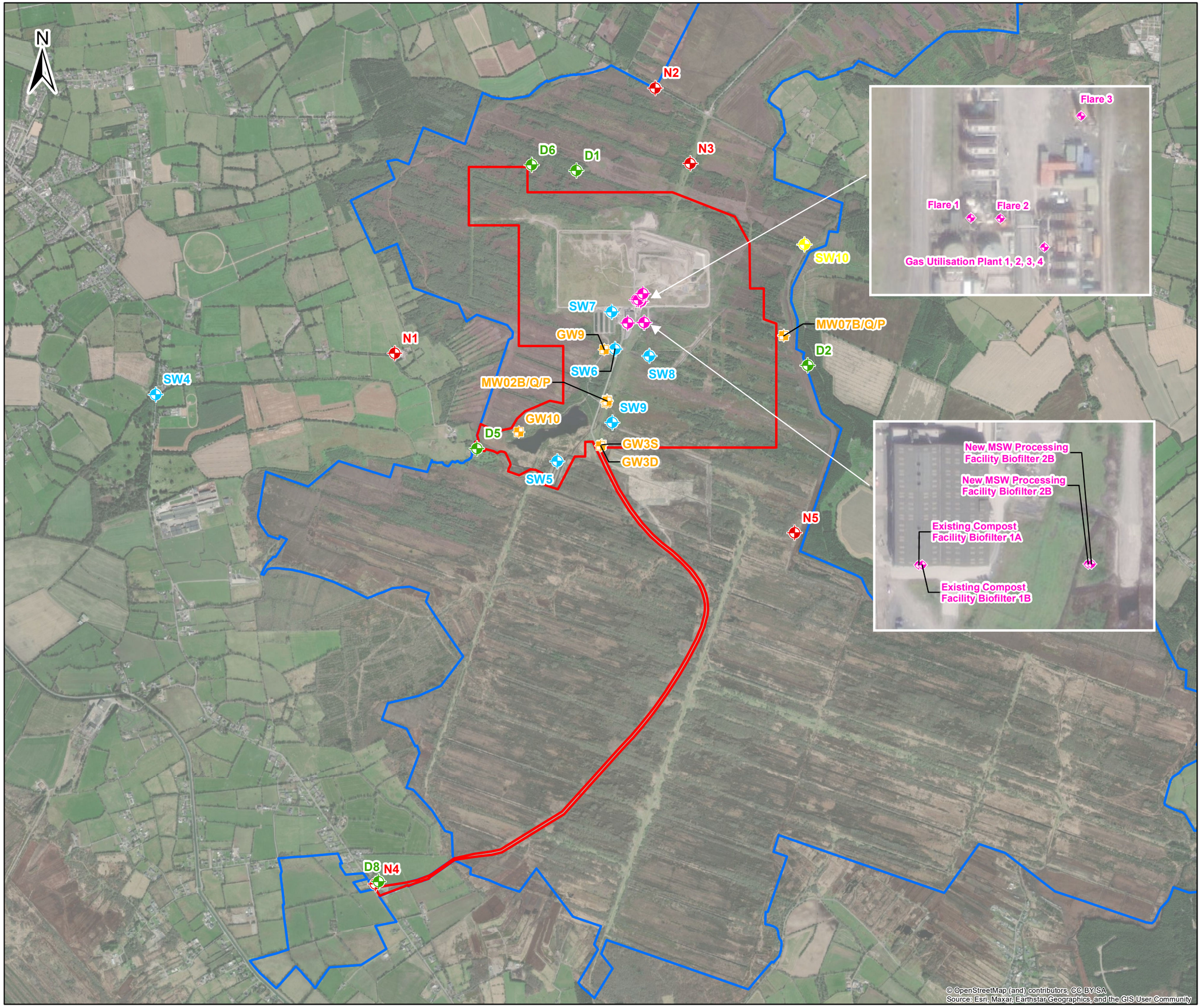
The following sections describe the monitoring programmes that will be established as part of the proposed development. It should be noted that the measures outlined below are already carried out at the existing facility. These monitoring measures are set out in accordance with the EPA's *Landfill Manuals: Landfill Monitoring (2nd Edition)* (2003) publication. Specific monitoring will also be required during the construction phase of the proposed development and these requirements are also addressed.

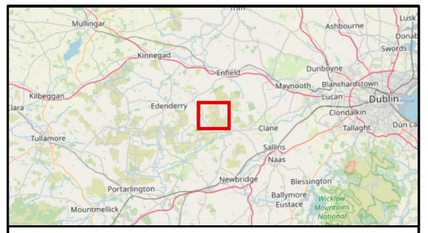
All environmental monitoring will be carried out in accordance with the requirements of Conditions set out in a revised IE Licence to be issued by the EPA for the facility. In a number of cases, Emission Limit Values (ELV) will be set in the IE Licence for emissions to the environment and any exceedance of these values if considered a non-compliance with the IE Licence.

The primary aim of the monitoring measures set out below is to comply with legislation, the requirements of the IE Licence, to monitor the quality of the environment in the vicinity of the site and identify any potential adverse effects from the proposed development on the environment.

As part of a revised IE Licence, it is anticipated that an Annual Environmental Report (AER) will be required which will collate and report all monitoring data each year. The AER is typically required to be submitted to the Agency by the end of March on an annual basis. In addition, regular monitoring reports will be provided to the EPA throughout the year at frequencies as set out in the IE Licence Schedules. These reports, as well as the AERs, are typically made publicly available on the EPA website and will present trended data over the lifetime of the facility including data collected from the existing facility.

It should be noted that the monitoring programme requirements as outlined below may be altered by Conditions set out by the EPA in the IE Licence, but it is expected that it will be largely similar to that outlined herein. The proposed locations for environmental monitoring are set out in Figure 2-6.





Legend

- Application Boundary
- Ownership Boundary
- Surface Water Monitoring Location
- Surface Water Monitoring Location (Construction Phase Only)
- Dust Monitoring Locations
- Noise Monitoring Locations
- Air Emission Locations
- Groundwater Monitoring Locations

0 250 500 750 1,000
Metres

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

Issue	Date	Description	By	Chkd.
A	25/05/2023	Final issue	S.P	R.H

Client: Bord na Móna

Project: Drehid Waste Management Facility Further Development

Title: Proposed Environmental Monitoring Locations

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

Project Director: D.Grehan

TOBIN CONSULTING ENGINEERS
Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax:+353-(0)1-8030409
e-mail: info@tobin.ie
www.tobin.ie

Figure 2-6

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2.2.11.1 Dust Monitoring

Dust will be monitored using Bergerhoff gauges, as specified in the German Engineering Institute VDI 2119 document *Measurement of Dustfall Using the Bergerhoff Instrument (Standard Method).* It is proposed that gauges will be installed around the proposed development at the locations as shown in Figure 2-6. The dust monitoring point co-ordinates are presented in Table 2-7.

Table 2-7 – Proposed dust monitoring locations

Reference No.	Co-Ordinates (ING)
D1	E274196, 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/m^2/day, based on 28 to 32-day composite samples averaged over a year as per the above referred methodology. During the active lifetime of the landfill, dust monitoring will take place at least monthly and is proposed to be reduced after cessation of waste placement as waste activities will be significantly reduced.

At least one month prior to the commencement of construction of the proposed development, dust gauges will be installed at the five locations outlined in Table 2-7 and the baseline rate of dust generation prior to construction recorded. Dust monitoring will be undertaken on a monthly basis during construction activities.

In addition to the above, the site and adjoining roads will be inspected on a daily basis for evidence of excessive generation of airborne dust. This inspection will be carried out firstly by Bord na Móna personnel and will also be a Contractual requirement imposed on the Contractors during construction activities.

Any remedial actions arising from the inspections will be implemented immediately through housekeeping, road sweeping or damping down surfaces as appropriate. Mitigation measures to minimise dust generation are discussed in Chapter 12 (Air Quality & Climate).

2.2.11.2 Air Quality Monitoring

There will be emissions to air from the new combined MSW Processing and Composting Facility associated with the odour abatement systems. Currently, emissions to air from the existing compost plant are via roof mounted stacks on top of the building. A new acid scrubber and biofiltration system is proposed as part of the development to account for treating odours associated with the increased waste intake of 65,000 TPA at the combined facility which will have four new emission stacks extending up from the structures which will house the odour abatement system. Details on these new stacks and their locations are presented in the odour impact assessment in Chapter 12. Figure 2-6 shows the indicative location of the air emissions from the MSW Processing and Composting Facility, as well as from the LGUP and flares.

Monitoring of the emissions to air will be in accordance with the conditions of the revised IE Licence for the facility. It is proposed to monitor emissions to air from the biofilters for ammonia,

hydrogen sulphide and mercaptans using colorimetric indicator (Drager) tubes on a biannual basis. This will be agreed with the EPA as part of the licensing process.

Landfill gases will be generated in the new landfill due to the presence of biodegradable material. A landfill gas collection system will be installed within the waste body to collect and divert gas from the landfill to the existing landfill gas management compound. Landfill gas here will either be consumed by the utilisation plant to generate electricity or, where the combustion plant is unavailable, or the landfill gas is unsuitable (i.e. too sour), landfill gas will be flared as per standard practice at landfill facilities.

It is proposed to monitor the following emissions to air from the combustion plant and flares:

- carbon monoxide (CO) (continually);
- nitrogen oxides (NO_x) (biannually);
- sulphur dioxide (SO_2) (biannually); and
- particulates (utilisation plant only) (annually).

2.2.11.3 Odour Monitoring

Daily monitoring for odours will be carried out by site personnel and recorded in a site log. Any odours observed and reported by members of the public off-site will also be recorded. The occurrence and location of odours detected will be compared with current weather conditions in terms of wind direction and temperature. This information will help to identify the sources of odour and allow for full investigations to be carried out. Any remedial actions required will be carried out immediately.

Control measures, such as the proposed odour abatement system and use of daily landfill cover, will minimise potentially nuisance causing odour emissions.

2.2.11.4 Noise Monitoring

During the operational phase of the proposed development, noise monitoring will be carried out on an annual basis as per current arrangements. The noise survey will be undertaken in accordance with the methodology specified in the *Guidance note for Noise Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) 2016* published by the EPA. Noise limits will be set in accordance with this guidance and is discussed in detail in the noise impact assessment in Chapter 10. These limits will be specified in the revised IE Licence.

There are five proposed locations for noise monitoring which are shown on Figure 2-6 and listed in Table 2-8. These locations are currently used for annual noise monitoring in accordance with existing IE Licence requirements.

Table 2-8 – Proposed noise monitoring locations

Reference No.	Co-Ordinates (ING)
N1	E273059 N231480
N2	E274690 N233140
N3	E274909 N232667
N4	E272939 N228160
N5	E275563 N230357

Vibration monitoring is not proposed given the significant distance between the site and the closest sensitive receptor and absence of sensitive structures in proximity to the site.

Noise monitoring will be undertaken by suitably qualified persons and in accordance with EPA and IE Licence requirements. Noise monitoring results will be reported to the Agency and in the AER as required. Further information on potential for noise impacts is discussed in Chapter 10.

2.2.11.5 Surface Water Monitoring

Surface water quality will be monitored at the proposed development during all phases of the project, i.e. construction, operation and decommissioning. A number of surface water drainage channels originate within the property boundary.

All surface water sampling will be carried out by trained personnel from Bord na Móna or by suitably qualified consultants. All analyses, except for on-site readings, will be carried out off-site by an accredited laboratory. A visual inspection of surface water discharges from the proposed development will be carried out by site personnel on a daily basis.

Proposed surface monitoring locations are shown on Figure 2-6 and their locations are listed in Table 2-9. These locations represent discharge from the existing settlement pond prior to discharge into the Cushaling River (SW5) and the outfall from the existing ICW associated with the existing stormwater drainage network (SW6). SW4 is an existing monitoring point on the Cushaling River downstream of the site at Dillon's Bridge. Two new monitoring locations will be established at the outfall from the new ICW (SW9) and the outflow to the Mulgeeth Stream (SW10).

Table 2-9 – Proposed surface water monitoring locations

Reference No.	Co-Ordinates (ING)
SW4	E271564 N231222
SW5	E274076 N230805
SW6	E274439 N231508
SW9	E274422 N231047
SW10	E275626 N232162

Discussion on frequency and parameters to be monitored at the above locations are set out in Chapter 8 (Water).

Monitoring instrumentation will be linked into the existing SCADA system in place at the facility. An actuated valve at the surface water lagoon outlets will be controlled by the SCADA system. This valve will be programmed to close should any of the defined parameters fall outside permitted levels. The volume of surface water discharged to the surrounding environment will also be controlled through the same actuated valve and SCADA system.

Data will be collated, tabulated and reported including interpretation and comparison with the previous year's data. This information will be presented in the AER, which will be submitted to the EPA.

2.2.11.6 Groundwater Monitoring

Extensive site investigation works have been carried out at the location of the proposed development as detailed in Chapters 7 and 8. Existing wells will be monitored during construction works to determine the influence of any dewatering required for construction of the new landfill. All groundwater monitoring will be carried out by trained personnel in accordance with best practice sampling procedures [7]. Samples will be collected and sent off-site to accredited laboratories for analysis.

Proposed groundwater monitoring locations are shown on Figure 2-6 and their locations are listed in Table 2-10. The monitoring locations include both upstream and downstream locations.

Table 2-10 – Proposed groundwater monitoring locations

Reference No.	Co-Ordinates (ING)
GW-9	E274371 N231504
GW-10	E273836 N230987
GW-3S	E274354 N230907
GW-3D	E274349 N230902
MW02B	E274384 N231172
MW02P	E274388 N231186
MW02Q	E274389 N231180
MW07B	E275496 N231589
MW07P	E275496 N231592
MW07Q	E275496 N231590

Discussion on frequency and parameters to be monitored at the above locations are set out in Chapter 7 (Soils, Geology and Hydrogeology).

Groundwater monitoring results will be reported to the EPA and comparison with previous years presented to identify and trends.

2.2.11.7 Ecological Monitoring

Chapter 6 sets out the proposed biological monitoring proposals for surface water.

In addition, monitoring will be carried out to determine the effectiveness of measures to protect butterflies as set out in the *Lepidoptera Management and Enhancement Plan* which is included in Appendix 6.2.

Monitoring of the ICW vegetation will be carried out as detailed in Appendix 2-4 to ensure the ponds are operating to the optimum efficiency.

2.2.11.8 Meteorological Monitoring

There is an existing meteorological station installed on-site at the Drehid WMF. This station has capacity to record precipitation volume, wind force, wind direction, evapotranspiration,

[7] BS ISO 5667-11:2009 – Water quality. Sampling - Part 11: Guidance on Sampling of groundwaters and EPA, *Landfill Manuals: Landfill Monitoring* (2003)

temperature and barometric pressure on-site. These records are useful in reviewing odour complaints and for reporting on environmental monitoring as set out in the previous sections.

2.2.12 Employee Welfare

New facilities are included as part of the proposed development to cater for the health, safety and welfare of people that will be employed in the proposed development. As part of the proposed development there is specific welfare facilities included for the sanitary, hygiene and comfort requirements of personnel. These are located within the new maintenance building. Considerations with respect to noise and air quality are detailed hereunder.

Noise at Work

Noise levels within the MSW Processing and Composting building as well as the Soils Processing Building have the potential to exceed the noise action levels contained with the *Safety, Health and Welfare at Work (General Application) Regulations 2007* depending on the level of activity occurring and the duration of time operatives are working in certain areas.

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

For those areas where the Lower Action Level is exceeded, the Applicant will:

- 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;
- preventative audiometric testing shall be made 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 is exceeded, the Applicant will:

- 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 addition to the above and in all instances the employees have the following obligations:

- using the hearing protectors provided;
- using any other protective measures provided;
- reporting 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.

The use of hearing protection will be provided within the MSW Processing and Composting Building and Soils Processing Building and provided to all staff working in this area as per current arrangements. A noise at work survey will be undertaken during the operational phase of the development to determine the specific noise levels in these buildings and to identify specific noise control and management measures to be implemented on site.

Air Quality

Chapter 11 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 *2016 Code of Practice for the Chemical Agents Regulations.* 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 15-minute average (the short-term exposure limit (STEL) based on 15-minute periods, 4 times per day). HSA guidelines for safe working and PPE use will be implemented on site at all times.

During the construction period, the Dust Minimisation Plan (DMP), included in Appendix 12.3, will be provided to the Contractor and implemented to minimise dust emissions. This will reduce effects both from a dust soiling and human health point of view.

During the operational phase, maintenance of all equipment and systems in place for control of emissions will be carried out to ensure emission concentrations are minimised. This includes control and monitoring in accordance with IE Licence requirements and to manufacturer requirements.

2.2.13 Contingency Arrangements

2.2.13.1 Contingency Plan for Site Emergencies

Any accidents and other emergencies will be handled by on-site personnel in accordance with Bord na Móna emergency response procedures. Emergency response contact numbers for the relevant authorities including the Fire Service, Gardaí, and Ambulance Services will be prominently posted on-site. All site operatives and other relevant employees of Bord na Móna will be regularly trained in emergency response procedures and in fire prevention and control.

Site safety procedures will be adopted to protect any persons from injury on-site. Should injury occur, the trained site operatives, where appropriate, will be the first to administer assistance. Emergency and first-aid materials will be available in the existing and proposed site buildings. Emergency and first-aid procedures will also be prominently displayed in the site buildings, and adjacent to the surface water lagoons.

1. An updated Emergency Response Plan will be prepared and maintained at the proposed development. The Plan, which will be based on the Emergency Response Plan for the existing facility, will detail any emergency situation which could occur on site and the proposed response should this emergency occur. A copy of the existing Emergency Response Procedures which make up the Emergency Response Plan are included in Appendix 2-8, and these will be updated in accordance with the proposed development as part of the IE Licence Review. The updated Emergency Response Plan will detail procedures for the following occurrences:

   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 Response Plan will be implemented. Each procedure details the

emergency situation, the proposed response should this emergency occur and the potential environmental impacts of this occurrence.

3. The Facility Manager shall assume the role of Site Incident Controller, with responsibility for:
   - assessing the scale of the incident;
   - informing emergency services; and
   - 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 shall be contacted immediately via the two-way radio system. The weighbridge radio shall act as the main point of contact for the Facility Manager.
5. Following an emergency, the Facility Manager (or in his absence the designated Environmental Officer) shall record the details of the incident. An Environmental Incident Investigation and Reporting Form (EPF 8.1) shall be completed which is located within the procedure for Environmental Incident Investigation and Reporting (EMS Environmental Procedure EP 8.0). Following the environmental incident, appropriate procedures shall be implemented, i.e., Environmental Non-Conformance Procedure (EP 9.0) and Environmental Corrective and Preventative Action Procedure (EP 10.0).
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 shall 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 shall notify the Local Authorities and the IFI as soon as practicable after the incident.
9. On a weekly basis, all emergency response equipment shall be checked to ensure it is provided in agreed quantities and in suitable working order. The dust suppression water bowser shall be checked on a daily basis to ensure that it is full of water.
10. In the case that an emergency situation arises outside the hours of operation, the security person shall immediately contact the designated person on call.

2.2.13.2 Contingency Plans for any Breakdowns On-Site

The regular maintenance of all plant and equipment utilised on-site will be undertaken in accordance with the manufacturer's guidelines. This maintenance programme will help to minimise occurrences of breakdowns on-site. In the event of any breakdown, the item of plant or equipment will be promptly repaired or replaced. A new maintenance building is proposed to facilitate this maintenance programme. All plant and equipment will be checked on a daily basis.

2.2.13.3 Contingency Plans in Respect of Absentee Staff

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

2.2.13.4 Contingency Procedures outside Normal Operating Hours

Site personnel and other employees of Bord na Móna will be available in the event of any emergency at the site outside of normal working hours. An emergency contact number will be prominently posted at the existing entrance at the R403 Regional Road.

Local emergency services will be informed of contact numbers for key Bord na Móna personnel. Outside normal working hours, security personnel will also be provided at the site who will also have the relevant contact numbers. These security arrangements will be implemented in order to guard against unlawful trespass and vandalism. Basic routines will exist whereby any cash, records and equipment will either be taken off-site daily or secured within the administration building. These procedures will be in the interest of overall security.

2.2.13.5 Contingency Plans in the Event of Environmental Contamination

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

The discharge from the surface water lagoons through the ICWs to the existing bog drains and eventually the Cushaling River will be monitored continuously in respect of electrical conductivity, dissolved oxygen and flow rate. In the unlikely event that deterioration in the surface water quality being discharged is detected, an automated isolating valve will close. This isolating valve will allow for the retention of all surface water on-site until the contamination event is investigated and remediated. This protection measure will be in place throughout the construction, operation and decommissioning phases.

2.3 DETAILS OF ADDITIONAL LANDFILL CAPACITY

2.3.1 Phasing of the Landfill

The proposed landfill infrastructure, as outlined on Drawing No. 11290-2003 and 11290-2010 of Appendix 2-1 will cover and area of approximately 35 ha. The landfill is designed to be constructed in 12 no. Phases, which are numbered from Phase 16 to Phase 28 to maintain consistency with the existing infrastructure on site and ease of reference for operational staff.

Stripping of the peat layer and preparation of the ground to the formation levels required will take place prior to the development of each phase. Peat stripping will be overseen by an archaeologist as discussed in Chapter 13. The phasing of the development of the landfill and proposed formation levels (base of excavation) of the footprint are shown on Drawing No. 11290-2011 of Appendix 2-1.

Prior to the construction of the landfill, all vegetation will be cleared, and the ground will be stripped of peat and soils. The floor of the landfill will be graded in accordance with the required formation levels as shown on Drawing No. 11290-2011 of Appendix 2-1. Construction programme, methodology and the protection of water quality during these activities are discussed in Section 2.7.

After deposition of waste, the final capping will be installed, and full restoration will take place. Following reprofiling, the final capping system, as detailed in Drawing No. 11290-2063 of Appendix 2-1, consisting of a gas collection layer, a low permeability barrier layer, a linear low-density polyethylene (LLDPE) liner and woven geotextile, a drainage layer, subsoil and topsoil, is placed. The maximum height of the fully completed capped new landfill will be approx. 115.75 m AOD. The proposed final contours for the landfill are shown on Drawing No. 11290-2070 of

Appendix 2-1. Following final capping each phase will be allowed to recolonise with natural species as described in Section 2.2.9.

The basal liner for each phase will be constructed in conjunction with the deposition of waste into previous phases which will allow for consistent and efficient placement of waste without any lack of capacity arising. Table 2-11 provides estimated dates for the commencement of waste deposition, temporary capping, and final capping in each of the phases of the proposed new landfill. The actual start date for construction and the placement of waste in the new landfill will be dependent on the timing of the issuing of a grant of planning permission and new IE Licence., and on the rate of landfilling over the lifetime of the facility.

The new landfill will also be continually landscaped utilising a combination of slope embankments and planting in order to minimise any visual effects. As outlined above, on placement of temporary capping, each phase will be seeded with grass which will help to minimise any visual effect at the site.

On the final capping of the landfill, the site will be allowed to re-colonise with natural species. Details of the landscaping measures for the site are outlined in more detail in the landscape and visual impact assessment in Chapter 11. Contouring of the cap will also be completed to allow clean surface water run-off from the top of the landfill, thereby preventing ponding and minimising the risk of infiltration into the waste body.

Table 2-11 – Indicative duration of waste placement in new landfill

Phase	Filling Duration (months)	Start of Waste Filling	End of Waste Filling	Completion of Final Capping
Phase 16	26	2026 Q1	2028 Q1	2031
Phase 17	26	2028 Q1	2030 Q1	2033
Phase 18	26	2030 Q1	2032 Q1	2035
Phase 19	26	2032 Q1	2034 Q1	2037
Phase 20	26	2034 Q1	2036 Q1	2039
Phase 21	26	2036 Q1	2038 Q1	2041
Phase 22	26	2038 Q1	2040 Q1	2043
Phase 23	26	2040 Q1	2042 Q1	2045
Phase 24	26	2042 Q1	2044 Q1	2047
Phase 25	26	2044 Q1	2046 Q1	2049
Phase 26	26	2046 Q1	2048 Q1	2051
Phase 27	26	2048 Q1	2050 Q1	2053

2.3.2 Basal Lining System

2.3.2.1 Design of Basal Liner

As outlined previously, the new landfill will be constructed in 12 no. Phases with each phase encompassing an engineered basal liner consisting of a high-density polyethylene (HDPE) liner overlaying a Bentonite Enhanced Soil (BES) layer. Lined cells will be constructed in accordance with the *EU Landfill Directive (1999/31/EC)* and the *EPA Landfill Design Manual* (2000),

allowing for the isolation of the deposited waste at the site. This is as per the current landfill infrastructure installed at the site and in compliance with EPA Guidance.

Landfill cells will be constructed on areas cleared of vegetation and peat, either cut or filled, to align with the topography, to the formation levels shown on Drawing No. 11290-2011 of Appendix 2-1. The basal lining system is designed to contain leachate generated from waste placed above the liner which will be at its maximum prior to final capping. Upon final capping, the capping layer will significantly reduce rainfall infiltration into the waste body and the generation of leachate associated with same.

The basal lining system constructed at the site consists of a number of different layers as detailed in Drawing No. 11290-2060 of Appendix 2-1. The basal lining system, from top to bottom, is as follows:

- Leachate drainage layer (minimum thickness of 500 mm) with a hydraulic conductivity of greater than $1x10^{-3}$ m/s. A HDPE drainage pipe network is imbedded in the drainage layer to collect the leachate and drain it to a leachate collection sump. The pipework 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/m^2) or similar with a high CBR puncture resistance lain underneath the drainage layer;
- Barrier layer consisting of HDPE geomembrane liner with a thickness of 2 mm. A 2 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% and is installed as smooth material on the landfill floor and textured material on the side slopes;
- 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 thickness. 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;
- Separation layer consisting of a geotextile material (>125g/m^2) or similar;
- 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. The underlying geology is described in Chapter 7 (Soils, Geology and Hydrogeology).

2.3.2.2 Installation of Basal Liner

The appointed Contractor will prepare a construction stage method statement for the installation of the basal liner. This will be carried out during the detailed design stage and will be required to be in compliance with industry best practice set out in the *EPA Landfill Site Design Manual*. Landfill development works are required to be approved by the EPA prior to commencement and upon completion prior to placement of waste. An agreed methodology for construction of the basal liner has been agreed with the EPA for the existing facility and will be implemented for the proposed development works. A copy of the method statement for installation of the BES liner which was implemented for the most recent landfill phase construction at the Drehid WMF is included in Appendix 2-9.

Figure 2-7 shows the BES liner installation at the existing Drehid WMF.

Figure 2-7 – BES liner installed at Drehid WMF

2.3.2.3 Landfill Liner Quality Control

The HDPE liner manufacturer and specialist supplier will have a specific quality control and quality assurance policy in operation that covers all aspects of the manufacture, supply and installation of their HDPE liner systems. At the manufacturing 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 a range of industry standards, such as BS, ISO, ASTM, DIN. These standards are referred to and set out in the EPA *Landfill Site Design Manual.*

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

- Technical consultation prior to commencement of the work to familiarise the specialist 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;
- Supply to site of pre-cut panels for the liner to sizes determined by the Contractor and agreed with the Engineer complete with interlocks welded on, and sealing tubes;
- Provision of one or more welding technicians on site to cut and weld panels to dimensions determined by the Contractor on a day-to-day basis. These personnel also carry out any modifications or repairs that may be required during installation; and
- If requested, the liner manufacturer provides an engineer on site during installation to give advice relating directly to their products.

2.3.2.4 Landfill Liner Quality Assurance

CQA will be carried out in accordance with the procedures set out above. A comprehensive CQA Plan will be prepared by the liner installer during installation to maintain the integrity of all aspects of their quality control, testing and installation regime. An experienced and fully qualified employee of the lining supplier will be responsible for QA. 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 Engineer.

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 allowed 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 will also be carried out. This survey is part of the CQA programme. A mobile survey is performed after the drainage stone is fully placed within the cell. Figure 2-8 shows a leak detection survey underway at the existing Drehid WMF.

Figure 2-8 – Leak detection test in progress at existing Drehid WMF

2.3.2.5 Landfill Liner Materials Balance

The estimated material quantities required for construction of the new landfill are set out in Table 2-12 and are taken from the design drawings and 3D model of the proposed landfill. This table includes the materials required for construction of the landfill capping which will be completed following cessation of waste placement in each Phase.

Table 2-12 – Estimated material quantities for construction of new landfill

Item	Material	Quantity	Source
Material for landfill embankment construction	Compacted suitable subsoil materials	138,333 m^3	Won on-site
Low permeability basal layer (BES)	Bentonite clay (c. 5% of overall BES quantity)	8,353 m^3	Import
	Host soil/sand (c. 95% of overall BES quantity)	158,702 m^3	Import
Basal liner geomembrane	Flexible HDPE geomembrane (2.0 mm)	339,905 m^2	Import
Basal liner separation geotextile	Geotextile (>125g/m^2) or similar	339,905 m^2	Import
Basal liner protection geotextile	Woven geotextile (>750 g/m^2) or similar	339,905 m^2	Import
Drainage layer	16-32 mm stone aggregate or similar	152,740 m^3	Import

Item	Material	Quantity	Source
Daily cover	C&D fines, low permeability soils and biostabilised material or similar	136,242 m^3	Import & Won On-Site NOTE 1
Temporary/ Intermediate cover	C&D fines, low permeability soils and biostabilised material or similar	136,242 m^3	Import & Won On-Site NOTE 1
Landfill gas collection	Geosynthetic gas drainage such as EnkaDrain or similar	340,606 m^2	Import
Capping liner geomembrane	Flexible LLDPE geomembrane liner (1.5 mm) or similar	340,606 m^2	Import
Capping liner protection geotextile	Woven geotextile (>750 g/m^2) or similar	340,606 m^2	Import
Capping drainage	Geosynthetic water drainage such as EnkaDrain or similar	340,606 m^2	Import
Capping subsoil	Suitable subsoil material (850 mm)	289,515 m^3	Won on-site
Capping topsoil	Suitable topsoil material (150 mm)	51,091 m^3	Import & Won On-Site NOTE 2

NOTE 1 Biostabilised fines may be supplied from the compost plant facility outputs as per Section 2.2.4 or imported from external sources.

NOTE 2 Inert waste which is suitable for recovery in the capping topsoil maybe be imported to the facility.

Two material borrow areas have been permitted at the Drehid WMF which can be used as a source of construction and restoration material over the lifetime of the Drehid WMF.

A clay borrow area located to the north-west of the existing landfill footprint can be used as required as a source of material for embankment construction, daily cover, temporary cover and low permeability material required for final capping works. Every attempt will be made to use material generated during the stripping and clearing of ground for embankment construction such that use of material from the borrow pit is not required or minimised. This approach has proved successful during the construction of the existing facility to date. It is estimated that approximately 480,000 m^3 of suitable soils will be required for embankment and capping works throughout the lifetime of the facility (daily and intermediate cover is excluded as this material will primarily be sourced from C&D fines and biostabilised waste). The sourcing of as much suitable soils/clay material on-site as possible will avoid the need for importing such material to the site and accordingly will reduce the number of traffic movements on the public road over the lifetime of the facility.

Sand or other suitable host material is required for the BES layer and aggregates are required for leachate drainage and sub-base for the road construction. These engineering materials will be imported to the site. Raw bentonite clay for producing BES, all geomembrane liners, geosynthetic drainage material and geotextile products will be imported to site. The quantities of material imported to the site for construction of the basal liner will be phased over the long-term development of the 12 no. Phases of the landfill. Table 2-11 gives an indicative schedule for construction of each phase.

An estimated 1,025,743 m^3 (including approx. 277,888 m^3 peat) of material will be generated from the excavation of the landfill footprint to achieve the required formation levels. This

material will be retained on site and used for the construction of perimeter screening embankments, landfill embankments and as subsoil/topsoil in the final capping.

2.3.3 Leachate Collection System

A herringbone leachate collection system will be constructed within the drainage layer on top of the HDPE liner. Leachate collected in this pipework is drained to a collection sump from where the leachate is pumped out of the waste body via side slope risers as shown on Drawing No. 11290-2012 and detailed on Drawing No. 11290-2060 of Appendix 2-1. The leachate is then pumped to the raw leachate storage tanks located in a bunded area adjacent to the landfill gas management compound. This area is located adjacent to the completed Phase 9 of the existing landfill.

Leachate can be pumped independently from each of the leachate collection sumps and the quantity of leachate pumped as well as the depth of leachate in the cell are monitored automatically at the leachate headwall. This allows for more flexibility with respect to the management of the leachate on-site, particularly during the active life of the site.

It is also intended, as is currently carried out at the existing landfill, that provision will be made for the recirculation of leachate collected in the leachate tanks back into the waste body. This recirculation process can promote the generation of leachate gas and encourage degradation of the waste within the landfill. The suitability of the waste for recirculating leachate will depend on the composition of the waste and will be determined by the operations time over the lifetime of the facility. Any leachate recirculation proposals will also be discussed with the EPA in advance. It should be noted that the quantities of leachate presented in Table 2-16 do not take recirculation into account and the traffic movements assessed in Chapter 14 assume all leachate is removed from the site without recirculation.

The leachate collection system is also designed in such a manner that, following the closure of the landfill and when the leachate levels in the landfill decrease significantly, it will be possible to pump leachate directly from the collection sumps in the waste body to awaiting tankers for removal off-site. This will facilitate the decommissioning of the leachate storage tanks and recirculation equipment, where installed, where leachate generation levels have reduced significantly.

The leachate collection system has the following key properties as defined in the EPA *Landfill Site Design Manual*:

- Leachate drainage layer (minimum thickness of 500 mm) with a hydraulic conductivity of greater than $1x10^{-3}$ m/s. A HDPE drainage pipe network is imbedded in the drainage layer to collect the leachate and drain it to a leachate collection sump. The pipework is surrounded by gravel material (e.g. Clause 505B or equivalent) or similar approved drainage material. 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; and
- A protective geotextile is placed below the leachate drainage layer and HDPE collection pipework to protect the underlying HDPE liner. This geotextile will have a high CBR puncture resistance and the exact specification will be confirmed by cylinder test. The cylinder test will be performed using the specific leachate drainage stone and a sample of the geotextile and HDPE liner.

The head of leachate in the waste body is maintained below a level of 1 m in height at all times to prevent excess build-up. A leachate level sensor is installed on the side slope riser and will detect the leachate level on a continuous basis. The level sensor activates the leachate pump at

a predetermined level and alarm warnings are triggered where the leachate level exceeds a set depth.

The SCADA network in place at the facility will be connected to the leachate level sensors to monitor the depth of leachate in the cells on a continuous basis and can be remotely viewed by the operational staff at any time. The SCADA controls also ensure that leachate is only pumped to the leachate storage tanks when there is sufficient capacity in the tanks. If this capacity is not available for any reason, then the leachate pumps can be deactivated, or leachate can be recirculated where the equipment is in place. Level sensors in the leachate storage tanks are also connected to the SCADA network such that leachate is tankered off-site (refer to Section 2.2.5) on a regular basis to avoid the likelihood of a lack of capacity in the storage tanks.

The SCADA network will be extended to incorporate the new landfill infrastructure.

2.3.4 Landfill Gas Collection System

Landfill gas will be generated from the biodegradation of waste placed within the landfill. A landfill gas collection system will be installed to safely collect and divert this gas from the new landfill to the existing landfill gas management compound. Vertical gas collection wells are installed as waste is placed in the landfill and are surrounded with suitable material to promote permeation of gas into the wells. Crushed glass is typically used for this purpose and the use of waste glass instead of non-waste materials means that the glass is recovered in the landfill, as opposed to disposed of. An average depth of 1 m of crushed glass, or other similar material, is applied around the wells. The vertical wells are then connected to horizontal collector drains which take the gas out of the waste body and above the landfill capping. Drawing No. 11290-2013 of Appendix 2-1 shows an indicative arrangement of landfill gas extraction wells. In some cases, additional vertical wells are drilled into the waste body following placement of the temporary capping to improve collection.

Details of the landfill gas extraction wells are shown on Drawing No. 11290-2063 of Appendix 2-1 and consist of:

- A vertical shaft with diameters of 0.5-1.0 m – the diameter depends on utilisation of grabbing or drilling technique and on the depth of the landfill body above the basal liner;
- A vertical, perforated (slotted) HDPE pipe with diameter of 160-200 mm and length depending on position and depth of landfill;
- Surrounding crushed glass or gravel typically 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 with diameter of 125-160 mm and length 2-3 m;
- Wellhead with monitoring facilities and regulator valve; and
- Bentonite sealing layer.

A landfill gas ring main pipeline will connect the gas wells to the existing landfill gas treatment plant in the landfill gas compound. This ring main will consist of 355 mm diameter HDPE surrounding the landfill footprint. The ring main will be extended on construction of each phase until the landfill is fully constructed. Landfill gas can be saturated with water vapour, therefore when landfill gas is extracted, some condensation of water will occur as a result of the temperature decrease between the waste body and the pipework outside the waste body. In order to prevent the pipelines from filling with water, the gas ring main pipeline must be laid to falls. At regular low point intervals, special condensate traps (referred to as knock-out pots) will

be installed to collect condensate from the pipeline and allow for its removal using a pump. A typical landfill gas condensate trap is shown on Drawing No. 11290-2063 of Appendix 2-1.

As part of the proposed works, all of the pipework on the gas collection system will be pressure tested to confirm their integrity. All valves and other fittings will also be tested to ensure that they are leak tight.

The gas collection infrastructure from the new landfill will be connected into the existing landfill gas treatment infrastructure in the compound adjacent to Phase 9 of the existing landfill. In the initial stages of the existing landfill, landfill gas was directed to a series of flares which burned the gas to break down the methane. In late 2013, Bord na Móna opened a 5 MW LGUP at the facility to consume the methane-rich landfill gas in combustion engines to generate electricity.

Currently, the electricity generation capacity of the LGUP 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 LGUP, in the landfill, compost facility and service buildings. These facilities are now primarily powered by electricity generated on the site. Landfill gas generated in the new landfill will also be connected to the LGUP to generate electricity, in the first instance for use at the facility as a renewable energy source and to minimise mains electricity consumption.

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

Excess or unsuitable landfill gas (referred to as sour gas) which cannot be utilised in the combustion plant is flared off as per standard practice at such installations. An upgraded landfill gas flare was installed at the facility in 2021/2022 to ensure optimum treatment of waste gas. Landfill gas generated from the proposed development will be collected, diverted and treated in an identical manner to the current arrangement.

2.4 LEACHATE GENERATION AND MANAGEMENT

Leachate generated in a landfill is a liquid which is 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 to prevent any uncontrolled release of leachate to the ground which could result in environmental damage. Measures are necessary to minimise leachate generation and to collect and remove it in an environmentally safe manner. The leachate level in the landfill will be controlled primarily by the leachate collection pipework and removal system described in Section 2.3.3, which allows leachate to be pumped from within the lined landfill to storage tanks.

For the proposed landfill, a herringbone leachate collection system will be constructed on top of the basal liner as described previously. Collected leachate will drain to collection sumps, from where it will be pumped to raw leachate storage tanks located in the existing storage compound. From here the leachate will be collected on a daily basis and removed off-site in road tankers to a waste facility or WWTP as discussed in Section 2.2.5.

2.4.1 Leachate Quantity

Leachate generated in the landfill is a potential source of contamination for ground, surface water and groundwater receptors at and surrounding the landfill site. It is difficult to establish

accurate estimates of leachate generation as there are a range of factors which affect the production of leachate, such as waste type, precipitation rates, evaporation rates and extent of daily/intermediate/final capping. An approach to estimate future leachate generation rates is to use a water balance model as set out in the EPA *Landfill Site Design Manual*. Operational generation rates and post-closure generation rates will differ, and both are required to be estimated. Leachate generation will significantly reduce post completion of the final capping as only small quantities of rainfall will infiltrate into the waste body. In addition, the emergence of vegetation on the landfill cap will absorb rainfall and further reduce quantities.

For the efficient operation of a landfill facility, it is essential to maximise the separation of areas which have potential to generate leachate from 'clean' water. For this reason, each phase of the landfill is separated into discrete cells which ensure that any rainfall falling on newly constructed areas of the landfill can be handled as 'clean' water prior to waste placement in the cell. Separation of leachate and clean water is the key philosophy in designing a water management system at a landfill site.

The active working/tipping area for the landfill will be kept to the minimum area required to facilitate the safe and efficient offloading and compacting of waste. At the Drehid WMF, haulage trucks are provided with access onto the active tipping face to avoid the need for double handling of incoming waste into dumper trucks, as can be the case in other similar landfills. It is proposed, as per the current methodology which has been agreed with the EPA, that an active working area of approx. 40 m X 40 m will be used to allow for large compactors and bulldozers to operate safely and compact waste in c. 3 m high lifts. Maintenance of this working area will keep leachate generation to a minimum in accordance with best practice.

For the purpose of estimating future leachate quantities, the following equation as set out in the EPA *Landfill Site Design Manual* is used:

$$L_0 = [ER(A) + LW + IRCA + ER(l)] - [aW]$$

Where:

L_0 = leachate produced (m^3)
ER = effective rainfall (actual rainfall (R) used for active cells) (m)
A = area of cell (m^2)
LW = liquid waste (m^3) (note: this is not applicable at the existing or proposed development)
IRCA = infiltration through restored and capped areas (m)
l = surface area of lagoons (m^2) (note: this is not relevant at existing or proposed development as lagoons are for clean surface water only)
a = absorptive capacity of waste (m^3/t)
W = weight of waste deposited (t/a)

As described in Section 2.3.1, the new landfill will be developed progressively across the 12 no. Phases over the 25-year lifetime. Once each phase has been filled with waste, the surface of the waste will be capped with a low permeability temporary and then final layer. The development of vegetation on the landfill cap and restoration of the site will follow the phasing programme set out in Table 2-11.

In estimating leachate quantities, precipitation data from the Edenderry Weather Station was used as the nearest available dataset. Average monthly rainfall from 25 years of data collected at the weather station was calculated and this was used to estimate the average annual rainfall at the weather station which would be a good representation of weather conditions at the proposed landfill site. The estimated annual rates of leachate production from the new landfill

are presented in Table 2-13 and show that leachate production is expected to peak in 2046 when it is predicted that the largest area of the landfill will be generating leachate prior to final capping of the final phases.

Table 2-13 – Estimated average leachate generation rates for the proposed new landfill

Year	Annual Leachate Volume (m^3)	Daily Leachate Volume (m^3)	Years of Generation
2026 NOTE 1	863	4.7	1
2027	6015	16.5	2
2028	18,699	51.2	3
2029	17,533	48.0	4
2030	20,017	54.8	5
2031	17,679	48.4	6
2032	20,658	56.6	7
2033	18,408	50.4	8
2034	21,387	58.6	9
2035	19,137	52.4	10
2036	22,248	61.0	11
2037	20,523	56.2	12
2038	24,158	66.2	13
2039	21,876	59.9	14
2040	24,885	68.2	15
2041	21,989	60.2	16
2042	24,472	67.0	17
2043	22,135	60.6	18
2044	25,113	68.8	19
2045	22,864	62.6	20
2046	25,843	70.8	21
2047	23,594	64.6	22
2048	26,704	73.2	23
2049	24,979	68.4	24
2050	26,051	71.4	25
2051	15,217	41.7	26
2052 NOTE 2	10,642	29.2	27
2053	8,912	24.4	28
2054	8,912	24.4	29
2055	8,912	24.4	30

NOTE 1 Placement of waste and therefore leachate generation is expected to commence in Q1 2026.

NOTE 2 The operational lifetime of the facility is 25 years and final capping of the last phase will be completed in 2053 as per Table 2-13.

The total quantity of leachate estimated to be generated from the landfill over its 25-year lifetime and allowing for 5 years generation post closure up to 2055 is approx. 596,417 m^3.

Figure 2-9 shows the trend of leachate generation over this time.

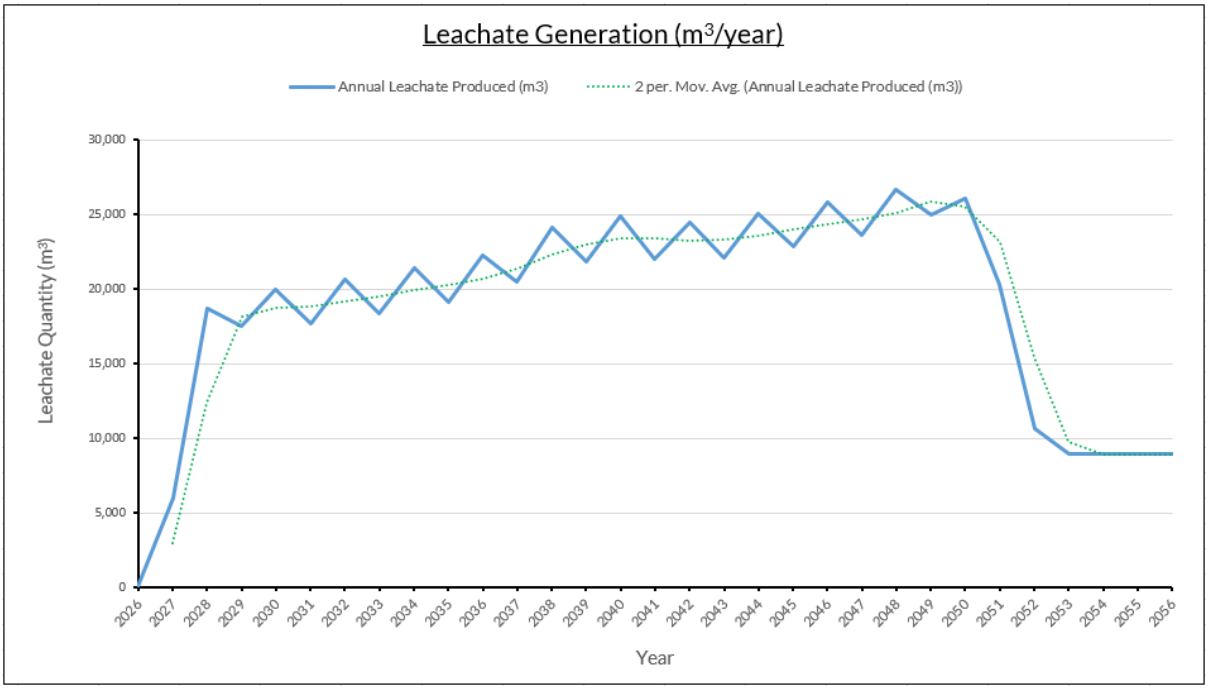

Figure 2-9 – Estimated trend in leachate generation

2.4.2 Composition of Leachate

Leachate quality depends on several parameters most notably[8]:

- 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.

As the proposed new landfill is essentially an extension of the existing landfill, and the same waste types will be accepted, the composition of leachate generated in the new landfill will be similar to that currently generated in the existing landfill. A copy of leachate sample analysis from Q4 2022 is included in Appendix 2-10. Results of leachate analysis are currently taken on a quarterly basis for submission to the EPA in accordance with the current IE Licence requirements. It is anticipated that a similar frequency of analysis and for a similar range of parameters will be required under a revised IE Licence for the proposed development.

As reported in the 2022 AER for the existing facility, the above results are typical of those from a relatively young municipal waste landfill.

2.4.3 Leachate Collection and Removal

Leachate collection within the waste body is described in Section 2.3.3. Once removed from the waste body, leachate will be transferred to one of three raw leachate storage tanks located in the leachate storage compound. There are two existing GRP leachate storage tanks with a

[8] EPA *Landfill Site Design Manual*

capacity of 200 m^3 each and as part of the proposed development, a third identical tank will be added in a bunded area in the compound as shown on Drawing No. 11290-2010 of Appendix 2-1.

Sensors in the leachate storage tanks which are connected to the SCADA network, will monitor the level of leachate in the tanks and automatically divert leachate to one of the three tanks as required. The operations team will monitor and control leachate distribution into the tanks which may also be varied based on the status of waste filling and/or recirculation of a proportion of the leachate.

Leachate will be transferred from the storage tanks to road tankers, typically with 32 m^3 capacity each. These tankers will collect leachate on a daily (5 days per week) basis for transfer to off-site approved facilities such as those listed in Section 2.2.5 which are currently used. As the leachate composition from the proposed new landfill will be similar to the current leachate quality, these facilities are suitable and appropriately permitted for acceptance of the leachate. The collection of leachate by tankers and transport by road to the off-site facilities is included in the traffic impact assessment in Chapter 14.

2.5 DESCRIPTION OF COMPOSTING PROCESS

It is proposed to increase the throughput of waste at the existing compost facility from 25,000 TPA up to 35,000 TPA. The additional 10,000 TPA throughput can be facilitated by optimising the existing operations and intensifying use of the existing infrastructure within the building. These operational changes will still remain within the procedures and limits for handling ABP required by the DAFM and will remain in compliance with the composting licence granted by DAFM. The proposed changes have been discussed with the DAFM Inspector and the DAFM have been consulted with as part of the preparation of this EIAR (refer to Section 1.7 of this EIAR).

In addition, a further 13 no. tunnels will be provided in the new MSW Processing and Composting Building which will allow for drying waste and additional composting capacity. Initially, it is estimated based on current market conditions that the combined MSW Processing and Composting Facility will operate with 55,000 TPA MSW intake and 35,000 TPA biowaste intake, however this intake rate may vary as the market conditions change, however the maximum total intake will not exceed 90,000 TPA. The new tunnels will have an internal area of:

- 7 tunnels at 27 m x 5.5 m with an average filling height for waste of 3.4 m.
- 6 tunnels at 30 m x 9.7 m with an average filling height for waste of 3.2 m.

The position and layout of the composting tunnels within the new building is shown on Drawing No. 11290-2081 of Appendix 2-1.

The processing and handling of biowaste in the new tunnels will be carried out in a similar way to the existing composting facility. The current DAFM composting approval will be extended to cover the new composting tunnels and processing areas with the same strict controls required for the handling of ABPs put in place. DAFM Inspectors will be provided with detailed design and operational arrangements for the handling of materials within the existing and new composting areas and any specific requirements will be adhered to in full.

This section provides a detailed description of the composting process which is currently carried out at the facility, and which will be intensified and extended under the provisions of the proposed development. The compost facility provides for the biological treatment of the following feedstocks:

- Organic fines; and
- Source separated bio-waste.

The design of the existing and proposed composting plant is flexible to allow for the acceptance and treatment of organic fines or source-separated bio-waste depending on market demands at any given time and evolving waste policy. There are slight variations in the composting process depending on which input material is being treated and these are described in the following sections.

Organic Fines

Organic fines is 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, this output material resembles compost. However, the quality of this material, due to the presence of contaminants such as glass and heavy metals, is not currently at a standard that would allow it to be spread on land. Rather, this material will be either recovered (as an engineering material as described in Section 2.2.4.1) or disposed of at the new landfill. The oversize material will also be disposed of at the new landfill.

Source Separated Bio-waste

Source separated bio-waste arises from the separate collection of food waste and garden waste at domestic, commercial and industrial premises. In Ireland, the collection of source separated bio-waste is typically facilitated by the provision of brown bins to domestic, commercial and industrial customers.

Both organic fines and source separated bio-waste are regarded as an ABP pursuant to EU Animal By-Products legislation (see Section 2.2.4.2).

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 reception bunker. The finished floor level of the waste reception bunker is approx. 2.5 m below the finished level of the external area. The waste receiving doors (Figure 2-10) are c. 4.5 m in width. Concrete kerbing and wheel guides, with a minimum height of 200 mm, are provided at each side of the waste receiving doors to guide trucks to the centre of the doorway. The waste reception doors are designed as rapid closing doors, with an opening or closing time of approx. 20 seconds.

Figure 2-10 – Image of waste receiving doors at existing compost plant

Waste received on the tipping floor is either moved to dedicated storage areas by loading shovel 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. New leachate holding tanks will be constructed as part of the new MSW processing and composting tunnel provision. Regular washdown is 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 period of time.

Waste Pre-treatment and Tunnel Feeding

Pre-treatment will be in the form of a low-speed shredder mixer (Figure 2-11), 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 content 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 loading shovel (Figure 2-12) 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 2-11 – Example of a low-speed shredder

Figure 2-12 – Example of a loading shovel operating in a compost plant

Tunnel Composting

The tunnel composting process is divided into the following phases:

- Phase 1 composting;
- Phase 2 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).

Phase 1 composting, Phase 2 composting 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 approx. 2-week period (Phase 1) after which it is moved to another tunnel for a further 2-week period (Phase 2). Phases 1 & 2 apply to both the treatment of organic fines feedstock and source separated bio-waste feedstock.

Following treatment in Phase 2, in the case of source separated bio-waste feedstock, the composted material is moved for a third time to another tunnel for maturation for a period of approx. 1 week. The maturation stage is not relevant to the treatment of organic fines.

Each composting tunnel (Figure 2-13) 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 2-13 – 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.

Exhaust air as well as the unused fresh air collected from the other areas of the compost plant flow through a humidifier, acid scrubber and a biofilter before being emitted to atmosphere. 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.

The existing biofilter units are located in the roof space of the composting plant, however as part of the proposed development a new extension will be constructed on the southern elevation of the compost building to house a new biofiltration and acid scrubbing system to treat the process air. The odour abatement system is described in more detail below.

Compost tunnels are also equipped with a sprinkling system which is used to balance the material moisture. Each tunnel has 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 building headspace. 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, such as during waste delivery.

Compost Refining

Following the tunnel composting process, the material is fed by a different 'dirty area' loading shovel 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 (for example a trommel screen or a star screen). The conveying line is also equipped with a magnetic separator for the removal of ferrous metals which are taken off-site to a suitably licensed recycling facility.

The screening process produces two fractions:

- In the case of organic fines feedstock:
  - <30mm
  - >30mm
- In the case of source separated bio-waste feedstock:
  - <12mm
  - >12mm

With source separated bio-waste feedstock, the undersize fraction (<12mm) 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 collection and disposal off-site. The treated compost material is collected in another bunker for onward transfer to the pasteurisation tunnel.

The oversized fraction (>12mm) 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. An example of a wind sifter is provided in Figure 2-14.

The wind sifting process 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.

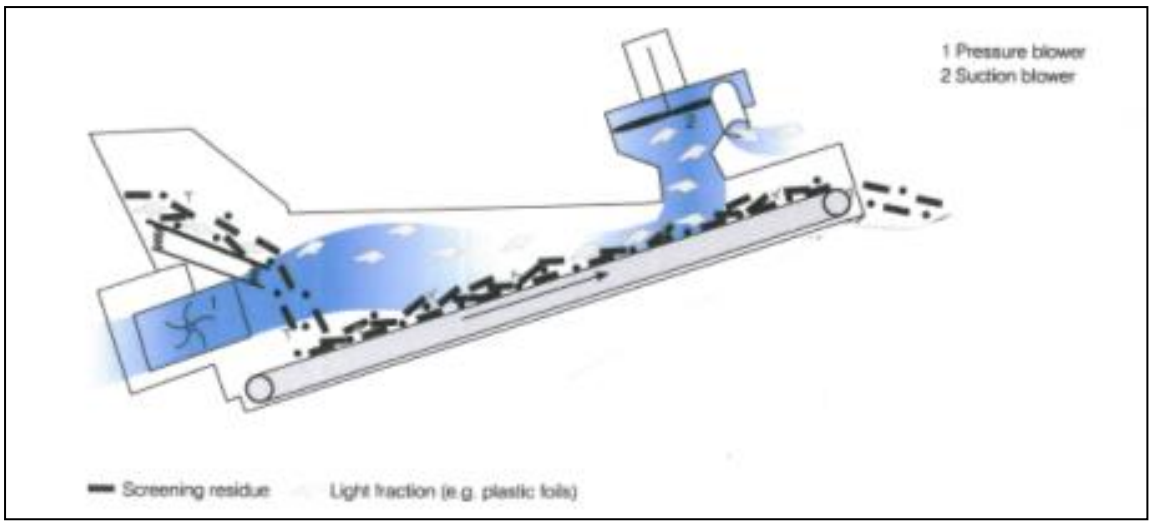

Figure 2-14 – Example of wind sifting

Compost Pasteurisation

In the case of source separated bio-waste feedstock, the undersize (<12mm) compost fraction is subjected to a pasteurisation stage to facilitate its application on land in accordance with ABP legislation. The pasteurisation stage is not relevant in the treatment of organic fines as the composted material is not of a suitable quality for application on land and therefore does not need to meet compliance tests for harmful pathogens.

The pasteurisation tunnel consists of a single insulated tunnel through which all material must pass in order to move from the 'dirty' area to a '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 of 70°C for a period of one hour have been achieved and recorded within the pasteurisation tunnel, the material is ready to be unloaded to the 'clean' area of the plant. The doors on the 'clean' side are opened and the pasteurised compost is removed.

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 a dedicated clean area loading shovel 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 holding until such time at the material is removed from the plant.

The existing compost plant at the Drehid WMF has capacity and flexibility to accept either organic fines material for composting or source segregated bio-waste, depending on the market demands at any given time. Approval is sought from DAFM to switch between the two feedstocks as the handling and testing procedures vary as set out above. Specifically in respect of pasteurised compost which is suitable for land spreading, compliance testing for e. coli and salmonella are required to prove the suitability of the material.

Odour Abatement

A new odour abatement system will be installed at the existing composting building and, separately, as part of the new MSW processing and composting building. The odour abatement system for both facilities will work in an identical manner with controlled air from within the buildings directed through an acid scrubber and enclosed biofiltration bed before release to atmosphere via a stack.

Two new biofilters will be constructed to treat air from the existing composting plant (Biofilter 1A and 1B) and two biofilters will be installed for treatment of controlled air from the new building (Biofilter 2A and 2B). The locations of the biofilters are shown on Drawing No. 11290-2081 of Appendix 2-1. The buildings enclosing the biofilters will be a 'lean-to' steel structure with cladding and finishes identical to the existing composting building. These structures will also include plant rooms and underground reservoir to collect condensate run-off from the biofilters. An additional 'Technical Room' will be constructed as shown on Drawing No. 11290-2081 of Appendix 2-1 to include fans, scrubbers and a control room to service the new building and will also include welfare facilities for staff. The position of the technical room is shown on Drawing No. 11290-2081 of Appendix 2-1. Storage of acid required for the scrubbers will be in dedicated double skinned tanks.

The positioning of the biofilters at ground level will make it easier and safer for filter bed media to be refreshed as required and to facilitate the refilling of the acid dosing tanks for the scrubbers.

Each biofilter will have a stack associated with it to a height of 17 m above ground level as shown on Drawing No.'s 11290-2082 and 2083 of Appendix 2-1. The stacks will have a circular profile with an exit diameter of 1.2 m (Biofilter 1A and 1B) and 1.1 m (Biofilter 2A and 2B). A platform to provide access for monitoring and measuring of the emissions will be provided at c. 14 m height on the stacks.

2.6 DESCRIPTION OF MSW PRE-TREATMENT PROCESS

The following sections describe the proposed MSW processing activities that will be carried out at the facility in the new MSW processing and composting building. Incoming MSW waste will be from RCVs collecting MSW locally from households and businesses as well as bulk trailers bringing waste typically over longer distances from waste transfer/bulking sites. The MSW incoming for treatment in the new building will not have been subject to pre-treatment prior to arrival at the Drehid WMF.

Waste Acceptance

As per the composting plant, the waste reception area will be such that waste delivery vehicles are not required to enter the building. Waste delivery vehicles reverse to the waste receiving doors and discharge waste down into the reception bunker. The finished floor level of the waste reception bunker is approx. 2.5 m below the finished level of the external area. There will be four waste receiving doors which will be 4.5 m in width and 6 m in height. Concrete kerbing and wheel guides, with a minimum height of 200 mm, will be provided at each side of the waste receiving doors to guide trucks to the centre of the doorway. The waste reception doors are designed as rapid closing doors, with an opening or closing time of approx. 20 seconds. The doors will also be fitted with air curtains to minimise the escape of odorous emissions when a door is opened.

Waste received on the tipping floor is either moved to dedicated storage areas by loading shovel 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 is carried out 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 period of time.

Waste Pre-Treatment

Following the discharge of waste into the waste reception bunker, the waste will be loaded into a low-speed shredder/bag opener by a loading shovel to expose the waste and mix the incoming materials.

A bag opener (Figure 2-15) is essentially a slow speed coarse shredder. The slow rotating speed of the bag opener shafts 'rips' bags and liberates their contents. Importantly, the bag openers perform a 'ripping' function as opposed to a fine 'shredding' function. As a result, large items are reduced in size without the fine shredding of smaller items. Hence, the bag opening process causes minimum contamination and damage to potential recyclables thereby optimising the extraction of such materials in a downstream process.

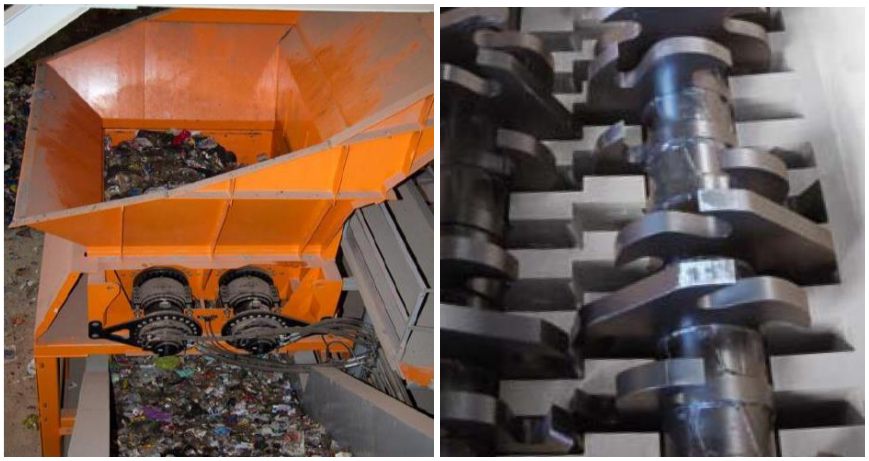

Figure 2-15 – Typical example of a bag opener (left) and cutting shaft arrangement (right)

The waste reception bunker will be provided with suitably sized concrete push walls in order to facilitate the handling, moving and storage of waste. During this process, the waste will be inspected for any waste types which may not be suitable for processing, such as large/bulky items, dangerous items or hazardous wastes. Any unsuitable items will be removed immediately from the stream and moved to a quarantine area for further inspection and removal off-site to a suitably permitted or licensed waste facility.

The output material from the shredder will be a well-mixed and exposed MSW material which is collected in a dedicated bunker.

Drying of Waste

The first treatment stage will be the transferring of the MSW waste from the bunker into large drying tunnels. There will be six drying tunnels provided within internal area of 29.5 m x 9.7 m each. Waste will be placed in the tunnels using the loading shovel to a height of approx. 3.4 m. The material will remain the drying tunnels for a period of 10-12 days during which time the material quantity will be reduced through the loss of moisture and breakdown of organic content.

Waste Processing

Following drying, the material will be moved by loading shovel from the tunnels to a hopper where it will pass along a conveyor belt. The material will first pass through separators designed to remove ferrous and non-ferrous metals from the waste, typically using magnets and eddy current technology. Ferrous and non-ferrous metals will be stored separately and bulked up in dedicated bays for transfer off-site to suitable waste facilities for further processing.

Following removal of metals, the waste will pass through a screen, such a star screen or similar, to separate the undersize (<60 mm) and oversize (>60 mm) materials. The undersize material will typically be high in organic content and is regarded as organic fines material as described previously in Section 2.2.4. These organic fines material will be collected and transferred by loading shovel to the composting tunnels for further treatment. The process for treating the organic fines in the composting tunnels is described in Section 2.5.

The remaining oversize fraction will be subject to further processing to remove plastics using near infrared (NIR) optical sorting technology (Figure 2-16). The plastics fraction will be transferred to a dedicated bay where it will be baled and prepared for removal off-site to suitable waste facilities for further processing.

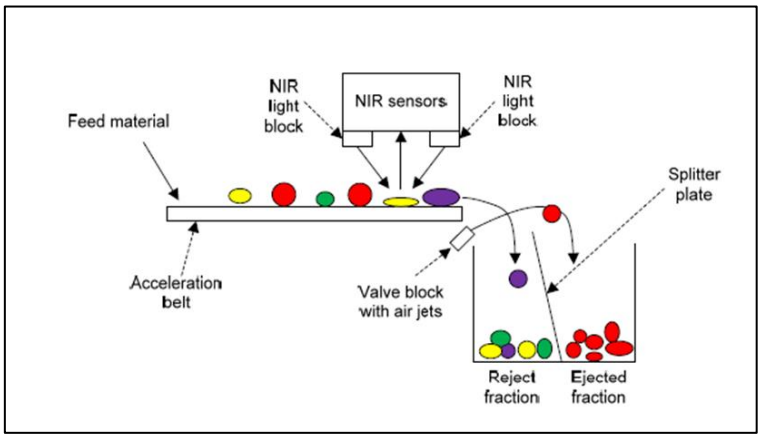

Figure 2-16 – NIR optical sorter principle

The remaining oversize (>60 mm) material comprises waste which will be suitable for use as RDF or feed material to produce SRF. It is not proposed to further process or package this material on site at the Drehid WMF. The oversize material will be collected from the conveyor and transferred to a separate loading bay where it will be bulked up and loaded into bulk trailers for removal off-site to suitable waste facilities for recovery or further processing.

The above steps in the treatment of incoming MSW will ensure there is maximum recovery of metal and plastic recyclable materials from the incoming waste stream and the removal of high organic content material which is subject to further biological treatment to reduce the organic content and make the material suitable for disposal to landfill or recovery as landfill cover. The residual (oversize) fraction will not be further processed on site at Drehid but will be exported from the site as an RDF material which can be used in thermal waste treatment facilities, co-fired in cement kilns to replace fossil fuels, exported or further processed to produce SRF material. Further discussion on waste outputs is provided in Section 2.2.5.

The proposed layout and configuration of the new MSW processing and composting building has been designed to optimise material flows and access within the building and to maximise segregation of materials which have been sorted on the conveyor belt or in screens. The layout

is also future proofed to include provision for further screening of waste materials depending on industry and regulator (EPA) requirements.

The control of air from within the building and the treatment of odorous air generated from the MSW pre-treatment process will be through the odour abatement system comprising an acid scrubber and biofilter as described in Section 2.5.

2.7 CONSTRUCTION MANAGEMENT

2.7.1 Construction Environmental Management Plan

A planning stage Construction Environmental Management Plan (CEMP) has been prepared to set out the proposed management and administration of site activities for the Construction Phase of the proposed development, to ensure that all construction activities are undertaken in an environmentally responsible manner. The CEMP summarises the environmental commitments of the construction project including mitigation and monitoring measures, and the measures to ensure compliance with legislation and the requirements of statutory bodies and is included in Appendix 2-5.

The CEMP is a live document and will be reviewed and updated, as necessary, throughout the construction of the development. Upon appointment, the Main Contractor(s) for construction of the project shall update this document to produce a construction stage CEMP which will account for any additional requirements set out in Planning Conditions or agreed upon with the Planning Authority or other relevant Bodies post planning submission.

2.7.2 Construction Programme and Sequencing of the Development

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

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

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

completion of temporary/intermediate capping of the last section of Phase 16, works will commence on final profiling and installation of the final capping.

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

Figure 2-17 sets out an outline programme for the construction of the Proposed Development showing the key steps in the initial construction works which include Phase 16 of the landfill. The indicative timeline for the development of Phase 17, 18 and 19 is also shown to illustrate the gradual nature of the landfill development. The commencement of waste placement in Phase 16 of the new landfill infrastructure is contingent upon the filling of available void space in Phase 15 of the existing landfill. At the current rate of filling, the available void space in Phase 15 is expected to be exhausted in 2026. This line item in the programme in Figure 2-15 includes a 'float' allowance to ensure the new landfill infrastructure is developed in adequate time prior to completion of waste placement in Phase 15.

The initial construction works (Construction Stage 1) comprise an area of 13.9 ha which is approx. 22% of the total new development footprint area. Subsequent construction of each phase of the landfill will have an area of approx. 3.5 ha allowing for the landfill footprint as well as extending drainage, utility, leachate collection, gas collection and road infrastructure as the landfill footprint expands. Figure 2-18 illustrates the gradual development of the landfill footprint from the initial construction works and through each of the subsequent landfill phases.

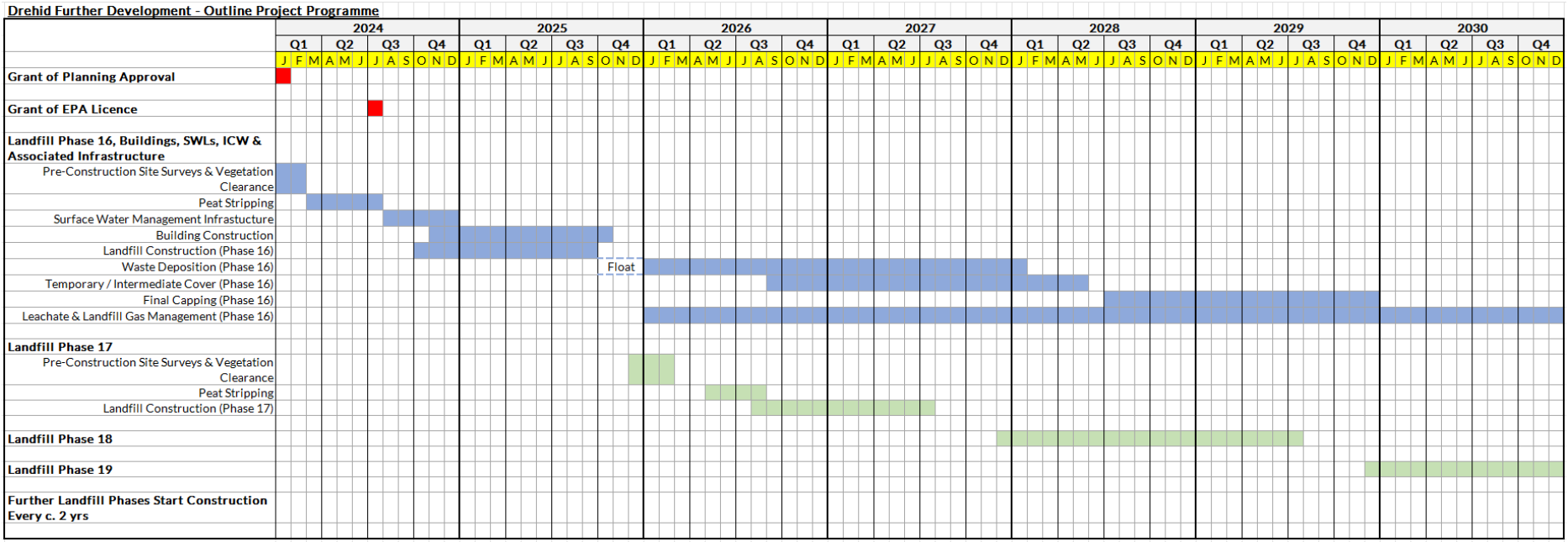

Figure 2-17 – Outline programme for construction of the Proposed Development

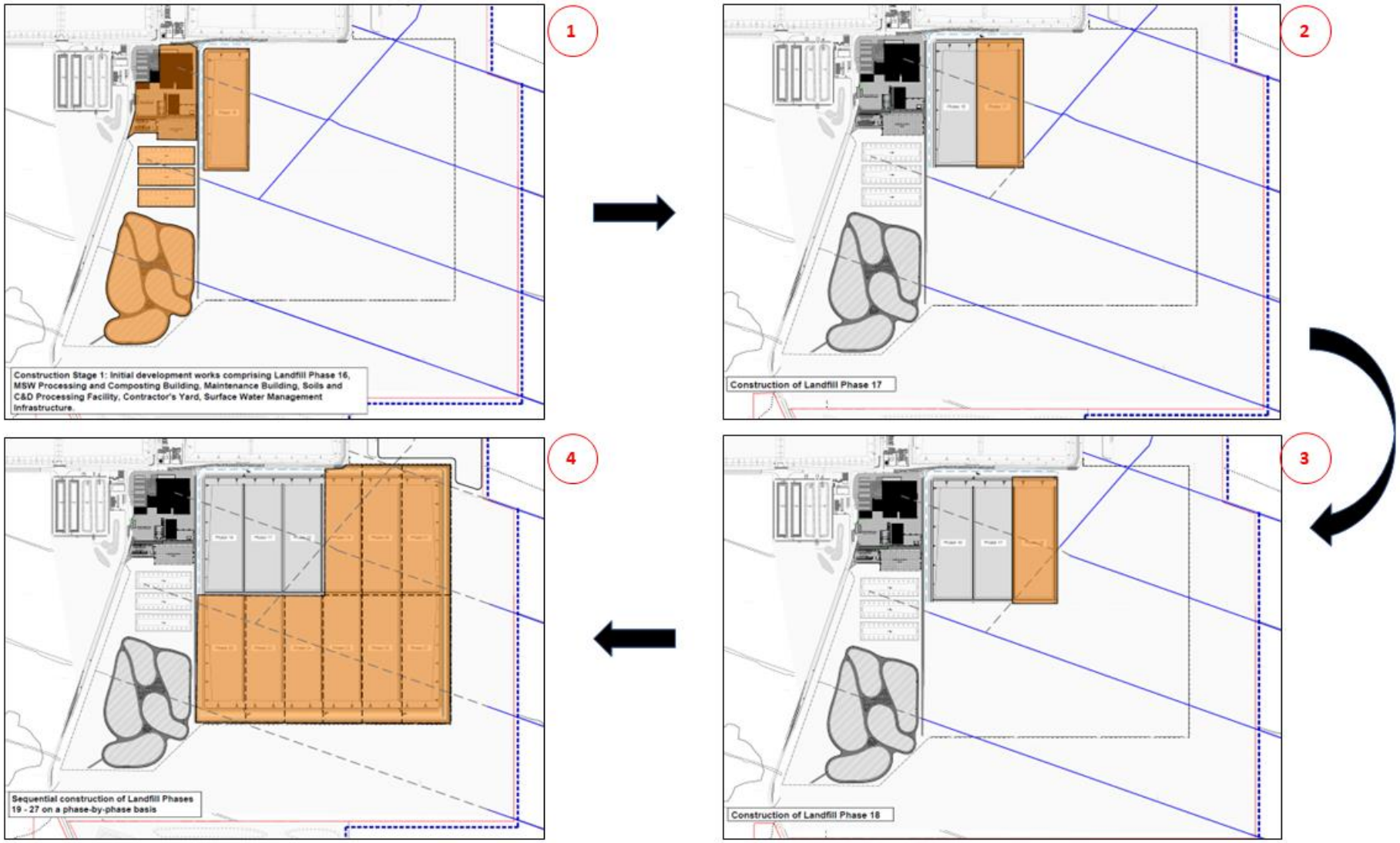

Figure 2-18 – Illustration of the gradual development of proposed infrastructure

2.7.2.1 Construction Hours

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

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

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

2.7.2.2 Sequencing of Construction Activity

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

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

Following vegetation clearance and the installation of drain blocks, works will commence to remove peat from the works area. Peat stripping works, particularly in areas of deepest peat, will be planned for completion outside of winter months, where possible, when groundwater levels are naturally lower, and the working surface is drier. Peat stripping will commence in the south-western corner to allow construction of the ICW area and construction stage SWL (SWL 7). Some peat stripping will also commence in the footprint of Phase 16 so that subsoils can be removed for the construction of the SWL embankments and the compacted liner for the ICW. The surface water infrastructure will be developed first so that it can be brought into operation and construction stage surface water management can be routed through this infrastructure. To facilitate the construction of the ICW and construction stage SWL, any surface water run-off within the works area will be pumped into the surface water swale which runs around the perimeter of the existing landfill. This will ensure that construction stage waters are treated through the existing SWLs (SWL1 to SWL4) and the existing ICW prior to the proposed surface water management infrastructure being built. This is described further in Section 2.7.3.

Figure 2-19 sets out the sequence of activities that will be carried out for the initial construction works (Construction Stage 1) at the site to ensure that surface run-off from the bog is suitably managed and does not result in elevated suspended solids in the surrounding drainage network. Managed construction waters from the active works areas will be diverted to ensure it is passing through the SWLs and ICW areas prior to discharge from the site. This will be achieved, following the sequence of activities below, using a combination of existing infrastructure and new infrastructure. Once the surface water management infrastructure proposed as part of this new development is established, all managed construction waters, and in due course

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

Figure 2-19 – Sequence of activities on commencement of construction works

2.7.3 Construction Methodology

2.7.3.1 Site Clearance, Drain Blocking and Peat Stripping

Site clearance and peat stripping, under the supervision of an archaeologist, will involve the use of excavators specifically designed with wide tracks to operate in peat environments. The Applicant, Bord na Móna, has considerable experience in the operation of plant and machinery in peat environments and will ensure that these initial development works are only carried out by experienced operators with suitable machinery.

Peat material will be gradually excavated, in accordance with the construction sequencing set out in Section 2.7.2, and loaded into suitable off-road dumpers, such as moxy dumpers or similar. Access for the dumpers will be provided on stable ground using existing site materials or imported aggregate to create a safe working platform. The dumpers will remove peat from the works areas and deposit it at the locations of the environmental screening berms surrounding the landfill as shown on Drawing No. 11290-2010 of Appendix 2-1. Vegetation will be cleared from the position of the screening berms prior to deposition of peat and silt fences put in place at the toe of the proposed embankments.

Peat removal will be carried out until suitable bearing material is encountered. The foundation design for the proposed buildings will be carried out at detailed design stage and site investigations will be carried out to determine the most suitable foundation type. The SWLs and ICW areas will be constructed on top of suitable bearing strata using subsoils excavated from the landfill footprint.

2.7.3.2 Site Drainage and Surface Water Management

As part of the construction of the Proposed Development, the existing bog drains which cross the infrastructure footprint will be removed. This will occur on a phased basis as part of site

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

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

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

2.7.3.3 Landfill Construction

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

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

Once BES placement is complete, the HDPE geomembrane is rolled out over the surface and jointed using specialised welding equipment and carried out by trained welding technicians. A second geotextile layer is placed over the geomembrane and finally a layer of drainage stone is laid to allow leachate generated in the landfill to be collected and transferred out of the landfill to the leachate storage tanks. Quality assurance testing is carried out at all stages of the liner construction to ensure the integrity of the engineered layer. Results of testing carried out on the liner components are collated and retained on site for inspection.

As construction of the landfill liner progresses, works will also be carried out outside the liner footprint to transfer leachate and landfill gas away from the landfill for storage and treatment.

Electrical and telecommunications equipment will be installed adjacent to the landfill and roads and surface water management infrastructure will be extended alongside the landfill embankments on a phased basis as required. Blanked end caps will be installed, and tested, on mechanical pipework to allow for future connections and surplus ducting will be installed as necessary for future services.

2.7.3.4 Integrated Constructed Wetlands

An ICW is proposed as a final treatment step for surface run-off from the proposed development. The ICW has been designed by Vesi Environmental, who are specialists in the field. A separate Planning Report in respect of the ICW design and installation is provided in Appendix 2-4.

The main stages of the ICW construction works as set out in this report are presented in Table 2-14.

Table 2-14 - Main stages of ICW construction works (Extract from Planning Report prepared by Vesi Environmental)

Table 5: Main stages of ICW construction works	
Stage 1	Setting out cell layouts
Stage 2	Excavation of peat to subsoil silt/clay. Import of suitable clay subsoils (from within the facility) to build up cell base and embankments to design level. Layering, tracking and compaction of soils for cell liner - minimum depth of soil liner. Seal must be proven at base of ICW treatment cells.
Stage 3	Creation of embankments: • sloping embankments ○ Cell 1-5: 1:2 • height of embankment ≥1.0 m • width of embankment tops min. 3.5m wide (stability and access around the wetland) Placement in layers and compaction during construction.
Stage 4	Distribution of peat soils over the base of each cell as growing medium
Stage 5	Interconnecting pipework, treatment cells
Stage 6	Placement of riprap beneath interconnecting pipework (inlet and outlet) in each cell (inhibit encroachment of wetland vegetation)
Stage 7	Planting each cell with emergent vegetation – Each cell planted with 1-2 plants/m^2.
Stage 8	Landscaping of ICW cells and embankment area

2.7.4 Excavated Materials Balance

The excavated materials that are estimated to be generated during the construction phase are presented in Table 2-15 along with the estimated fill volumes.

Table 2-15 – Cut and fill material estimates

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

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

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

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

2.7.5 Construction Compound

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

Further details on the construction compound are provided in Section 3.4 of the CEMP.

2.7.6 Construction Quality Assurance

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

CQC procedures will include the integrity testing of all landfill lining systems, surface water, foul water, process water pipework and structures in accordance with industry accepted standards

and procedures which will be set out in the CQA Plan. All integrity testing will be inspected and witnessed by a suitably qualified and experienced Bord na Móna Engineer, or appointed Consultant Engineer acting on their behalf. Integrity test certificates will be signed by both the Contractor's Engineer and the Engineer representing Bord na Móna.

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

2.7.7 Environmental Monitoring

The proposed construction phase environmental monitoring requirements are set out in the specialist technical chapters and in Section 6 the CEMP.

2.8 DECOMMISSIONING MANAGEMENT

The new landfill infrastructure has a proposed operational lifetime of 25 years after which the landfill will be fully capped and will enter an aftercare phase (see Section 2.9). Any ancillary infrastructure associated with the landfill will be decommissioned where it is not required for the long-term aftercare, i.e., leachate and landfill gas management. Groundwater pumps maintaining low water levels below the liner during the construction and operational phases will be decommissioned. Some pumps may be retained on site for alternative uses or where not required, will be removed from site.

As part of this proposed development, permission is sought to remove the operational lifetime restriction for the composting plant which is currently scheduled to cease operations in 2028. As such, it is not intended to cease operations and decommission the compost plant, as there is an ongoing and ever-increasing requirement to provide suitable waste treatment infrastructure for organic waste streams. Similarly, the MSW processing facility will not have an operational lifetime restriction and will not have a planned decommissioning date. The installed plant and equipment will be subject to regular scheduled servicing and planned maintenance to ensure that it is working to optimal performance at all times. Replacement and upgrading of equipment will be carried out as necessary to maintain optimal performance.

In the event that the composting plant and MSW processing plant are to be decommissioned, the following measures will be undertaken to ensure that there will be no adverse environmental effects from the closed facilities:

- 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, that are not required for long-term aftercare, 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 relevant 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.

When the operations have ceased on site, as per the requirements of the Landfill Directive, monitoring and analysing of landfill gas and leachate from the site and the groundwater regime in the vicinity of the site, shall continue as required by the EPA.

As per the current licensed facility, a Closure, Restoration and Aftercare Management Plan (CRAMP) will be required to be agreed with the EPA setting out the criteria for a successful and safe decommissioning of the site including the putting in place of a financial provision to cover the cost of same. An extract from the current CRAMP setting out the 'Closure Tasks & Programme' for the existing facility is included in Appendix 2-11. This CRAMP will be updated to account for the proposed development as part of the IE Licence review process.

2.9 RESTORATION AND AFTERCARE

The landfill body will be restored as per the proposed levels set out in the restoration drawing (Drawing No. 11290-2070 of Appendix 2-1) and in accordance with the landscaping plan (11290-2071).

The commitments to restoration and aftercare are as follows and adhere to the guidance set out in the EPA's *Landfill Manual: Landfill Restoration and Aftercare* (1999):

- On cessation of filling at each cell of the landfill, the final capping layer will be installed which will include a low permeability LLDPE liner and soil layer;
- 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 landscape proposals outlined in Chapter 11;
- Gas extraction and leachate treatment will continue post closure; and
- Monitoring of gas, surface and groundwater quality and other parameters as outlined in Section 2.2.11 will continue post closure.

The proposed landscaping measures are set out in detail in Chapter 11 and will be implemented on a phased basis as the landfill surface is capped and waste placement ceases. The landscaping plan will be kept under continuous review to ensure the objectives of minimising visual impacts and promoting natural revegetation are achieved.

As per Section 2.8, a CRAMP will be prepared and agreed with the EPA as part of the IE Licence for the overall facility. This CRAMP will include the provision of a financial bond to fund the long-term restoration and aftercare of the facility following cessation of waste placement in the landfill. The current CRAMP in place for the existing facility will be updated and amended to include the proposed infrastructure.

2.10 REFERENCES

- BS ISO 5667-11:2009 – Water quality. Sampling - Part 11: Guidance on Sampling of groundwaters
- Department of Communications, Climate Action and Environment (DCCAE), *A Waste Action Plan for a Circular Economy* (2020)
- Environment Agency (EA) (UK), *LFE5 – Using geomembranes in landfill engineering* (2014)
- EPA, *Guidance on Retention Requirements for Firewater Run-off* (2019)
- EPA, *Guidance note for Noise Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)* (2016)
- EPA, *Guidance Note on Daily and Intermediate Cover at Landfills* (2014)
- EPA, *IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities* (2013)
- EPA, *Landfill Manuals: Landfill Monitoring (2003)*
- EPA, *Landfill Manuals: Landfill Operational Practices (1997)*
- EPA, *Landfill Manuals: Landfill Restoration and Aftercare (1999)*
- EPA, *Landfill Manuals: Landfill Site Design* (2000)
- EPA, *Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2018)
- German Engineering Institute VDI 2119 *Measurement of Dustfall Using the Bergerhoff Instrument (Standard Method)*
- Health and Safety Authority (HSA), *Code of Practice for the Chemical Agents Regulations* (2016)
- wrc, *Dublin Waste to Energy (DWtE) – Characterisation and Classification of IBA* (2019)