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Bord na Móna

Drehid Waste Management Facility – Further Development

Appropriate Assessment Screening Report

May 2023

PROJECT NAME: DREHID WASTE MANAGEMENT FACILITY – FURTHER DEVELOPMENT

Appropriate Assessment Screening Report

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1.0 INTRODUCTION

Bord na Móna Plc. (BnM) operates the Drehid Waste Management Facility (WMF), situated near Carbury, County Kildare. The Drehid WMF is an integrated WMF which principally includes a municipal solid waste (MSW) landfill and a Composting Facility. The Drehid WMF operates subject to an Industrial Emissions Directive (IED) licence, issued by the EPA, (W0201-03) and subject to the planning approval for the facility. BnM intends to apply to An Bord Pleanála for planning permission to increase the existing facility for additional waste capacity at the Drehid WMF. The proposed development includes the additional landfill capacity (non-hazardous) as well as allowing for additional capacity for the composting process. It also includes other associated works, buildings and roads. Full project details are provided in Section 0 of this report.

TOBIN Consulting Engineers (hereafter referred to as TOBIN) has prepared this Screening for Appropriate Assessment (AA) report on behalf of BnM in support of a planning application to An Bord Pleanála for the proposed development. The purpose of this report is to inform the AA process, which is carried out by the competent authority (in this case An Bord Pleanála). Appropriate Assessment is an assessment of whether a plan or project, alone and/or in-combination with other plans or projects, may have likely significant effects on a European site, collectively known as the Natura 2000 network, in view of the site's conservation objectives.

This report provides information to assist the competent authority in undertaking a Screening Assessment of the proposed development and was informed by a desktop study and ecological field surveys. The field surveys and report were undertaken and prepared by TOBIN Consulting Engineers (TOBIN) Senior Ecologist, Sinead O'Reilly (M.Res), and TOBIN Senior Ecologist, Áine Sands (B.Sc.) and was senior reviewed by TOBIN Senior Ecologist Joao Martins (B.E. M.Sc.). Further detail on competency is included in Section 3.6 of this report.

2.0 THE APPROPRIATE ASSESSMENT PROCESS

The AA process is an assessment of significant effects of a plan or project, alone and/or in-combination with other plans or projects, on the conservation objectives of a European site(s). The Natura 2000 network is made up of European sites including Special Protection Areas (SPAs), established under the EU Birds Directive (2009/147/EC) (more generally referred to as the 'Birds Directive') and Special Areas of Conservation (SACs), established under the EU Habitats Directive (92/43/EEC) (more generally referred to as the 'Habitats Directive'). The Natura 2000 network helps provide for the protection and long-term survival of Europe's most valuable and threatened species and habitats.

The Screening Stage of the AA process identifies any likely significant effects upon European sites from the proposed development alone or in-combination with other projects or plans. In accordance with Article 6, paragraphs (3) and (4), a series of questions are asked during the Screening Stage of the AA process to determine:

- whether a plan or project can be excluded from AA requirements because it is directly connected with or necessary to the management of a European site; and
- whether the project or plan will have a potentially significant effect on a European site, either alone or in-combination with other projects or plans, in view of the site's conservation objectives or if residual uncertainty exists regarding potential impacts.

2.1 Legislative Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as the 'Habitats Directive', provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000 network.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European sites (Annex 1.1). Article 6(3) establishes the requirement for AA:

> *'Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.'*

Article 6(4) states:

> *'If, in spite of a negative assessment of the implications for the [Natura 2000] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.'*

The provision for an AA is transposed into Irish law by Part XAB of the Planning and Development Act 2010 (as amended). Section 177U (4) of the said Acts provides for screening for Appropriate Assessment as follows:

> *'The competent authority shall determine that an appropriate assessment of [...] a proposed development [...] is required if it cannot be excluded, on the basis of objective information, that the [...] proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.'*

Section 177U (5) provides as follows:

> *'The competent authority shall determine that an appropriate assessment of a [...] proposed development, [...], is not required if it can be excluded, on the basis of objective information, that the [...] proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.'*

An AA should be based on best scientific knowledge and the competent authority should ensure that expertise such as ecological, geological, and hydrological are utilised, where relevant.

The Court of Justice of the European Union (CJEU) has made several rulings in relation to AA, regarding when it is required, its purpose, and the standards it should meet. Consideration has

been given to the evolution in interpretation and application of directives and national legislation arising from jurisprudence of the European and Irish courts, in respect of Article 6 of the Habitats Directive.

2.2 Stages Involved in the Appropriate Assessment Process

There are potentially four stages in the AA process; the result of each stage determines the requirement for assessment under the next.

Stage 1: Screening / Test of Significance

This process identifies the likely significant effects upon a European site from a proposed project or plan. Its purpose is to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project which is not directly connected with or necessary to the management of the site as a European site, individually or in-combination with other plans or projects is likely to have a significant effect upon the European site, in view of its conservation objectives. A project may be 'screened-in' if there is a possibility or uncertainty of possible effects upon the European site, requiring a Stage Two AA. If there is no evidence to suggest significant effects due to the proposed plan or development the project is 'screened-out' from further assessment.

Stage 2: Appropriate Assessment

In this stage, consideration is given to ascertain whether the plan or project would adversely affect the integrity of a European site(s), either alone or in- combination with other plans or projects, with respect to the European site's structure and function and its conservation objectives. This stage of the assessment is carried out by the consenting authority and is informed by a NIS. A NIS is required where there is uncertainty as to whether or not an adverse effect arises, uncertainty of the effect itself, or a potential effect has been defined which requires further procedures/mitigation to remove uncertainty of a defined impact (i.e. significant effects cannot be excluded). Where there are adverse effects, an assessment of the potential mitigation to ameliorate those effects is required. If the assessment results in a negative conclusion, i.e. adverse effects on the integrity of a site cannot be excluded (by design or mitigation) or there is uncertainty as to whether an adverse impact arises, then the process must consider alternatives (Stage 3) or proceed to Stage 4.

Stage 3: Assessment of Alternatives

This stage of the potential process arises where adverse effects on the integrity of a European site cannot be excluded and examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the European site. However, in circumstances where there will not be any adverse effects on any European site, the developer places no reliance upon this third stage of the process in the context of this application for planning permission for the proposed development.

Stage 4: Assessment Where Adverse Effects Remain

This is the derogation process of Article 6(4), which examines whether there are imperative reasons of overriding public interest [IROPI] for allowing a project to proceed where adverse effects on the integrity of a European site have been predicted. Compensatory measures must be proposed and assessed as part of this stage and the EU Commission must be informed of the compensatory measures. Again, the developer places no reliance upon this stage of the process in the context of the application for planning permission for the proposed development.

3.0 METHODOLOGY

3.1 Legislation and Guidance

This report has been prepared having regard to the following guidance:

- Communication from the Commission on the Precautionary Principle. Office for Official Publications of the European Communities, Luxembourg (European Commission [EC] 2000).
- Nature and Biodiversity Cases: Ruling of the European Court of Justice. Office for Official Publications of the European Communities, Luxembourg (EC, 2006).
- Managing Natura 2000 Sites – The provisions of Article 6 of the Habitats Directive 92/43/EEC. European Commission (EC, 2018).
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (EC, 2013).
- Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities, Department of the Environment, Heritage and Local Government (DoEHLG, 2010).
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. Office for Official Publications of the European Communities, Luxembourg (EC, 2007).
- Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg (EC, 2001).
- Assessment of Plans and projects in relation to Natura 2000 sites – Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EC, 2021a).
- Appropriate Assessment Screening for Development Management. Office of the Planning Regulator (OPR) Practice Note PN01 (OPR, 2021).
- Planning and Development Act 2000, as amended including Part XAB.
- Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (European Commission, 2021b).

This report has similarly been prepared with regard to relevant rulings by the Court of Justice of the European Union (CJEU), the High Court, and the Supreme Court. A review of *Article 6 of the Habitats Directive, Rulings of the European Court Justice* (Sundseth & Roth, 2014) and other relevant rulings was undertaken[1].

Definitions of conservation status, integrity and significance used in this assessment are defined in accordance with '*Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*' (EC, 2018):

- Favourable conservation status (FCS) can only be defined and achieved at the level of the natural range of a species or a habitat type. A broad conservation objective aiming at achieving FCS can therefore only be considered at an appropriate level, such as for example the national, biogeographical or European level. The conservation measures have to correspond to the ecological requirements of the natural habitat types in Annex I and of the species in Annex II present on the site. The ecological requirements of those

[1] Irish Legal Information Imitative: https://irlii.org/leading-cases-environmental/

natural habitat types and species involve all the ecological needs which are deemed necessary to ensure the conservation of the habitat types and species. They can only be defined on a case-by-case basis and using scientific knowledge.

- The integrity of a European site is defined as the coherent sum of the site's ecological structure, function, and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated.
- Significant effect should be determined in relation to the specific features and environmental conditions of the protected site concerned by the plan or project, taking particular account of the site's conservation objectives and ecological characteristics.

3.2 Study Area

The proposed development site, which is approximately 262 hectares (ha) in size, occurs within the Timahoe South Bog situated within the Bord na Móna landholding, which comprises a total of 2,544 ha. The proposed development site, which is owned by Bord na Móna, was previously used, up to approximately 35 years ago, for the production of sod peat for energy generation. Since the cessation of peat production, the fields of bare peat have recolonised with vegetation and have remained predominantly undisturbed.

The majority of the proposed development site occurs within the Barrow WFD Catchment (catchment ID_14) and is hydrologically connected via the Cushaling River (the Cushaling River name is retained for reference purposes, recognizing that it is part of the "Figile_010" Water Framework Directive river water body). In addition, a small area of the far north-eastern boundary of the proposed development site occurs within the Boyne WFD Catchment (catchment ID_07) and is hydrologically connected via the Mulgeeth Stream and the Blackwater (Longwood)_010.

The study area includes the proposed development site, plus the immediate surrounding area. The extent of the surrounding area was defined by establishing the Zone of Influence (ZoI). Further details on the ZoI of the proposed development are provided in Section 6.4.

3.3 Consultations

Consultation with various state agencies and environmental Non-Governmental Organisations (NGOs) was undertaken in February 2022 to inform this EIAR. Ecologically associated state agencies and NGO's, relevant to the proposed development, were contacted in order to obtain any additional information and data, which may be useful in informing this assessment. The following organisations were contacted:

- Development Application Unit (DAU);
- National Parks and Wildlife Service (NPWS);
- Bat Conservation Ireland (BC Ireland);
- BirdWatch Ireland (BWI);
- Inland Fisheries Ireland (IFI);
- Irish Wildlife Trust (IWT);
- Irish Peatland Conservation Council (IPPCC); and
- Irish Native Woodland Trust (INWT).

At the time of writing this report, no response was received from the DAU, NPWS, BWI, IPPC or INWT. The BC Ireland and IWT responded and advised they did not have the capacity to review the details of the proposed development and did not provide any further commentary. Despite the lack of responses from the above mentioned state agencies and NGOs, it is considered that

a robust assessment was undertaken using publicly available data and final conclusions were not hindered.

Correspondence in the form of a letter was received from IFI on the 1st April 2022. The letter highlighted the importance of the Cushaling/Figile catchment and emphasised potential impacts which should be managed. IFI noted that salmon spawning/recruitment occurred in the Figile River during winter 2021-2022 surveys, a relatively short distance downstream of the proposed development site, and noted that the Cushaling has the potential to provide important spawning grounds for the population of salmon designated within the River Barrow and River Nore SAC located downstream. IFI indicated however that salmon spawning has been impacted by works associated with historic commercial peat harvesting, and restoration of spawning recruitment throughout the river system is important.

IFI additionally noted specific issues with the upper reaches of the Figile River which rises near the proposed development site. It stated that almost all of this watercourse has been subject to modification causing significant hydromorphological degradation through the straightening, deepening and widening of the river, the installation of on line silt ponds and also a large length of the river has been culverted. It mentioned the impact of these modifications to fisheries waters, and that it has resulted in a complete loss of all fisheries habitat and a barrier to fish migration. IFI requested restoration works be carried out on the culverted channel, the use of the on line silt ponds to cease and that habitat restoration of this important watercourse be facilitated. IFI also noted concerns around the introduction of non-native fish species.

A response letter was issued to IFI on the 5th May 2022 stating that the issues raised in relation to the Figile River, located immediately downstream of the proposed development, relate to previous and current activities on the peatland areas and a separate project (Timahoe South Bog Rehabilitation Plan[2]) is underway to address the rehabilitation of the Timahoe South Bog outside of the proposed development boundary (these issues are identified and addressed in the project's Natura Impact Statement[3]). It also stated that, notwithstanding the above, a full suite of aquatic surveys, both within and downstream of the proposed development, will be undertaken to inform the EIA. In addition, stringent mitigation measures will be implemented and have been outlined within the EIAR and NIS which will ensure the protection of the Cushaling River during all works associated with the proposed development.

In addition, a site meeting was held between IFI, Bord na Móna and TOBIN (Sinead O Reilly) on the 10th January 2023, to discuss IFI's concerns around the current quality of the Cushaling River and anticipated impacts from the proposed development. During the meeting, all mitigation measures which will be implemented during all phases of the development were discussed, and emphasis was made on how the measures will ensure the protection of the watercourse and fisheries.

3.4 Desktop Study and Information Sources

A desktop study was undertaken to inform this screening assessment. The desktop study comprised a review of the following key datasets and information sources:

[2] Accessed [December 2022] via https://www.bnmpcas.ie/wp-content/uploads/sites/18/2022/10/Timahoe-South-Rehab-Plan-_Final-v5.pdf
[3] Accessed [December 2022] via https://www.bnmpcas.ie/wp-content/uploads/sites/18/2022/10/BnM_1507C_Timahoe-South_NIS_Final_290822.pdf

- Identification of European sites within the Zone of Influence (ZoI) of the proposed development area through the identification of potential pathways/links from the proposed development area and European sites and/or supporting habitats.
- Review of the National Parks and Wildlife Service (NPWS) site synopsis, Natura 2000 data forms and Conservation Objectives for European sites identified through potential pathways from the proposed development (Accessed [April 2023] via https://www.npws.ie/protected-sites).
- NPWS datasets on Annex I habitats and Annex II species (Accessed [April 2023] via https://www.npws.ie/protected-sites).
- Review of available literature and web data. This included a detailed review of the NPWS and National Biodiversity Data Centre (NBDC) websites including mapping and available reports for relevant sites and in particular Qualifying Interests and Special Conservation Interests described and their Conservation Objectives.
- Review of Inland Fisheries Ireland (IFI) research data.
- Water Framework Directive (WFD) website: (Accessed [April 2023] via https://www.catchments.ie/guide-water-framework-directive/).
- GSI Online mapping: (Accessed [April 2023] via http://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228).
- Environmental Protection Agency (EPA) Mapping database: (Accessed [April 2023] via https://gis.epa.ie/EPAMaps/AAGeoTool).
- A review of Conservation Objective Documents, Supporting Document and the Natura 2000 – Standard Data Forms for the following sites was undertaken:
  - River Barrow and River Nore SAC (IE0002162)
  - River Boyne and River Blackwater SAC (IE002299)
  - River Boyne and River Blackwater SPA (IE004232)
- Review of previous ecological assessments undertaken within the area was carried out and included, but not limited to the following documents:
  - Bord na Móna (BnM) (2022) Timahoe South Bog – Cutaway Bog Decommissioning and Rehabilitation Plan 2022. (Unpublished Report).
  - TOBIN Consulting Engineers (2017) Proposed Development at Drehid Waste Management Facility. Environmental Impact Assessment Report. Volume II.
  - TOBIN Consulting Engineers (2012) Drehid mechanical Biological Treatment Facility Environmental Impact Statement, Volume II. Bord na Mona.

In addition, aerial photography (Google Maps, Bing Maps) and mapping (Ordnance Survey of Ireland, Geological Survey of Ireland) were used to identify non-designated habitats such as rivers, woodlands, and hedgerows of local ecological importance.

3.5 Field Surveys

Multidisciplinary ecological field surveys were undertaken by skilled and appropriately experienced TOBIN ecologists on the 26th January, and 4th and 5th May 2022. The ecological surveys that were carried out are relevant to the consideration of the potential for the proposed development to affect the conservation objectives of the European sites in the vicinity of the proposed development, namely: habitat/botanical survey, otter survey and river assessment survey, all of which described hereunder. While additional ecological surveys were undertaken, they are not specifically relevant to this Screening Assessment. See the Environmental Impacts Assessment Report (EIAR) (contained within the Planning Application) for full details of all ecological surveys undertaken within the proposed development site.

3.5.1 Habitat and Flora Survey

Habitat and botanical surveys were carried out within the proposed development site on the 4th and 5th May 2022, following methodology outlined by *'Best Practice Guidance for Habitat Survey and Mapping'* (Smith et al., 2011) and '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*' (NRA, 2008). The data was recorded, and the habitats encountered during the site visit were classified in accordance with Fossitt (2000) with reference made to the '*Interpretation Manual of EU Habitats*' (EC, 2013) as appropriate. Reference was also made to guidance within the Cross & Lynn (2013) and Smith & Crowley (2020) documents.

The proposed development site was surveyed for protected flora and fauna and any evidence of EU Habitats Directive Annex I habitats. The proposed development site was also searched for evidence of invasive plant species listed in Part 1 of the Third Schedule of S.I No. 477 of 2011, European Communities (Birds and Natural Habitats) Regulations (2011). The findings of the surveys were used to inform this assessment.

3.5.2 Fauna survey

A terrestrial mammal survey was carried out in line with guidance outlined in the NRA (2008) Guidance: *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*. Any evidence of Annex II species listed on the EU Habitats Directive (92/43/EEC) and Annex I bird species listed on the EU Birds Direct (2009/147/EC) was used to inform this assessment. Target survey for specific protected species was also undertaken and is discussed hereunder.

Otter

Otter surveys were undertaken along waterbodies (which included rivers, lakes, ponds and drainage ditches) within the proposed development site plus a 150 m buffer of the site, to account for noise disturbance impacts, following methodologies outlined within the NRA (2006) guidelines; and Chanin (2003) '*Monitoring the Otter Lutra Lutra'*. Any evidence of otter such as tracks, spraints, couches, slides, feeding remains or holts, were recorded.

Birds

Ornithological activity was surveyed within the proposed development site following the Countryside Bird Survey guidelines CBS Manual, '*Guidelines for Countryside Bird Survey Participants*' (CBS, 2012). All birds' activity noted during the two walkover surveys (which were undertaken in winter [26th January] and within the breeding season [4th May]) was recorded.

The surveyors walked along transects, birds were identified by sight and call and the location and activity were recorded using the British Trust for Ornithology species and activity codes[4]. Due to the small size and location of the proposed development site, and lack of suitable favourable nesting and roosting habitat such as hedgerows, treelines and wetlands, a single winter and breeding bird survey were considered sufficient to establish usage of the site by breeding and wintering birds. In addition, a robust desktop assessment of previous bird surveys undertaken within surrounding lands was also conducted to further inform the assessment.

Marsh Fritillary

[4] https://www.bto.org/our-science/projects/bbs/taking-part/download-forms-instructions

Targeted marsh fritillary (*Euphydryas aurinia*) surveys were also undertaken within the proposed development site following methodologies outlined in the NRA (2008) guidance. The survey included a search of suitable habitat for marsh fritillary, which is largely dependent on the presence of devil's bit scabious (*Succisa pratensis*), the species main food source (Phelan et al., 2021).

Aquatic Surveys

A baseline aquatic ecological assessment was carried out on the Cushaling River (Figile_010), immediately downstream of the proposed development. Four survey sites were, where feasible, selected relevant to the proposed works area. Sites were selected based on their location within and outside the proposed development site boundary, available access, previous Q-Value Status from Environmental Protection Agency (EPA) surveys, and stream order, giving a good representation of the overall aquatic ecology throughout the study area. The selection of the sampling sites also depended on the presence of riffle/ glide habitat from which samples could be collected. The sites were also deemed suitable based on suitable access available and where the river was wadable to allow for an aquatic habitat assessment and macroinvertebrate survey to be carried out. This enabled a good representation of the overall aquatic ecology within the study area. This assessment was carried out on 4th of May 2022. The locations of the survey sites are illustrated on

Figure 3-1 and the coordinates are listed in Table 3-1 below.

The surveys included an aquatic assessment of the riverine habitat available to support fish and aquatic species, an assessment of the macroinvertebrate community and an analysis of the biological water quality of the watercourse. The purpose of the surveys was to assess the overall aquatic habitat value of the river downstream of the proposed development, and establish the importance of the Cushaling River downstream of the proposed development for fish species of conservation importance such as Atlantic salmon (*Salmo salar*), lamprey (*Lampetra spp.*) and white-clawed crayfish (*Austropotamobius pallipes*).

Aquatic Habitat Assessment

The aquatic ecological assessment included a habitat assessment of the receiving watercourses within the study area. The habitat assessment of the watercourses followed methodologies outlined in the Environment Agency's Guidance "(EA, 2003) and the Heritage Council Guidance (Fossitt, 2000).

The riverine habitat was also assessed for its suitability to support protected aquatic species. A broad appraisal / overview of the upstream and downstream habitat at each site undertaken to evaluate the wider contribution to salmonid and lamprey spawning, assess if the water course could support salmonids and access the general fisheries habitat.

The surveys were undertaken to characterise the fisheries importance of the stream and connecting drainage channels to establish suitability for Atlantic salmon, lamprey and brown trout (*Salmo trutta*). These species are the only fish of conservation value that were considered likely to be present within the small and heavily modified channels in the study area. The surveys would help identify the presence of habitats capable of supporting the aforementioned species.

River habitat surveys and fisheries assessments were carried out utilising elements of the approaches in the River Habitat Survey Methodology (Environment Agency, 2003) and Fishery Assessment Methodology (O'Grady, 2006) and '*Ecology of the Atlantic Salmon'* (Hendry & Cragg-Hine, 2003). to broadly characterise the river sites (i.e. channel profiles, substrata etc.).

An evaluation of potential lamprey habitats within the study area was made with reference to methodologies outlined in *'Ecology of the River, Brook, and Sea Lamprey'* (Maitland, 2003) and also NPWS Irish Wildlife Manuals lamprey surveys (O'Connor, 2004; O'Connor, 2006; and O'Connor, 2007). An assessment of the habitat to support white-clawed crayfish was also undertaken following methodologies outlined in '*Guidance on Habitat for White-clawed Crayfish*' (Peay, 2002).

All sites were assessed in terms of:

- Stream width and depth and other physical characteristics.
- Substrate type, listing substrate fractions in order of dominance, i.e. bedrock, boulder, cobble, gravel, sand, silt etc.
- Flow type, listing percentage of riffle, glide and pool in the sampling area.
- In-stream macrophyte, bryophytes occurring and their percentage coverage of the stream bottom at the sampling sites.
- Riparian vegetation composition.

Each sampling site along the watercourse was described in terms of the important aquatic habitats and species recorded (i.e. based on their conservation value). This determined the ecological evaluation of each aquatic survey site and informed site-specific mitigation for the proposed development. Watercourse characteristics including bankside vegetation, substrate and flow rate were recorded onsite. A number of physical habitat variables were measured at each site. These included the percentage of overhead shade present, percentage of substrate type and instream cover, bank height and bank width. The percentage of riffle, glide and pool was also measured over each site surveyed.

At the four suitable sampling sites, the biological water quality was assessed by the Q-scheme index methodology, following the Standard Operating Procedures of the EPA (2020), and Small Streams Risk Score (SSRS – Walsh, 2005). At each site, notes on the physical habitat were recorded. A semi-quantitative, two-minute macroinvertebrate kick-sample was collected from the riverbed, with the aim of targeting faster flowing riffle habitats where possible. A further one-minute hand search was carried out to locate macroinvertebrates that may have remained attached to the underside of the cobbles if possible. This sampling approach is sufficient to achieve a suitable representation of taxa for bioassessment. Due to the substratum (e.g. bedrock), flow conditions and heavy sediment present, it made kick-sampling difficult, and the abundance of macroinvertebrates collected was extremely low. It was necessary to spend a longer amount of time sampling the river to accumulate a sufficient diversity and abundance of macroinvertebrates. This sampling approach requires avoidance of obvious localized disturbance (e.g. cattle access points) which may adversely influence the sample taken. However, due to difficult access points along the river, one sampling site was taken at a cattle access point. This site is also an EPA sampling site.

The species assemblage list was used to assign a Biotic Index value (Q-Value, SSRS) to the sampled stream. It involved recording the taxa present at a suitable and attainable taxonomic resolution (i.e. genus or species) and their categorical relative abundance, determined using approximate counts. Once all taxa and their relative abundance were recorded, the sample was returned to the river.

Table 3-1: Locations of Survey Sites along the Cushaling River

Site Number	River	Distance Downstream of the Proposed Development Site	ITM (x)	ITM (y)
Site 1	Cushaling River	ca. 425 m	673504	730820

Site Number	River	Distance Downstream of the Proposed Development Site	ITM (x)	ITM (y)
Site 2	Cushaling River	ca. 1.4 km	672902	731334
Site 3	Cushaling River	ca. 2.5 km	671810	731318
Site 4	Cushaling River	ca. 2.8 km	671496	731247

Figure 3-1: Aquatic Sampling Sites

3.6 Statement of Competence

This report was prepared by Áine Sands B.Sc. (Hons), Senior Ecologist with TOBIN. Áine has seven years post-graduate experience in ecology and environmental consultancy. Áine has predominantly been involved in large public and private infrastructure projects where she has carried out numerous Screenings for Appropriate Assessments, Natura Impact Statements and Ecological Impact Assessments for proposed developments. Áine has a strong understanding of National and European legislation associated with biodiversity and is cognisant of relevant rulings by the Court of Justice of the European Union (CJEU). Áine also has experience with undertaking ecological surveys for protected habitats and species.

In addition, Sinead O'Reilly (M.Res.) undertook the aquatic surveys and contributed to the chapter. Sinead O'Reilly is a Senior Ecologist with TOBIN Consulting Engineers. She holds an honours degree in Zoology from University College Dublin and Research Masters in Science in Freshwater Ecology from University of Glasgow. She is a qualified and experienced environmental consultant with twelve years' post-graduate experience in freshwater sciences and environmental consultancy in Ireland. Sinead has prepared and delivered annual research reports, research papers, Appropriate Assessments, Natura Impact Statements, invasive species reports, mammal survey reports and other relevant documents. Sinead has a strong technical background as a freshwater ecologist and has extensive field experience in all freshwater habitats across Ireland.

This chapter was senior reviewed by Joao Martins B.E. (Hons) M.Sc., Senior Ecologist with 13 years' relevant professional experience in freshwater ecology including monitoring of both lotic and lentic systems. Mr. Martins has extensive experience of preparation of screenings for Appropriate Assessment (AA), Natura Impact Statements (NIS), Ecological Impact Assessments (EcIA) and Environmental Impact Assessment Reports (EIAR). He additionally has specific field survey experience of Invasive Alien Plant Species, Bat Activity, Habitats, Mammals, amongst others.

4.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

4.1 Site Location

The Bord na Móna property, as outlined in blue in Figure 4-1 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 4-1 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 existing and operational waste management facility at Drehid (which is described in section 4.2) 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. 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 4-1.

4.2 Existing Infrastructure

The proposed development 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 (Section 4.2.1 and Section 4.2.2). 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 4-1 below.

The 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 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 ESB 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.

4.2.1 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 (or cells) 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 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.

4.2.2 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 (93.35 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.

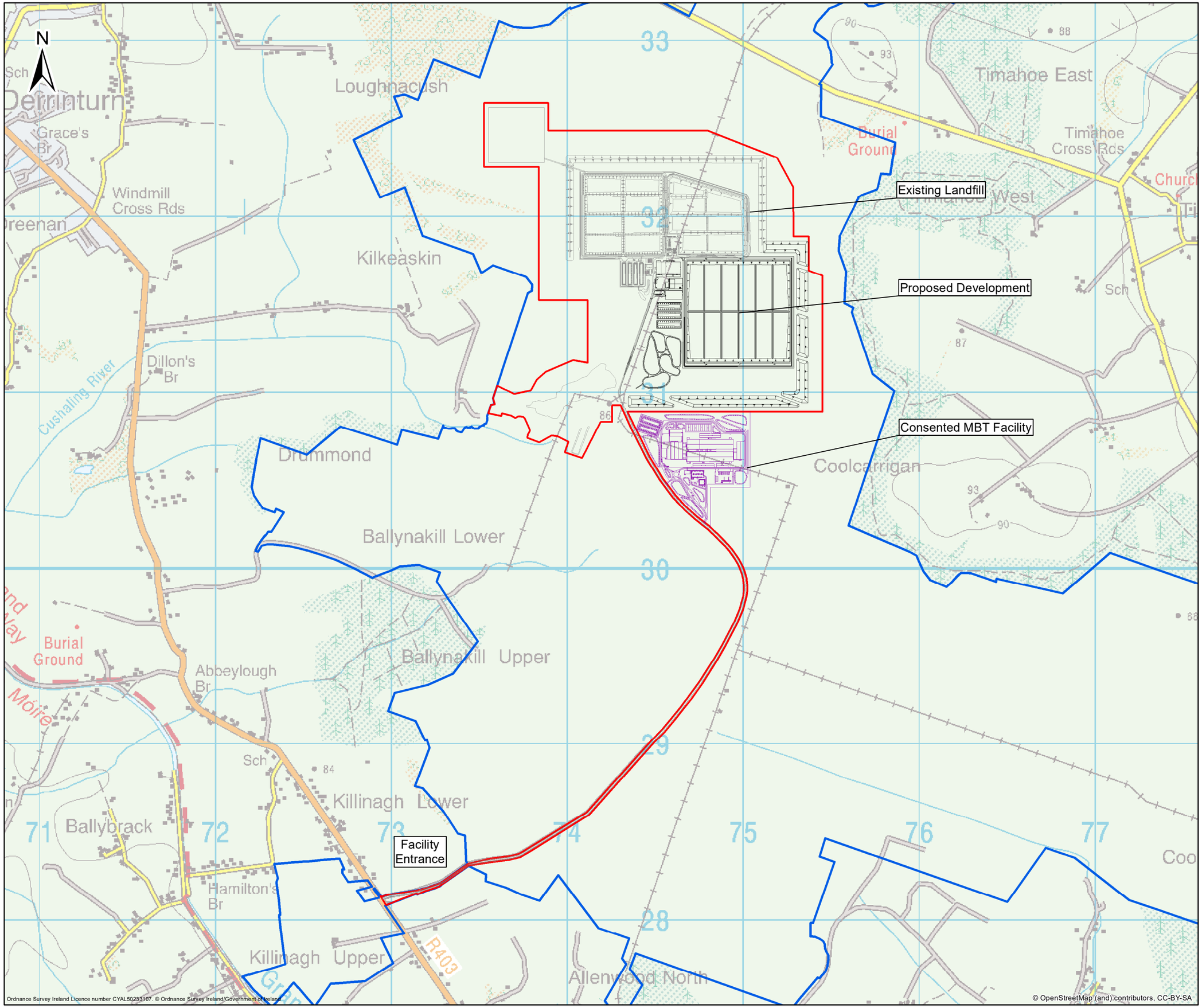
The composting facility provides for the biological treatment of organic fines and source separated organic waste. Organic fines are generated from the pre-treatment and screening of MSW and primarily comprises organic material in the form of food and garden waste. Source separated organic waste arises 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.

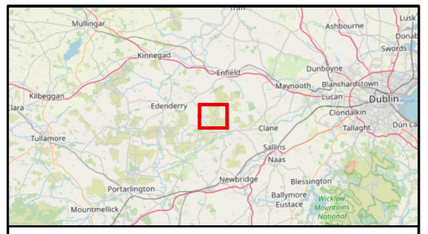
4.2.3 Permitted Mechanical Biological Treatment (MBT) Facility

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 License 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 4-1.





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.
D01	09/05/2023	Draft 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

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Draft: D01

Figure 4-1

4.3 Details 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.

Table 4-1 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 4-1 are for the entire Drehid WMF, incorporating the existing permitted infrastructure. No additional waste, above the quantities set out in Table 4-1, will be taken in at the Drehid WMF.

Table 4-1 – 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 4.3.4. 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 Table 4-1 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 (<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 either the existing composting area or the new composting area with the biostabilised output being disposed of to the landfill.

The proposed new processing building for the screening and segregation of non-hazardous soils, stones and C&D waste 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 confined building. The screened and sorted materials will be reclassified as non-waste materials subject to compliance with End-of-Waste criteria and can be utilised at the landfill for road construction, tipping platforms and capping. The use of recovered 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.

4.3.1 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 4-2. This further capacity will be provided by way of new landfill infrastructure at the location as shown in Figure 4-1 above.

Table 4-2: Nature and Quantity of Waste for Acceptance 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)Non-Hazardous C&D and Municipal Waste, comprising: • Non-hazardous soils and stones, C&D rubble and C&D fines • Residual Municipal solid waste (rMSW) • Incinerator bottom ash (IBA)	250,000	25 years
Biostabilised waste and residual 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 total biostabilised waste output from the existing compost facility, increase in existing compost facility throughput and the adjacent MBT facility.*

In addition to the quantities set out in Table 4-2 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 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 in the new landfill 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 m3 (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 new landfill.

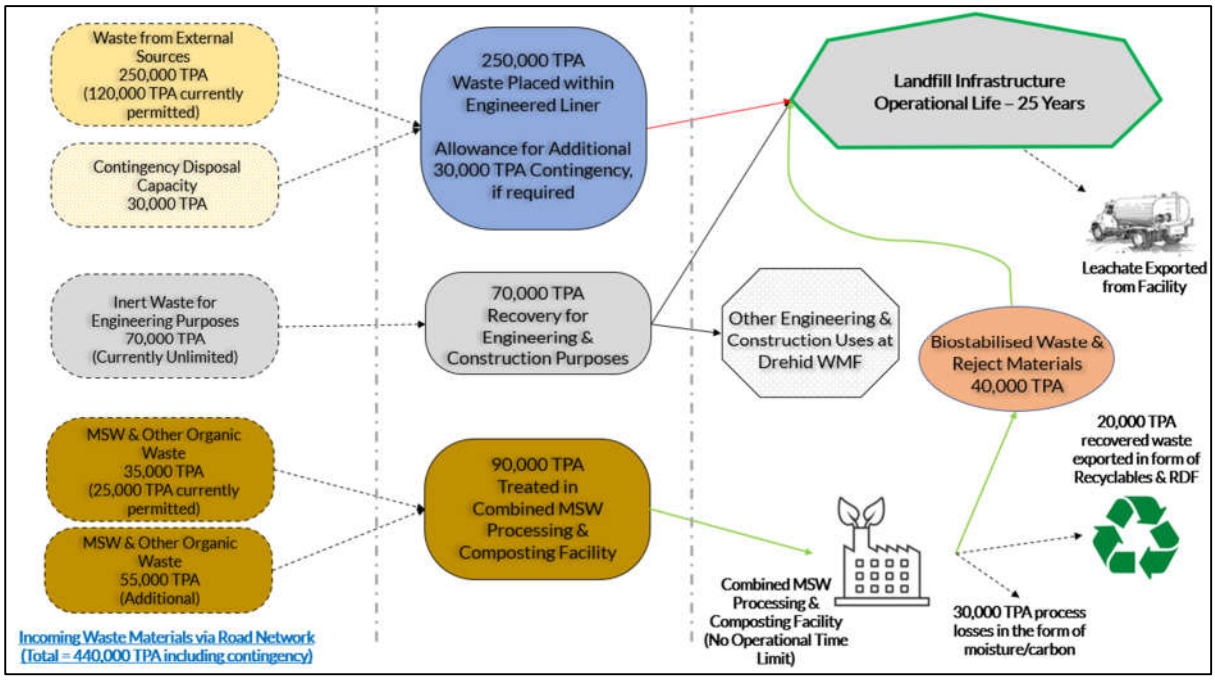
The landfill has been designed with a void space capacity of 7,250,000 m^3 which provides a buffer capacity for variances in waste density and the potential utilisation of contingency capacity during the lifetime of the facility. From discussions with the RWMPO's, it is not anticipated that the contingency 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 Table 4-1 and Table 4-2, 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 waste outputs 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 4.3.2 and 4.3.3). 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.

Figure 4-2 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 (ca. 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 4.3.5.

Figure 4-2: Flow Diagram of Material Movement 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. The capping will be graded down 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 included in Appendix 1 of this report.

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 4.3.5. Details on the leachate collection infrastructure within the landfill are provided in Section 4.3.9.7. 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 which in contained in Appendix 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.

4.3.1.1 Landfill Disposal Contingency

Bord na Móna and their consultants held pre-application consultation discussions with the Regional Waste Officers 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 RWMO'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 Officers outlined that they would be seeking to have 10% of the landfill disposal capacity held as contingency in any given year. This equates to c. 30,000 tonnes of non-hazardous waste, based on the capacity set out in Table 4-2 (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.

4.3.2 Increased Compost 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.

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.

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.

As part of the processing of MSW, 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. 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.

4.3.3 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 Compost 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.'s 11290-2081 contained in Appendix 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. 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 5.5m 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.

These 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 4.3.2.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.

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 contained in Appendix 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 mat 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.

4.3.4 Waste Composition

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

4.3.4.1 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 NIS 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 he 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.

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

<u>C&D fines and C&D rubble:</u>

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)[5] 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 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 Compost Facility will be separate from the rMSW accepted for landfilling. The MSW incoming for processing will not have been subject to

[5] 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))

pre-treatment and will be treated at the facility The Waste Acceptance Procedure 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 will be accepted at the new landfill, will include non-hazardous waste from unauthorised/illegal landfill remediation and non-hazardous repatriated waste.

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.

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.

<u>Other Non-MSW Waste:</u>

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.

<u>Incinerator Bottom Ash:</u>

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[6] 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

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

(AT_4) is <7mg 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 accepted from external sources such as other compost or MBT facilities subject to meeting the above referred criteria.

Inert 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 material for these engineering purposes within the engineered liner is required. C&D fines and rubble are commonly used for this purpose and are defined as inert waste. The use of this inert waste for engineering purposes avoids the import of virgin non-waste quarried aggregates and therefore the use of inert waste 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.

4.3.4.2 Composting

Waste accepted for composting will be of an identical nature to the waste currently accepted at the compost 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.

Organic fines are the organic element of municipal solid waste (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 municipal solid waste following an initial course shredding process. The organic quality of organic fines 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 0f 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 Compost 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. This has been discussed with the relevant inspectors from DAFM and no concerns on the proposed waste intake increase have been raised.

4.3.4.3 MSW Processing

The new MSW Processing infrastructure will have the 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 BnM 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 Station across the country.

4.3.5 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.

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. 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

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[7]. 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 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 will be approx. 40,000 TPA. Upon cessation of landfilling activity at the proposed development (25 years from

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

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.

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.

4.3.6 Proposed Site Infrastructure

Section 4.3.1, 4.3.2 and 4.3.3 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.

4.3.6.1 Soils & 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. This building will be used for the acceptance, screening and temporary storage of waste soils & 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 contained in Appendix 1. This infrastructure will be developed over time as required and the provision of this processing facility to enable reclassification 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[8] 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.'s 11290-2085 contained in Appendix 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.

4.3.6.2 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 contained in Appendix 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.

As per Section 4.3.6.1, 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

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

during machinery maintenance or servicing activities. A vehicle wash bay area including 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.

4.3.6.3 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 in Appendix 1.

4.3.6.4 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.

4.3.6.5 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.

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 contained in Appendix 1.

4.3.6.6 Site Roads and Parking

An additional lane will be provided on the existing access road for incoming traffic as shown on Drawing No. 11290-2048 contained in Appendix 1.

New internal roads will be provided as shown on Drawing No. 11290-2045 contained in Appendix 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 full retention fuel/oil interceptor.

4.3.6.7 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 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. This runoff will pass through a grit interceptor and Class 1 fuel/oil interceptors, 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 113.59 l/s.

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. 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. 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 Appendix 1.

4.3.6.8 Integrated Constructed Wetland

Outfalls from the surface water lagoons will then be diverted to an Integrated Constructed Wetland (ICW) area via drainage pipes as shown on Drawing No. 11290-2014 contained in Appendix 1. The ICW forms the final treatment step for surface run-off from the proposed development and forms part of the proposed development. The ICW has been designed by VESI Environmental, who are specialists in this field.

The ICW which will contain four cells and will be heavily vegetated with native aquatic plant species, before discharging into the existing drainage network at the western boundary of the proposed development site. The ICW will provide further treatment of the stormwater using a natural biological, chemical and physical process of sediment and pollutant removal, which ultimately reduces the relative mass loadings to the receiving drain. The design of the ICW is based on a total influent volume of 9797.76 m^3 per day. An existing surface water drain located immediately south of the proposed development will receive the treated storm water from the ICW, then discharging into the Cushaling River. The ICW configuration and discharge to the existing surface water drain are optimised for gravity flow. The parameters of the ICW effluent are outlined in Table 4-3: below.

Table 4-3: Discharge consent and expected treatment performance

Parameter	Discharge consent limits (current)	Expected ICW effluent
Solids	35 mg/l	<20mg/l
BOD	25 mg/l	5mg/l
NH4	0.5 mg/l	<0.14mg/l

Table 4-4 below provides additional values for the performance for the proposed ICW.

Table 4-4: Average sampling values for example ICW

	Inlet	Outlet
Average	0.19	0.04
Max	2.12	0.53
Min	0.01	0.01
SD	0.33	0.08
n	71	71
No. < 0.14	48	67
No. < 0.5		70

4.3.6.9 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 4.3.6.10.

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. 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. 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 contained in Appendix 1 and also shows the location of the proposed new underground primary treatment system.

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 contained in Appendix 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.

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.

4.3.6.10 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 4-1. An additional 200 m^3 GRP tank will be installed within this bund at the location as shown on Drawing No.

11290-2010 contained in Appendix 1, to facilitate storage of additional leachate generated from the new landfill as well as additional sanitary wastewater.

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. 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.

4.3.6.11 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 contained in Appendix 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 contained in Appendix 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.

4.3.6.12 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.

4.3.6.13 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.

4.3.6.14 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

contained in Appendix 1. These proposed works will be carried out in agreement with and to the standards required by the ESB.

4.3.7 Operational Phase Activities

4.3.7.1 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. 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.

4.3.7.2 Site Access

Access to the proposed development will be via the existing permitted site entrance, located on the R403 Regional Road. The existing access comprises a T-junction from the R403 to a dedicated entrance to the Drehid WMF. The site access is controlled using metal gates and is monitored by security from the weighbridge kiosk.

From the entrance gate, access to the waste facility is via an existing 4.8 km two-lane private access road. This access road will only be used by vehicles travelling to and from the Drehid WMF, including 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, Soil 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.'s 11290-2045 which are contained in Appendix 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.

4.3.7.3 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

4.3.7.4 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 BnM 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.

4.3.7.5 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.

4.3.7.6 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 contained in Appendix 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.

4.3.7.7 Water Supply

The requirements and proposed source of water for the various elements of the proposed development are identified in Table 4-5.

Table 4-5: Water supply requirements

Water Requirement	Source
Potable water	Water dispensers (imported 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 contained in Appendix 1.

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[9].

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. Fire hydrants, to comply with the requirements of the Building Regulations - – Technical Guidance Document B (Fire Safety), will be located on this fire watermain.

4.3.7.8 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 4.3.14.5.

The estimated usage of diesel fuel, hydraulic oil, electricity and water is outlined in Table 4-6. 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 4-6: 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

4.3.8 Nuisance Controls

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 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.

[9] "Site Development Works for Housing Areas"

4.3.9 Details of Additional Landfill Capacity

4.3.9.1 Phasing of the Landfill

The proposed landfill infrastructure, as outlined on Drawing No. 11290-2003 and 11290-2010 which are contained in Appendix 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. 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.

Prior to the construction of the landfill, all vegetation will be cleared, and the ground will be stripped of peat and topsoil. The floor of the landfill will be graded in accordance with the required formation levels as shown on Drawing No. 11290-2011.

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, 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. Following final capping each phase will be allowed to recolonise with natural peat tolerant plant species.

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 4-7 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.

Table 4-7: Estimated 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

4.3.9.2 Basal Lining System

4.3.9.3 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 topography, to the formation levels shown on Drawing No. 11290-2011 contained in Appendix 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 contained in Appendix 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 x 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.

4.3.9.4 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. 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.

4.3.9.5 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 BnM 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.

4.3.9.6 Landfill Liner Materials Balance

The estimated material quantities required for construction of the new landfill are set out in Table 4-8. 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 4-8: Estimated material quantities for construction of new landfill

Item	Material	Quantity	Source
Material for landfill embankment construction	Compacted suitable subsoil materials	282,000 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
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 4.3.4or 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 282,000 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 4-7 gives an indicative schedule for construction of each phase.

An estimated 1,200,000 m^3 (including approx. 506,000 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.

4.3.9.7 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 contained in Appendix 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.

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 4.3.5) 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.

4.3.9.8 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 which are contained in Appendix 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 contained in Appendix 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 is saturated water, 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 contained in Appendix 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, BnM 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.

4.3.10 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 4.3.9.7 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 4.3.5.

4.3.10.1 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 (2000) 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:

$$L0 = [ER(A) + LW + IRCA + ER(I)] - [aW]$$

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)
I = 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 4.3.9.1, 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 4-9.

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 4-9 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 4-9: Estimated average leachate generation rates for the proposed new landfill

Year	Annual Leachate Volume (m3)	Daily Leachate Volume (m3)	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

Year	Annual Leachate Volume (m3)	Daily Leachate Volume (m3)	Years of Generation
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
2026 NOTE 1	863	4.7	1

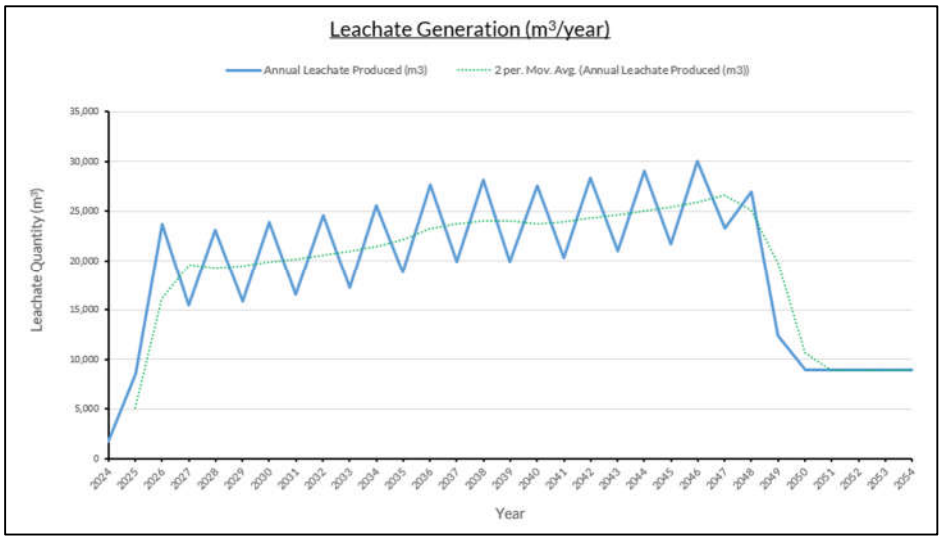
NOTE 1 Placement of waste and therefore leachate generation is expected to commence in Q1 2026.

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 4-9

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

Table 4-6 shows the trend of leachate generation over this time.

Figure 4-3: Estimated trend in leachate generation



4.3.10.2 Composition of Leachate

Leachate quality depends on several parameters most notably[10]:

[10] EPA *Landfill Site Design Manual*

- 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. 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.

4.3.10.3 Leachate Collection and Removal

Leachate collection within the waste body is described in Section 4.3.9.7. 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 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 Table 4-1.

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 4.3.5 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.

4.3.11 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.

- 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 60,000 TPA MSW intake and 30,000 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.

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 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 4.3.4.2).

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 4-4) 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 4-4: 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 4-5), 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 4-6) 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 4-5: Example of a low-speed shredder

Figure 4-6: 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 4-7) 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 4-7: 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.

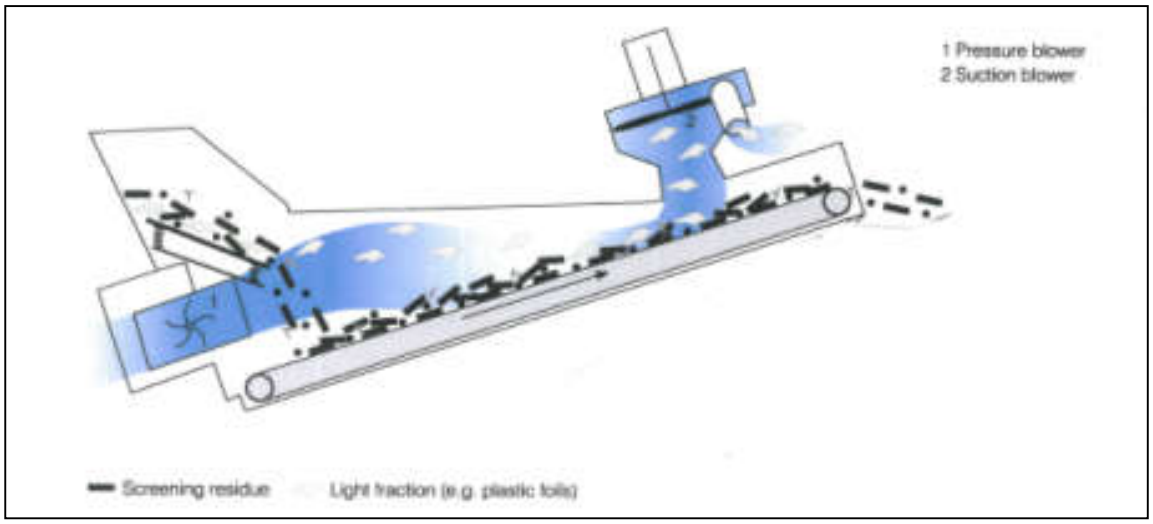
- The screening process produces two fractions:
- In the case of organic fines feedstock:
  - <30mm
  - >30mm
- In the case of source separated bio-waste feedstock:
  - <12mm
  - >12mm

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 4-8.

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 4-8: 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 70oC 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 contained in Appendix 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 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 contained in Appendix 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 contained in Appendix 1. The stacks will have a circular profile with an exit diameter of 1.1 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.

4.3.12 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.

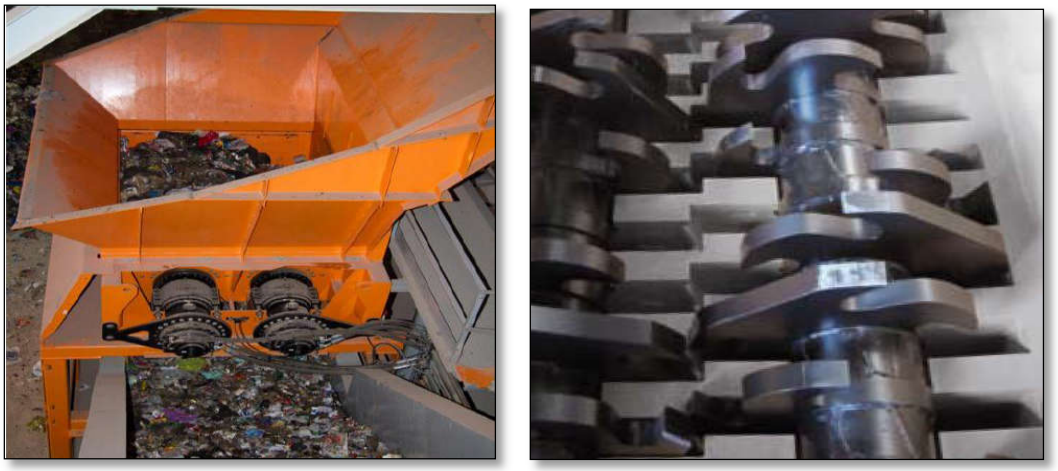
Waste received on the tipping floor is either moved to dedicated storage areas by loading shovel operating in the reception area or is fed directly to the shredder/mixer hopper. Concrete walls in the reception area facilitate material handling while a drainage system collects run-off and directs it to the plant leachate holding tanks. Regular washdown procedures 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 4-9) 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 4-9: 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.

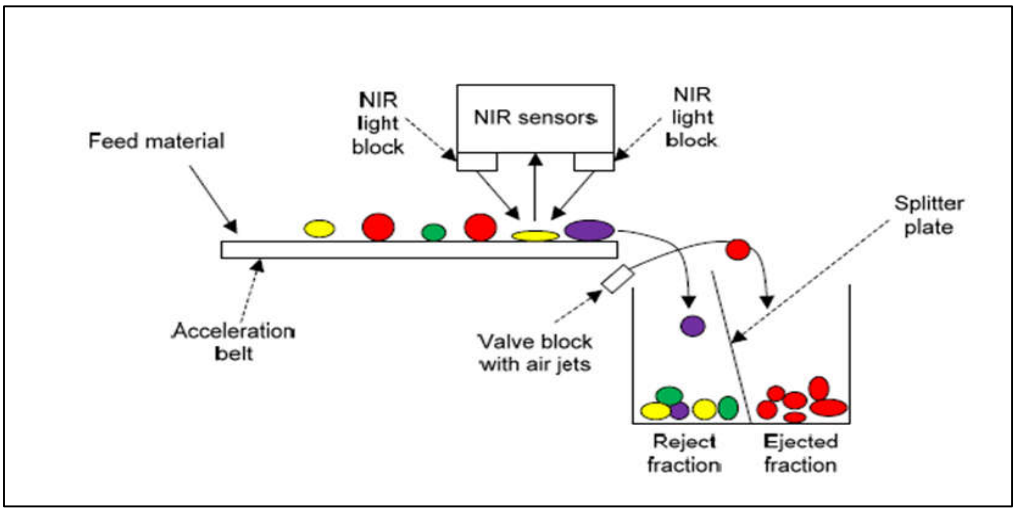
Waste Processing

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 4.3.4. These organic fines material will be collected and transferred by loading shovel to the composting tunnels for further treatment.

The remaining oversize fraction will be subject to further processing to remove plastics using near infrared (NIR) optical sorting technology (Figure 4-10). 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 4-10: 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.

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.

4.3.13 Construction Phase Activities

4.3.14 Construction Programme and Sequencing of the Development

On receipt of a successful Grant of Planning Permission, pre-construction works will commence at the site. For the purposes of this AA Screening report 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 4-11 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 4-12 illustrates the gradual development of the landfill footprint from the initial construction works and through each of the subsequent landfill phases.

Figure 4-11: Outline programme for the construction of the Proposed Development

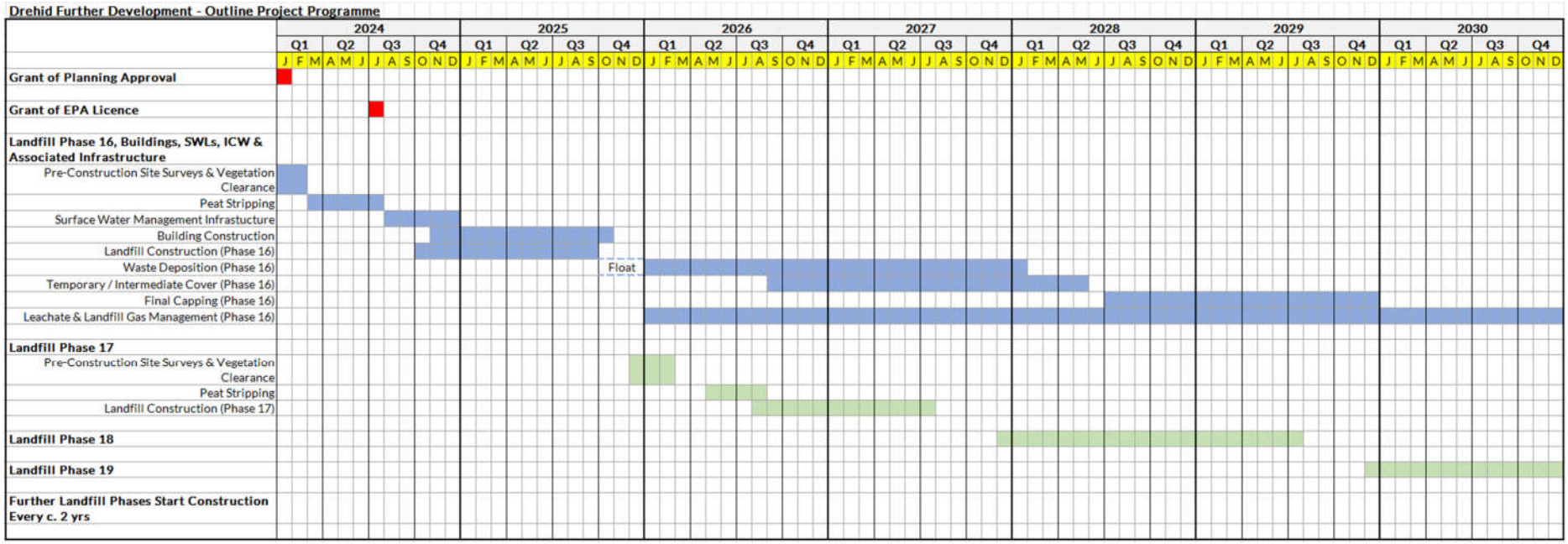
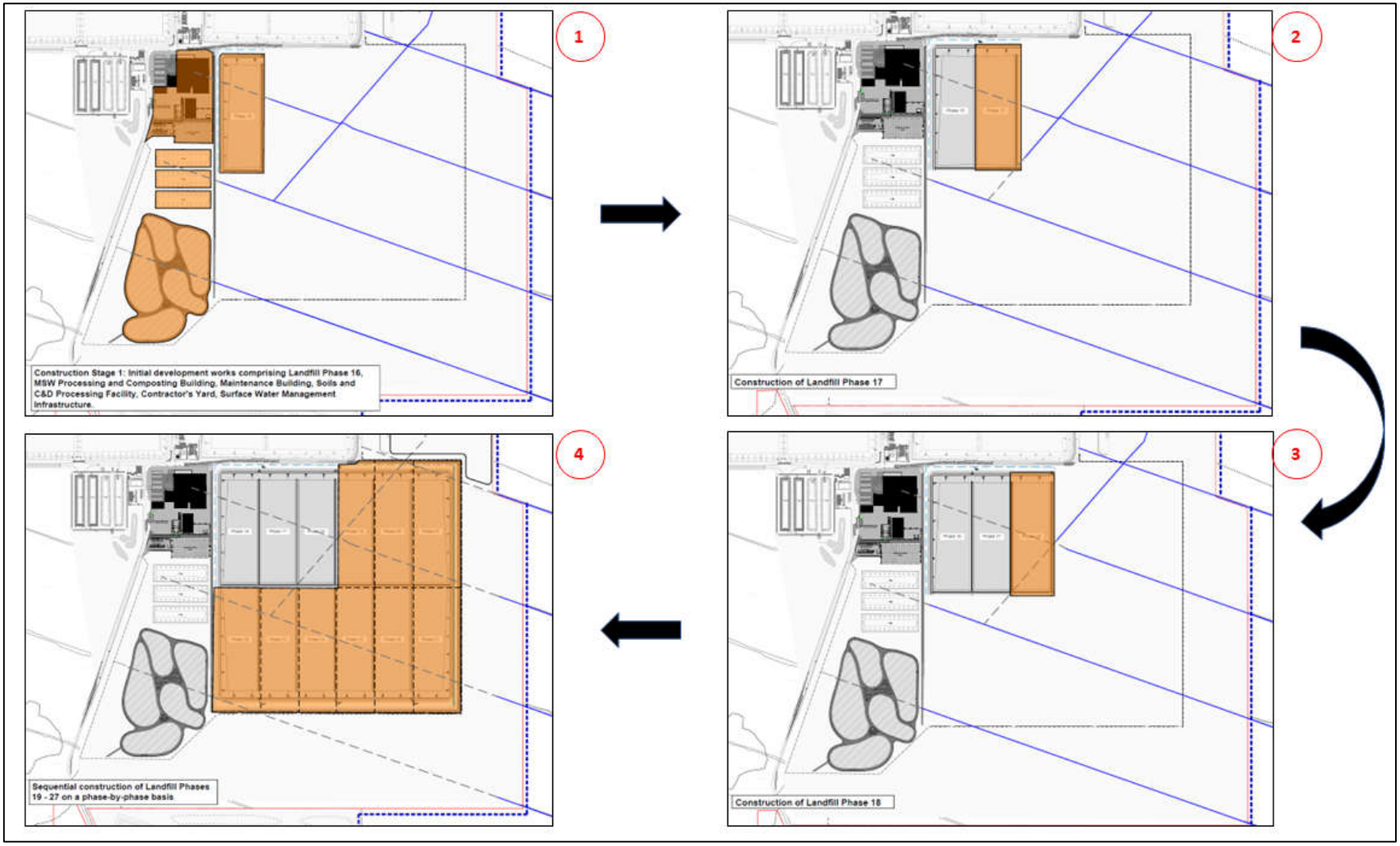


Figure 4-12: Illustration of the gradual development of the proposed infrastructure



4.3.14.1 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.

4.3.14.2 Site Clearance, Drain Blocking and Peat Stripping

Site clearance and peat stripping will involve the use of excavators specifically designed with wide tracks to operate in peat 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, 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.

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.

4.3.14.3 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 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 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). 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.

4.3.14.4 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 4.3.9.3.

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.

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.

4.3.14.5 Excavated Materials Balance

The excavated materials that are estimated to be generated during the construction phase are presented in Table 4-10 along with the estimated fill volumes.

Table 4-10: Cut and fill material estimates

Material	Excavation Estimate (m3)	Fill Estimate (m3)
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 will be reused for construction of environmental screening berms and landscaping at the facility at locations as shown in Drawing No. 11290-2010 in Appendix 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 linear 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.

4.3.14.6 Construction Compound

The proposed development includes a dedicated Contractor's Compound at the location as shown on Drawing No. 11290-2010 included in Appendix 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.

4.4 Decommissioning Phase Activity

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. 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.

5.0 DESCRIPTION OF THE RECEIVEINGENVIRONMENT

The findings of the desktop study and field surveys of the receiving environment are summarised hereunder.

5.1 Habitat and Flora

During field surveys, all habitats within the proposed development site were classified according to Fossitt (2000). The habitats within the proposed development footprint are described herein.

5.1.1 Cutover bog (PB4)

The majority of the proposed development site comprises re-vegetated cutover bog. The proposed development site was previously used by BnM up to approximately 35 years ago for production of sod peat for energy generation. Peat production then ceased onsite, with no peat extraction taking place. The areas of bare peat have been slowly recolonised with vegetation overtime.

The majority of the cutover bog habitat was dry with no sphagnum mosses (*Sphagnum* spp.) present. However, areas of pooling were recorded, predominantly towards the southern boundary of the proposed development site. The habitat was dominated with ling (*Calluna vulgaris*), immature downy birch (*Betula pubescens*) and purple moor-grass (*Molina caerulea*). With frequent soft rush (*Juncus effusus*), stika spruce (*Picea sitchensis*), dandelion (*Taraxacum vulgaria*) and bog cotton (*Eriophorum angustifolium*), and occasional tormentil (*Potentilla erecta*), gorse (*Ulex europaeus*), heath milkwort (*Polygala serpyllifolia*), wild strawberry (*Fragaria vesca*), common dog violet (*Viola riviniana*) and sweet vernal-grass (*Anthoxanthum odoratum*). Small pools and wetter areas were present in areas of the cutover bog habitat. In the wetter areas, clumps of sphagnum mosses (*Sphagnum* spp.) were present.

5.1.2 Bog Woodland (WN7)

Large patches of bog woodland occur throughout the proposed development site, particularly along the perimeter of the site. The habitat was dominated with downy birch and willow (*Salix* spp.) with tree heights ranging between 1-15 m. Occasional Scots pine (*Pinus sylvestris*) was also recorded within the woodland. Dead wood from fallen trees was present within the woodland, along an understory dominated with ling, bracken and bramble with occasional soft rush, sweet vernal grass, dog violet, wild strawberry, heath milkwort and common nettle (*Urtica dioica*) also recorded.

5.1.3 Drainage Ditches (FW4)

Several, heavily modified drainage ditches occur across and along the perimeter of the proposed development site. The drainage ditches are deep, with steep banks ranging between 1-5 m in height and were approximately 3-6 m wide. The drainage ditches had either a stagnant or slow flow of water present, flowing in a south-westerly direction. The drainage ditches' substrate was dominated by fine peat sediment and the water colour was dark brown (peat stained). The drains were assessed as having no fishery value but may support aquatic macroinvertebrates and amphibians.

The majority of the drains with the proposed development site drain towards the southern boundary of the proposed development, into existing silt ponds and then into the Cushaling River. The Cushaling River name is retained for reference purposes, recognizing that it is part of the "Figile_010" river water body.

Drainage ditched located in the north-eastern boundary of the site, however, drain to the north into the Mulgeeth Stream, which ultimately flows into the Blackwater (Longwood) 010.

5.1.4 Depositing/lowland River (FW2)

The majority of the proposed development drains into the Cushaling River located at the south-western corner of the proposed development site. The proposed development is hydrologically connected to the Cushaling River via the existing drainage ditches.

A habitat assessment of the Cushaling River was undertaken within the watercourse at four locations as outlined in Table 3-1 above. The watercourse had a wetted width which ranged between 1-3.5 m with banks ranging between 0.2 m to 4 m in height. The river had a very slow velocity with an average depth which ranged between 20-40 cm. The substrate of the watercourse comprised mud and silt with some boulders (5%) and cobbles (15%) present further downstream. Very little instream vegetation was recorded within the watercourse. The characteristic of the river was channeled with evidence of historic modifications. The watercourse was assessed as having no suitable habitat to support protected aquatic species. Further details on the suitability of the watercourse to support protected aquatic species is described in Section 5.2.3.

A noted, a small section of the north-eastern boundary drains into the Blackwater (Longwood) 010, located approximately 720 m north-east of the proposed development site.

5.1.5 Other Habitats and Protected and Invasive Plant Species

Other habitat types (within smaller, non-representative, areas) recorded within the proposed development site included:

- Buildings and Artificial Surfaces (BL3)
- Dry meadows and grassy verges (GS2)
- Recolonising bare ground (ED3)
- Scrub (WS1)

All habitats were identified as being of Local Importance (Higher Value). No Annex I habitats of the EU Habitat Directive were recorded within the proposed development site. In addition, no plant species listed under the Flora Protection Order (FPO), or invasive plant species listed in Part 1 of the Third Schedule of the SI 477/2011, were recorded during the surveys.

5.2 Fauna

5.2.1 Mammals

No evidence of otter activity was recorded within the proposed development site during the surveys. The drainage ditches present within the proposed development site are modified, with sedimentation present and were assessed as having no fishery value, and likely to be unfavourable for otter. An otter survey was also undertaken along the section of the Cushaling River located within 150 m of the proposed development site. No evidence of otter activity was recorded along the surveyed section of the watercourse, which was, similarly, heavily modified, with sedimentation present and was assessed as having no fishery value.

Otter have previously been recorded within the Cushaling River, approximately 6.5 km downstream of the proposed development site[11]. There is potential that otter may forage and

[11] Accessed [October 2022] via: National Biodiversity Data Centre - National Biodiversity Data Centre (biodiversityireland.ie)

commute along the Cushaling River on occasion, or further downstream within the Figile River and River Barrow which is hydrologically connected to the proposed development site.

No evidence of any other Annex II mammal species listed on the EU Habitats Directive (92/43/EEC) was recorded during the surveys.

5.2.2 Marsh Fritillary

The marsh fritillary butterfly is the only Irish insect listed on Annex II of the EU Habitat Directive. The protected butterfly occurs in colonies in different habitats, including sand dunes, calcareous grassland, heath and bog habitat, and will generally lay eggs within and feed on the native plant species devil's bit scabious (*Succisa pratensis* - Phelan et al., 2021). Although survey efforts focused on the identification of suitable habitat to support the protected species, no devils bit scabious was recorded within the site. In addition, no marsh fritillary in any form of its life cycle (i.e. egg; larva/caterpillar; pupa/ chrysalis; and butterfly) was recorded. The disturbed nature of the proposed development site and lack of devil's bit scabious reflects the site unsuitability to support marsh fritillary.

5.2.3 Aquatic Species

The results of the aquatic surveys undertaken at the four sites along the Cushaling River are outlined hereunder.

5.2.3.1 Site 1

There was no visual evidence of any fish species present within the watercourse at Site 1. Two scoop tests were undertaken and were negative for the presence of lamprey. This sample site was regarded as having no suitable spawning or nursery habitat for salmonids, lamprey species or white clawed crayfish.

Kick sampling results concluded that the site has a very poor diversity of macroinvertebrate present, with only four families recorded. Macroinvertebrate recorded included a large dominance of freshwater shrimp (*Gammarus pulex*) and freshwater hog louse (*Asellus aquaticus*), with scarce occurrence of cased caddisfly (*Trichoptera spp.*) and great diving beetle larvae (*Dytiscus marginalis*). Considering the macroinvertebrate assemblage at this site and using the EPA Freshwater Biology criteria from Toner et al. (2005), this sampling site is deemed to be Class C, Moderately polluted (Q3). This score was based on the lack of diversity of organisms recorded at the site - over 50% of the sample contained *Asellus* and over 30% containing *Gammarus*. Based on the diversity and abundance, the SSRS score for this sampling site is 0.8, putting it in the SSRS category of "At Risk".

5.2.3.2 Site 2

There was no visual evidence of any fish species present within the watercourse at Site 2. Two scoop tests were negative for the presence of lamprey. Despite the presence of some gravel and instream vegetation, the watercourse at this location is heavily highly modified with no suitable habitat present to support protected aquatic species such as lamprey, Atlantic salmon or white clawed crayfish.

Site 2 is the same sampling site used by EPA which was recently received a Q2-3 status of poor and at risk in 2019[12]. Macroinvertebrate species recorded during the kick sampling included four species, freshwater shrimp, cased caddisfly larvae, freshwater hog louse and great diving beetle larvae. Considering the macroinvertebrate assemblage at this site and using EPA freshwater biological monitoring criteria from Toner et al. (2005), this stretch of river is deemed to be 'Class C, Moderately polluted (Q3)'. Over 95% of this sample consisted of *Gammarus* and *Asellus.* Based on the species present and total numbers, this section of river was given a Q3 value and an SSRS score of 0.8 putting it in the SSRS category of "At Risk".

5.2.3.3 Site 3

There was no visual evidence of any fish species present within this section of the river. Two scoop tests were negative for the presence of lamprey. The site was considered unsuitable for lamprey and salmonids due to the absence of holding pools, spawning gravels, instream vegetation, the low numbers of macroinvertebrates and the presence of heavy shading. Similarly, no suitable habitat to support white clawed crayfish was identified.

Kick sample results contained two macroinvertebrate species in low numbers (*n*=19). These species were *Gammarus* and *Asellus*. Using the EPA freshwater biological monitoring criteria from Toner et al. (2005), this stretch of river is deemed to be 'Class C, Moderately polluted (Q3)'. The SSRS score was 0 putting it in the SSRS category of "At Risk".

5.2.3.4 Site 4

There was no visual evidence of any fish species present within this section of river. A lamprey scoop test was carried out and was negative for the presence of juvenile lamprey. There is no suitable habitat to support salmonid, lamprey or white clawed crayfish within this section of the watercourse due to the absence of holding pools, spawning gravels, instream vegetation, the low numbers of macroinvertebrates and the presence of heavy shading.

Kick sample results contained five macroinvertebrate species, freshwater hog louse, great diving beetle larvae, freshwater leech (*Erpobdella testacea*), cased caddis and freshwater shrimp. Considering the macroinvertebrate assemblage at this site and using EPA freshwater biological monitoring criteria from Toner et al. (2005), this stretch of river is deemed to be 'Class C, Moderately polluted (Q3)'. Over 95% of this sample consisted of *Gammarus* and *Asellus*. This score was brought about by the diversity of organisms recorded at this site. Based on the species present and total numbers, this section of river was given a Q3 value and an SSRS score of 0 putting it in the SSRS category of "At Risk".

5.2.4 Birds

No Annex I bird species listed on the EU Birds Directive (2009/147/EC) were recorded during the bird surveys. Bird species recorded included common bird species typically found within the Irish countryside and within bog habitat.

5.3 Hydrology – Surface Water

The existing drainage network across the proposed development is illustrated on Figure 5-1.

[12] Accessed [May 2022] via https://www.catchments.ie/data/#/waterbody/IE_SE_14F010061?_k=w7w8nk

As noted, a large majority of the proposed development site occurs within the Barrow WFD Catchment (catchment ID: 14) (refer to

Figure 5-2). The proposed development drains into the Cushaling River located at the south-western corner of the proposed development site. The sub catchment (578.68 ha) which drains to the Cushaling River encompasses the whole of the existing WMF and planned landfill expansion (proposed development).

The proposed development is hydrologically connected to the Cushaling River via the existing drainage ditches. The Cushaling River flows in a south-westerly direction before it merges with the Abbeylough River to the southwest of Ticknevin, becoming the "Figile_020" water body. The Figile River ultimately drains to the River Barrow (Barrow_090) at a confluence located in proximity to Monasterevin approximately 40 km downstream of proposed development.

Table 5-1 listed the WFD water bodies within the hydrological pathway from the proposed development site to the River Barrow and River Nore SAC and their corresponding water quality. According to EPA's latest WFD status classification for the period 2016-2021, the headwater section of the Cushaling River (the Figile_010 water body) which extends into the proposed development site is at "Poor ecological status", thereby failing to meet the WFD default "Good status" objective. The "Poor" status classification is the same as the previous WFD status reporting period 2013-2018. For that period, the main cause of the "Poor ecological status" classification was "Poor invertebrate status".

Table 5-1 Barrow WFD Catchment - WFD River Water Bodies and their Corresponding Water Quality Status

WFD Name	EU Code	WFD Water Quality Status 2013-2018
Figile_010	IE_SE_14F010061	Poor
Figile_020	IE_SE_14F010100	Moderate
Figile_030	IE_SE_14F010200	Moderate
Figile_040	IE_SE_14F010300	Moderate
Figile_050	IE_SE_14F010400	Good
Figile_060	IE_SE_14F010500	Good
Figile_080	IE_SE_14F01600	Moderate
Barrow_090	IE_SE_14B011000	Poor

In addition, a small area of the proposed development site, to the far north-eastern boundary, occurs within the Boyne WFD Catchment (catchment ID: 07) (refer to

Figure 5-2).

The existing drainage network in Timahoe South Bog will be modified to accommodate the proposed development. During these works, existing drain segments will be blocked to prevent

water draining into active works areas and to divert surface water in the construction footprint away and towards new bog drains that will be established as part of the Timahoe South Bog Decommissioning Rehabilitation Plan13. With these new drains being established, a larger sub catchment area (20.78 ha) of Timahoe South Bog will drain towards the Mulgeeth Stream. By re-directing a proportion of Timahoe South Bog drainage to Mulgeeth Stream, and because the re-direction occurs to accommodate the proposed development, the proposed development becomes indirectly connected with the Blackwater River (Longwood_010) and the Boyne River catchment to the north of Timahoe Bog.

The proposed construction works area does not occur within this sub catchment, only the proposed peat emplacement berm along the eastern boundary of the proposed development and the newly blocked and re-directed drains occur within the sub catchment.

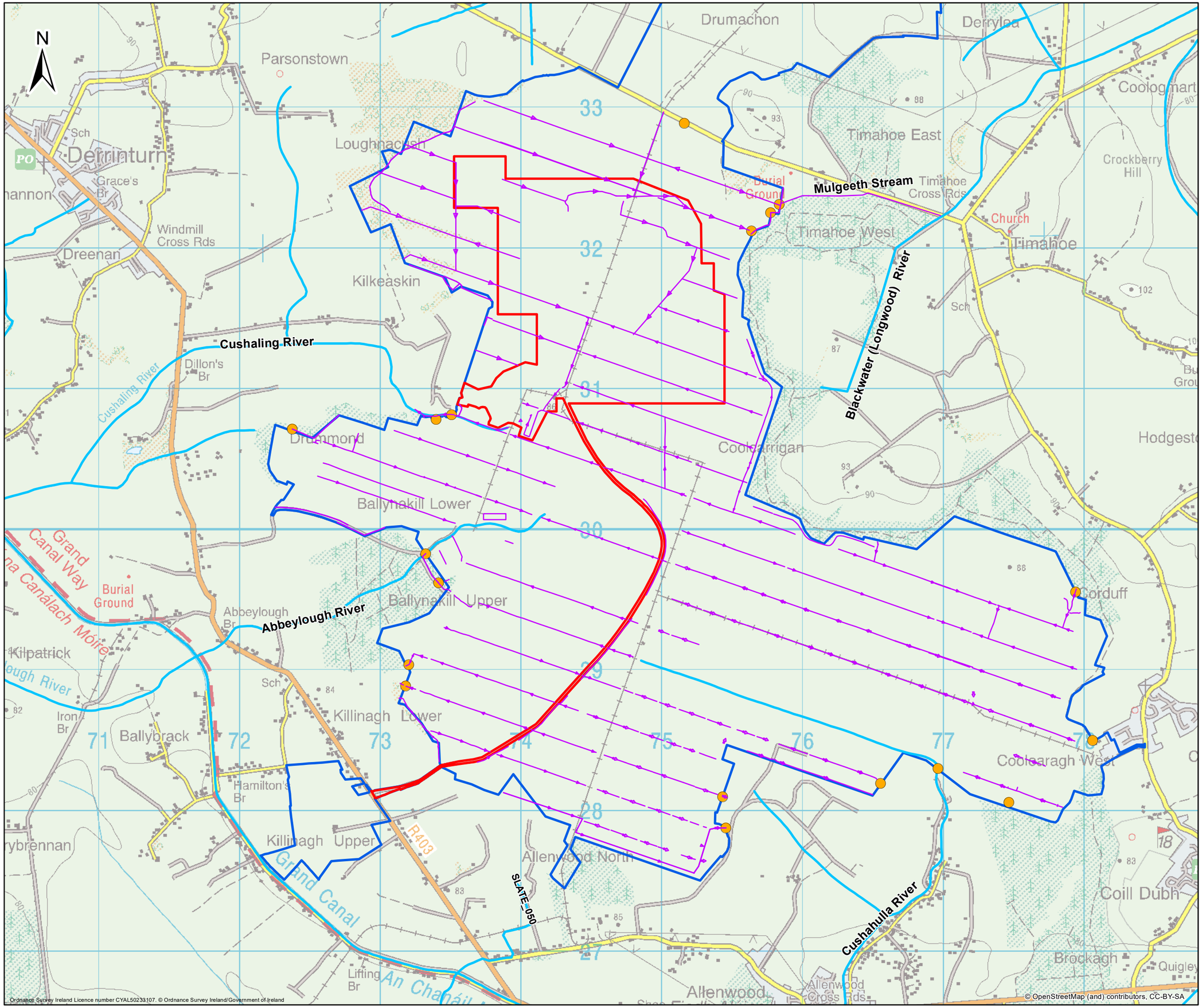
Mulgeeth Stream is part of the Blackwater (Longwood) River water body, which is also at 'Poor ecological status' (2016-2021) and also driven by "*Poor invertebrate status*", with significant environmental pressures in the sub catchment of the water body only identified as "*anthropogenic*" (EPA, 2018). It is noted that EPA's published catchment assessment reporting for the Blackwater (Longwood) River water body (EPA, 2018) refers to the 2nd cycle of WFD implementation (i.e., 2015-2021).

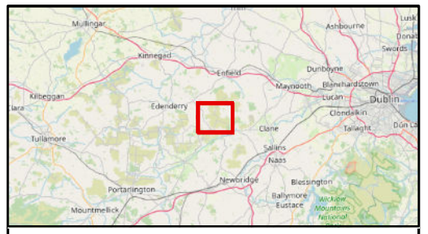
Table 5-2 lists the WFD water bodies with a hydrological pathway from the proposed development site to the River Boyne and River Blackwater SAC and their corresponding water quality status.

Table 5-2: Boyne WFD Catchment - River Water Bodies and their Corresponding Water Quality Status

WFD Name	EU Code	WFD Water Quality Status 2013-2018
Blackwater (Longwood)_010	IE_EA_07B020060	Poor
Blackwater (Longwood)_020	IE_EA_07B020100	Moderate
Blackwater (Longwood)_030	IE_EA_07B020200	Moderate
Blackwater (Longwood)_040	IE_EA_07B020300	Moderate
Blackwater (Longwood)_050	IE_EA_07B020600	Moderate
Boyne_060	IE_EA_07B040900	Good

[13] BnM Timahoe South Bog. Cutaway Bog Decommissioning and Rehabilitation Plan. Access [April 2023] via: https://www.bnmpcas.ie/wp-content/uploads/sites/18/2022/10/Timahoe-South-Rehab-Plan-_Final-v5.pdf





Legend

- Planning Application Boundary
- Bord na Móna Ownership Boundary
- Bog Outflow Points
- Existing Drainage Network

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.
D01	16/05/2023	Draft issue	S.P	J.S

Client: Bord na Móna

Project: Drehid Landfill Planning Application

Title: Èxisting Drainage

Scale @ A3: 1:25,000

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

Project Director: D.Grehan

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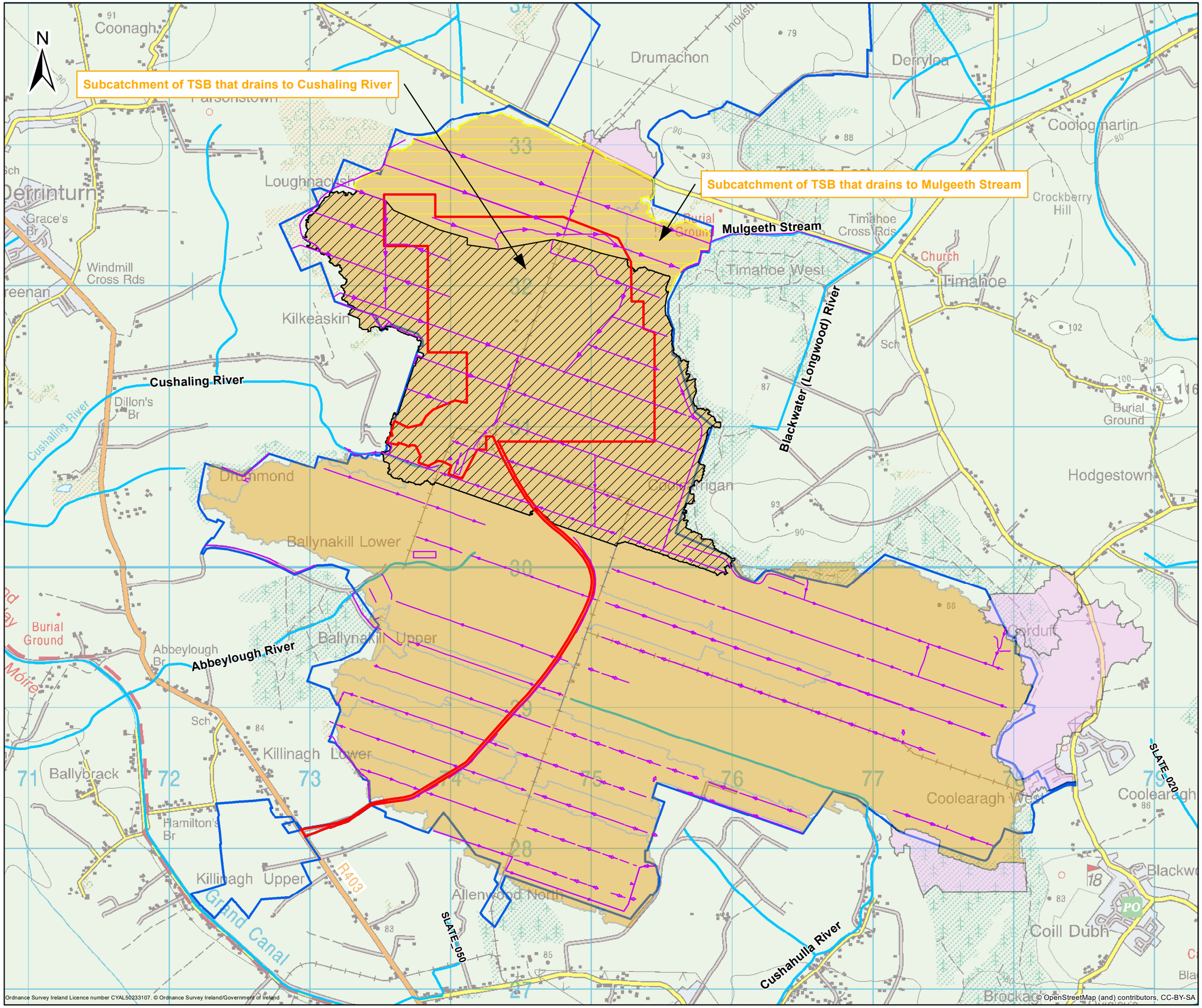
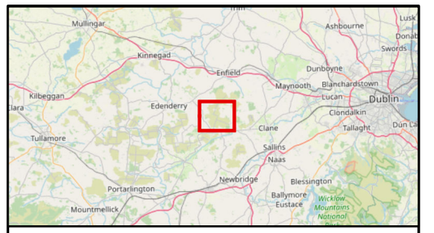
Draft: D01

Figure 5-1





Legend

- Planning Application Boundary
- Bord na Móna Ownership Boundary
- Existing Drainage Network

Catchments

- Inflow Sub-Catchment
- Outflow Catchment
- Subcatchment of TSB that drains to Mulgeeth Stream **(153.89ha)**
- Subcatchment of TSB that drains to Cushaling River **(445.44ha)**

0 250 500 750 1,000
Metres

NOTES

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4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
D01	18/05/2023	Draft issue	S.P	J.S

Client: Bord na Móna

Project: Drehid Landfill Planning Application

Title: Relevant Subcatchment Areas in TSB

Scale @ A3: 1:25,000

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

Project Director: D.Grehan

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Draft: D01

Figure 5-2

5.4 Hydrogeology – Ground Water

The proposed development site is located within the Kildare groundwater body (WFD reporting code IE_SE_G_077), with a small section of the north-eastern boundary occurring within the Trim groundwater body (IE_EA_G_002). EPA's published and latest available WFD status classification for the period 2016-2021[14] indicates that both the Kildare and Trim groundwater bodies are at "Good" qualitative (chemical) status and "Good" quantitative status (i.e., not overexploited), thus at "Good" status overall and meeting WFD "Good status" objectives.

According to the 3rd cycle river basin management plan (RBMP) for Ireland, covering the period 2022-2027 (EPA, 2021), the Kildare groundwater body is "Not At Risk" of failing to achieve WFD "Good" status objectives in 2027. However, the Trim groundwater body to the north and west of TSB is considered "At Risk", with domestic wastewater identified as the significant pressure for the groundwater body (EPA, 2021). The Trim groundwater body and its associated pressures are not relevant to groundwater conditions within TSB. Domestic wastewater is not being discharged within the bog and is not planned as part of the proposed development.

The groundwater flow system immediately beneath the landfill expansion area is defined by Quaternary sediments. This is primarily a low-permeability environment, but higher permeability lenses and likely sand/gravel channels are also present. These will serve to transmit groundwater preferentially towards the main channel and Cushaling River.

Bord na Móna undertake regular annual environmental monitoring (Marron, 2023) and have determined that groundwater flow across the WMF and landfill expansion area in both the Quaternary unit and underlying bedrock is in a south-westerly direction, towards the main channel and Cushaling River, with lateral flow gradients ranging from 0.001 to 0.005. Groundwater flow directions in the northern part of the landfill expansion area are presently influenced by the under-cell drainage system beneath the WMF. Shallow groundwater flow is also influenced locally by the drainage network in the bog, which is conceptually well understood, whereby relative water levels in groundwater and the drains interact hydraulically at a local level.

5.5 European Sites

There are no European sites located within or adjacent to the proposed development site. The closest European site is Ballynafagh Lake SAC (001387, which is located approximately 5.3 km south-east of the proposed development. The proposed development site is also hydrologically connected to three European sites; the River Barrow and River Nore SAC (002162), via the Cushaling River, and is located approximately 40 km downstream and is also hydrologically connected to the River Boyne and River Blackwater SAC (002299) and the River Boyne and River Blackwater SPA (004232). Further information on European sites within the Zone of Influence (ZoI) of the proposed development is outlined in 6.5 of this report.

6.0 OVERVIEW OF POTENTIAL IMPACTS

An overview of potential impacts from the construction, operational and decommissioning phases of the proposed development, on the receiving environment is discussed hereunder. There are several elements associated with the proposed development that may give rise to

[14] Accessed [March 2023] via: EPA Maps

direct and indirect impacts on the receiving environment that have the potential to result in likely significant effects on European sites within the ZoI of the proposed development.

6.1 Construction Phase

Potential construction phase impacts associated with the proposed development are discussed hereunder.

6.1.1 Loss of Habitat

The proposed development infrastructure occupies an approximate area of 63.4 ha, and will result in the permanent loss of habitat of a similar magnitude. Habitats within the footprint of the proposed development, which will be removed to facilitate the proposed works, include approximately 33.22 ha of cutover bog, approximately 25.32 ha of bog woodland, 2.09 ha of dry meadows and grassy verges and approximately 1.96 ha of scrub habitat. In addition, approximately 3.5 km of the existing drainage ditches will be blocked and redirected around the eastern and southern boundary of the proposed development site, resulting in a temporary loss of the habitat.

All habitats were identified as being of Local Importance (Higher Value). No Annex I habitats or rare or protected flora were identified within the proposed development site. No construction works will occur outside the proposed development site.

6.1.2 Habitat Degradation

6.1.2.1 Habitat Degradation due Water Quality Impacts

Earthworks and Sediment and Ammonia Runoff

It will be necessary to progressively clear the peat material from the proposed development site to facilitate the construction activities. Large volumes of peat and subsoil will be removed to allow construction of the proposed development, including the hardstand areas, the landfill footprints the attenuation lagoons and access roads. The excavated peat will be utilised on site and used to screen the proposed facility, in the form of an earth berm. Site clearance, excavation activities and the stockpiling of material have the potential to result in the runoff of sediment, organic matter and ammonia, if not appropriately managed, which could result in an increase of suspended solids and nutrients depositing within nearby watercourses. There are several large drainage ditches occurring throughout the proposed development site, which are all hydrologically connected to the Cushaling River and Mulgeeth Stream. Increased silt loading in watercourses can stunt aquatic plant growth, limit dissolved oxygen capacity and reduce the overall ecological quality of watercourses.

Accidental Spills and Leak of Chemical, Hydrocarbons and Concrete

There is also the potential for spills and leaks of oils, fuels and chemicals from storage areas or plant and equipment to impact on aquatic habitats. Entry of cement-based products to drains or other surface water features within the proposed development represents a risk to the aquatic environment at and downstream of the release.

Concrete and other cement-based products are alkaline and can be corrosive. They generate fine, highly alkaline silt (pH 11.5) that can physically damage fish. A pH range of ≥ 6 ≤ 9 is set in S.I. No. 293 of 1988 Quality of Salmonid Water Regulations, with artificial variations not in excess of ± 0.5 of a pH unit.

There is only a risk of chemical, hydrocarbons and concrete, in the absence of mitigation, to discharge to the Cushaling River. There is no hydrological connectivity to the construction works area and the drains which flow into the Mulgeeth.

6.1.2.2 Habitat Degradation due to Modification to the Existing Drainage Network

As discussed in Section 4.3.14.2, a new south-to-north oriented main drain will be constructed to the east of the landfill expansion footprint, as part of the TSB Decommissioning and Rehabilitation Plan. This new drain will serve bog rehabilitation purposes, and will also:

- Receive runoff from the peat berm that is being constructed along the eastern margin of the proposed landfill expansion.
- Receive overflows from drains that presently run through the landfill expansion footprint and that will be blocked off to prevent flow into the landfill excavations.

The layout of the modified drainage network is illustrated in Figure 6-1. The existing drains that presently run through the landfill expansion footprint will be blocked off sequentially in line with the sequencing of construction of landfill phases. The blocking will cause water levels in the affected drains to rise. Overflow pipes will be installed to direct the water into actively flowing drains, whereby:

- Overflows and runoff east of the landfill expansion will be directed north to the Mulgeeth Stream via the new south-to-north oriented drain.
- Overflows and runoff to the south of the landfill expansion will be directed to Cushaling River via existing, active drains.

The partial re-direction of drainage to the north is necessary and constrained by the bog's topography to the east of the landfill expansion footprint. By re-directing a proportion of drainage to Mulgeeth Stream, the Proposed Development becomes indirectly connected to the Boyne River catchment.

Specifically, the modified drainage that results from the TSB Decommissioning and Rehabilitation Plan will:

- Reduce the sub catchment area within TSB that drains to Cushaling River from approximately 445 to 413 hectares (i.e., a 7% decrease of the original sub catchment area).
- Increase the sub catchment area within TSB that drains to Mulgeeth Stream from approximately 154 to 186 hectares.

The resulting, modified sub catchment areas of the Cushaling River and Mulgeeth Stream are depicted in Figure 6-1 below. The changes mean that less of the bogs' drainage will flow to the Cushaling River and fractionally more will instead flow to the Mulgeeth Stream. Pro-rated to the new sub catchment areas, the mean flow to the Cushaling River will be reduced by 0.0021 m^3/s, or 2.1 l/s (i.e., 7% of the estimated mean flow of 0.03 m^3/s.

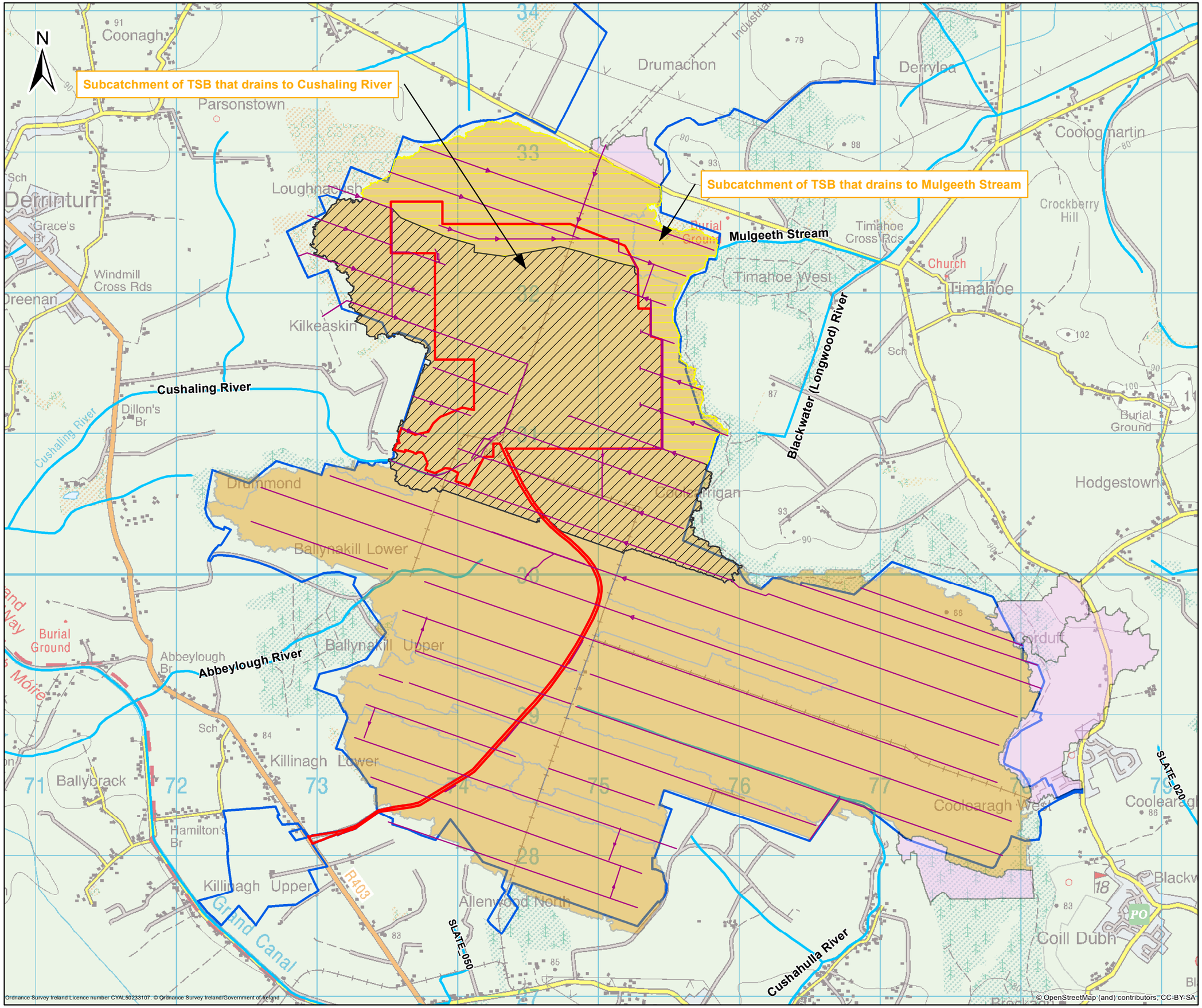
This is an imperceptible change and within the margin of error of flow estimates. Moreover, the reduced flow to Cushaling River will be partially compensated by a) the stormwater runoff from the expanded landfill which is captured by the perimeter swale and directed to Cushaling River, and b) the discharge from the new ICW which includes shallow groundwater captured by the under-cell drainage system.

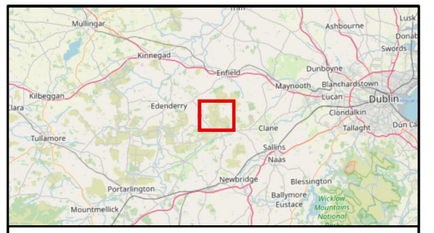
The under-cell drainage is an operational matter but will occur in parallel with sequential construction phases. Both stormwater and shallow groundwater will be actively captured and discharged (under license) during the 24-year construction phase. The indicated potential flow

reduction of the Cushaling is considered imperceptible, and will not impact or change the hydrological regime of the River Barrow.

The corresponding increase in mean flow of Mulgeeth Stream is similarly minor. Based on EPA's Qube model, the modelled mean flow of the Blackwater (Longwood) River at a location approximately 2.5 km east (and downstream) of the exit point of Mulgeeth Stream from TSB is 0.28 m^3/s[15]. This includes the drainage contribution from TNB. The additional mean flow contribution of Mulgeeth Stream represents <1% of the Qube modelled flow of the Blackwater (Longwood) River at this location. The indicated potential flow increase to the Mulgeeth Stream is considered imperceptible, and will not impact or change the hydrological regime of the River Blackwater and River Boyne downstream.

[15] $NATQ_{30}$ flow at Qube model node RW_SEG CD 07_1636, accessible from https://gis-stg.epa.ie/EPAMaps/Water





Legend

- Planning Application Boundary
- Bord na Móna Ownership Boundary
- Proposed Drainage Network

Catchments

- Inflow Sub-Catchment
- Outflow Catchment
- Subcatchment of TSB that drains to Mulgeeth Stream **(185.90ha)**
- Subcatchment of TSB that drains to Cushaling River **(413.42ha)**

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.
D01	18/05/2023	Draft issue	S.P	J.S

Client: Bord na Móna

Project: Drehid Landfill Planning Application

Title: Modified Subcatchment Areas of TSB

Scale @ A3: 1:25,000

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

Project Director: D.Grehan

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Draft: D01

Figure 6-1

6.1.2.3 Habitat Degradation due to Air Quality Impacts

Excavation activities, particularly within bare peat, can result in the temporary generation of dust in the locality of the works area. The Institute of Air Quality Management provide guidelines; 'Guidance on the Assessment of Dust from Demolition and Construction' (Holman et al., 2014), which prescribes potential dust emission risk classes to ecological receptors. Following the guidelines and considering the size of the proposed development, the scale of the earthworks were considered 'Large' (total site area >10,000 m^2). Dust may also be generated from trackout due to heavy duty vehicle (HDV) movements from the site entrance. It is anticipated that HDV movement will range between 25-30 outward movements a day which equates to 'Medium' trackout movement (Holman et al., 2014). The guidelines indicate that an assessment will be required where there is an ecological receptor within 50 m of the boundary of a site; or 50 m of the route(s) used by construction vehicles.

6.1.2.4 Habitat Degradation due to the Introduction of Invasive Plant Species

No invasive plant species were recorded within the proposed development site during the ecological surveys. There is potential, however, that the movement of construction vehicles and material to and from the site may result in the introduction of invasive species if not appropriately managed. The introduction of invasive plant species has the potential to negatively impact habitats by shading and competitively excluding native plant species, providing less favourable habitats for native fauna (TII, 2020).

6.1.3 Impacts to Groundwater

Depth of excavations will be to a maximum level of 78.2 mOD on top of which the engineered landfill liner will be built. The construction of the proposed development will influence existing runoff and groundwater recharge patterns across the expanded landfill footprint, including hardstanding areas.

Reduced recharge across the landfill expansion area is a likely hydrogeological effect. Recharge in a peat environment is limited, on the order of <5% of effective rainfall (Hunter Williams et al, 2013). Based on the national groundwater recharge map produced by GSI[16], the estimated annual average recharge across TSB is 16 mm/yr, or 4.3×10-5m/d, which is calculated from a recharge coefficient of 4%. The area of the landfill footprint is 593 m×583 m, or 345,719 m^2 (refer to Chapter 2). Hence the volume of recharge 'lost' across the landfill footprint is 15 m^3/d, which is negligible in the context of the scale of the groundwater body.

Conceptually, the reduced recharge across the footprint area means that groundwater levels will be lowered locally, which also means that groundwater flow patterns will be affected locally. However, any such effect will be masked and made imperceptible by the broader changes to the drainage network in TSB, as described in Section 6.1.2.2, as well as the lowering of groundwater levels that will occur as a result of the new under cell drainage system.

[16] Accessed [March 2023] via: https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228

6.1.4 Peat Slippage

Peat can be mobilized when disturbed, but given the flat topography of the proposed development site, the risk of peat slippage is considered unlikely. Landslide susceptibility within the proposed development site is mapped by GSI[17] as "Low", which considers topographic slope, soil type and concentration / dispersion of overland flow. There are no previous records of peat slides within the wider Timahoe Bog in the past.

6.1.5 Disturbance (Noise and Lighting)

The proposed construction works will result in an increase in noise levels during the construction phase, as well as an increase in personnel and traffic movement to and from the site. It should be noted that no rock breaking or blasting will be required during the construction works.

It is likely that temporary construction lighting will be required during the construction works. Fugitive lighting could deter movement of species in the area. A temporary increase in noise levels, disturbance and lighting within the proposed development site may result in disturbance to wildlife within the immediate vicinity of the site.

6.2 Operational Phase

Potential operational phase impacts associated with the proposed development are discussed hereunder.

6.2.1 Disturbance (Noise and Lighting)

During the operational phase, the proposed development will result in a slight increase in noise levels within the immediate vicinity of the proposed development. Noise levels, however, will be similar to the existing baseline levels at the existing waste facility. Mammals and bird species are likely to be acclimatised to local disturbance from the existing waste facility, located directly adjacent to the proposed development site. Noise and disturbance from the operational phase of the proposed development are not likely to result in negative effects on the local populations of mammal and bird species.

New lighting will be installed as part of the proposed development site (Section 4.3.6.13). The new lighting will result in an increase in artificial lighting within the proposed development site and immediate surrounding area, which can negatively impact nocturnal species (Rich & Longcore, 2005).

6.2.2 Habitat Degradation due to Surface Water Impacts

6.2.2.1 Stormwater Drainage

During the operational phase, all stormwater will be collected via drains and gullies, which will discharge to surface water attenuation lagoons for treatment. The overflow from these attenuation lagoons will be then diverted to the proposed ICW to provide an additional treatment, prior to discharge to a nearby bog drainage channel, which ultimately slowly drains to the Cushaling River. Both the attenuation lagoons and ICW, which form part of the proposed development (Section 4.3.6.8), will ensure all stormwater is treated prior to discharge.

[17] Accessed [October 2022] via https://dcenr.maps.arcgis.com/apps/MapSeries/

The proposed attenuation lagoons and ICWs are designed to accommodate 6-hour duration, 1 in 100 year storm events. The new attenuation lagoons and ICWs will serve to buffer sediment load during storm events and contribute to chemical load reduction to the Cushaling River. The dense vegetation in the ICW ponds will result in in a substantial volume of water being lost to the atmosphere through evapotranspiration. In addition, certain key emergent plant species used within the wetland will result in evapotranspiration of approximately 1000 mm/ha of water annually (Barco, et al., 2018).

There parameters of the projected remaining ICW effluent which will be discharged into the Cushaling are outlined in Table 4-3: above, will be within the limits of the IED license conditions. The outputs of the stormwater will also be compliant with the EC (Quality of Salmonid Waters) Regulations 1988 (refer to Table 4-3 above). Considering discharge will comply with the limits of the IED license conditions and will be compliant the Salmonid regulations there is no potential for water quality impacts or impacts to salmonids and their spawning habitats.

Both the attenuation ponds and the ICW will require maintenance and monitoring during the operational phase. In the event that regular maintenance is not carried out on the stormwater infrastructure there is potential that contaminated stormwater drainage may be discharged into the Cushaling River. The release of contaminated surface water within the watercourse can negatively impact water quality.

6.2.2.2 Leachate and Foul Water

Leachate/process wastewater will be generated in both the new landfill and within the MSW processing and composting plant. 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.

As part of the proposed development, a herringbone leachate collection system will be constructed on top of the basal liner, as described in Section 4.3.10. Collected leachate will drain to collection sumps, from where it will be pumped to raw leachate storage tanks located in the existing storage compound. The leachate will then be collected daily and removed off-site in road tankers to a waste facility or WWTP. Considering the full containment and removal of leachate, the potential for impacts to receiving water bodies (such as the nearby Cushaling River) during the operational phase is unlikely.

In the unlikely event that pollutants are identified in the discharge water pollutants will undergo attenuation in the subsurface (groundwater) environment and will be partially or wholly captured by the under-cell drainage system. As such, the under-cell drainage system acts as a second barrier.

As described in Section 4.3.6.9, all sanitary wastewater will be collected and routed to a new primary treatment tank located adjacent to the new soils processing building with the liquid effluent been 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, before being removed off-site regularly to Uisce Éireann WWTP's or other approved waste water facilities. Therefore, the potential for wastewater to result in impacts during the operational phase is improbable.

6.2.3 Habitat Degradation due to Air Quality Impacts

6.2.3.1 Air Emissions

AWN Consulting Ltd. were commissioned to carry out an air dispersion modelling study of air emissions from the existing facility and the licensed waste management activities at WMF and considered the proposed extension.

The purpose of the air dispersion modelling study was to determine whether the air and odour emissions from the facility will lead to ambient concentrations which are in compliance with the relevant ambient air quality standards and guidelines for odour, NO_2 & $PM_{10}/PM_{2.5}$. The assessment was conducted using the methodology outlined in "Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)" (EPA, 2020).

The NO_2 modelling results are detailed in Table 6-1. The results indicate that the ambient ground level concentrations at the worst-case ground level location are significantly below the relevant air quality standards for NO_2. Cumulative emissions from the gas utilisation plant and flares lead to an ambient NO_2 concentration (including background) which is 79% of the maximum ambient 1-hour limit value (measured as a 99.8th%ile) and 31% of the annual limit value at the worst-case off-site location (see Table 6-1). At the worst-case receptor this ambient NO_2 concentration (including background) which is 20% of the maximum ambient 1-hour limit value (measured as a 99.8th%ile) and 23% of the annual limit value.

With respect to Designated sites, the closest European site to the area of operation is Ballynafagh Lake SAC (001387), which is located approximately 5.3 km south-east of the proposed development site boundary. NOx concentrations due to the gas utilisation plant and flares at this European site, and all other European sites located beyond this distance, is considered negligible. Process contributions within the closest European site (Ballynafagh Lake SAC) are less than 0.1 µg/Nm^3 or 0.3% of the 30 µg/m^3 limit value for NOx with respect to the projection of sensitive habitats. There is therefore no potential for air emission from the proposed development, in combination with the existing facility to result in impacts to any European site.

Table 6-1: Dispersion Model Results– NO2

Pollutant/ Meteorological year	Background (µg/m^3)	Averaging Period	NO_2 Process Contribution (µg/m^3)	NO_2 Predicted Environmental Concentration (PEC) (µg/Nm^3)	% of Standard (µg/Nm^3)	Standard (µg/Nm^3) *Note 1*
NO_2 / 2017	16	99.8th%ile of 1-hr means	132.8	148.8	74%	200
	8	Annual Mean	4.3	12.3	31%	40
NO_2 / 2018	16	99.8th%ile of 1-hr means	142.2	158.2	79%	200
	8	Annual Mean	3.8	11.8	29%	40
NO_2 / 2019	16	99.8th%ile of 1-hr means	138.8	154.8	77%	200

Pollutant/ Meteorological year	Background (µg/m³)	Averaging Period	NO_2 Process Contribution (µg/m³)	NO_2 Predicted Environmental Concentration (PEC) (µg/Nm³)	% of Standard (µg/Nm³)	Standard (µg/Nm³) *Note 1*
	8	Annual Mean	3.9	11.9	30%	40
NO_2 / 2020	16	99.8th%ile of 1-hr means	139.9	155.9	78%	200
	8	Annual Mean	4.4	12.4	31%	40
NO_2 / 2021	16	99.8th%ile of 1-hr means	141.1	157.1	79%	200
	8	Annual Mean	3.6	11.6	29%	40

Note 1 Air Quality Standards 2011 (from EU Directive 2008/50/EC)

6.3 Decommissioning Phase

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. Decommissioning will include the dismantling of infrastructure, minor excavation activities and the removal of waste offsite. Impacts during decommissioning are expected to be of similar type and magnitude to those anticipated during the construction phase, but generally of a shorter duration.

6.4 Determining the Likely Zone of Influence

As an initial approach, all European sites within a 15 km radius were examined. Additionally, the source-pathway-receptor model (OPR, 2021) was used to identify viable pathways between the proposed development and European sites which may result in likely significant effects on their qualifying interests or special conservation interest. This conceptual model is a standard tool in environmental assessment. In order for an effect to occur, all three elements of this model must be in place. The absence or removal of one of the elements of the model means there is no likelihood for the effect to occur. In the context of the proposed development, the model comprises:

- Source(s) – potential impacts from the proposed development, e.g. loss of habitat, direct emissions (water, air, noise and light);
- Pathway(s) – hydrological, physical or ecological connectivity between the proposed development and the European site; (e.g. water bodies and proximity); and
- Receptor(s) – qualifying interests and/or special conservation interests of the European sites.

In order to inform the source-pathway-receptor model, the ZoI needs to be established. The Chartered Institute of Ecology and Environmental Management (CIEEM) defines the ZoI of a project as the area(s) over which ecological features may be affected by the biophysical changes caused by the proposed project and associated activities (CIEEM, 2018).

In order to establish the ZoI of the proposed development works, the likely key biophysical changes associated with the works were determined having regard to the project

characteristics set out in Section 4.1 of this report. The ZoI of the proposed development (in the absence of any mitigation measures) is described hereunder.

Impacts associated with the loss of habitats will be confined to within the proposed development site boundary. The ZoI for this type of effects is defined as all lands within the proposed development site boundary.

With regards potential habitat degradation effects associated with the release of sediment and other pollutants to surface water, the ZoI of the proposed development is considered to include receiving water bodies adjacent to or downstream of the proposed development site during the construction, operation and decommissioning phases. Considering significant effects associated with the water pollution, hydrological connectivity will not be considered effective past the first water body of depositional nature is reached (e.g. lake water body; transitional water body). The ZoI of water quality effects from the proposed development are outlined hereunder:

- Hydrological connectivity to the south of the proposed development site will include all the Cushaling River until the Barrow Suir Nore Estuary WFD transitional water body.
- Hydrological connectivity to the north-east of the proposed development site will include the Mulgeeth Stream until the Boyne Estuary WFD transitional water body.

Considering the significant downstream distance, the transitional nature of the waterbody coupled with the total volume of water, no water quality impacts from the proposed development are anticipated beyond these points.

As noted in Section 6.1.2.3, the spatial limit of dust impacts was established as 50 m from the site entrance. The ZoI for dust impacts was therefore established as 50 m from the proposed development site boundary.

Noise from the construction activity has the potential to cause disturbance to resting, foraging and commuting qualifying and special conservation interest species. Individual species will elicit differing behavioural responses to disturbance at different distances from the source of disturbance. Below is a summary of the documented zones of influence for varying species.

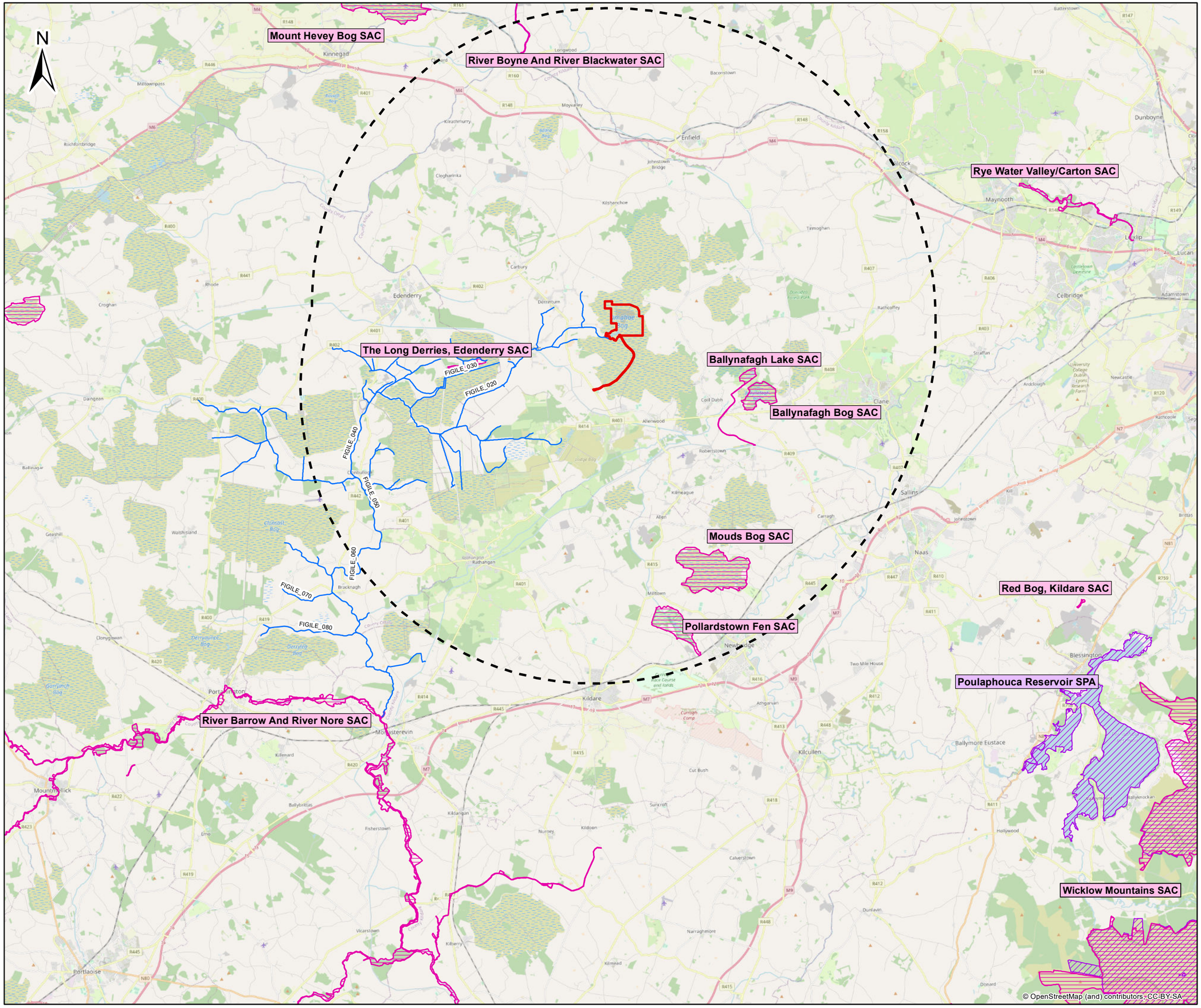
Transport Infrastructure Ireland (formally the National Roads Authority) has produced a series of best practice planning and construction guidelines (NRA, 2008) for the treatment of certain protected mammal species (e.g. otter), which indicate that disturbance to terrestrial mammals would not extend beyond 150 m.

Cutts et al. (2013) notes that different types of disturbance stimuli are characterised by different avifaunal reactions, however as a general rule of thumb, a distance of 300 m can be used to represent the maximum likely disturbance distance for waterfowl. Notwithstanding, disturbance to bird species will be considered individually where required.

The ZoI for noise/disturbance was, therefore, established as the proposed development site plus a 300 m buffer.

6.5 Identification of Relevant European Sites

As mentioned, as an initial step, all European sites within a 15 km radius or with hydrological connectivity to the proposed development, were reviewed and are illustrated in Figure 6-2 and Figure 6-3 and listed in Table 6-2 below. The source-pathway-receptor conceptual model (OPR, 2021) was then used to identify a list of 'relevant' European sites (i.e. those which could be potentially affected).



Legend

- Proposed Development
- 15km Buffer from Proposed Development Site
- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- WFD - River Water Bodies - Barrow Catchment

0 2.5 5 7.5 10
Kilometres

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.
D01	23/11/2022	Draft issue	S.P	A.S

Client: Bord na Móna

Project: Drehid Landfill Planning Application

Title: European Sites Map

Scale @ A3: 1:180,000

Prepared by: S.Pezzetta | Checked: A.Sands | Date: November 2022

Project Director: D.Grehan

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Figure 6-2

Draft: D01

River Boyne and River Blackwater SPA

River Boyne and River Blackwater SPA

Boyne Coast And Estuary SAC

Boyne Estuary SPA

River Nanny Estuary and Shore SPA

River Boyne And River Blackwater SAC

Girley (Drewstown) Bog SAC

River Boyne and River Blackwater SPA

River Boyne and River Blackwater SPA

River Boyne and River Blackwater SPA

Rye Water Valley/Carton SAC

The Long Derries, Edenderry SAC

Ballynafagh Lake SAC

Ballynafagh Bog SAC

Legend

- Application Boundary
- 15km Buffer from Proposed Development Site
- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- WFD - River Water Bodies

0 2.5 5 7.5 10

Kilometres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
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D01	19/04/2023	Draft issue	S.P	R.A
Issue	Date	Description	By	Chkd.

Client: Bord na Móna

Project: Drehid Landfill Planning Application

Title: European Sites Map

Scale @ A3: 1:250,000

Prepared by: S.Pezzetta | Checked: R,Aherne | Date: April 2023

Project Director: D.Grehan

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Draft: D01

Figure 6-3

Table 6-2: European Sites and the Assessment of Likely Significant Effects

European Site	Qualifying Interests / Special Conservation Interests	Source-Pathway-Receptor Link	Possibility of Likely Significant Effects
Ballynafagh Lake SAC (Site Code: 001387) Distance: ca. 5.3 km south-east	• Desmoulin's Whorl Snail (*Vertigo moulinsiana*) [1016] • Marsh Fritillary (*Euphydryas aurinia*) [1065] • Alkaline fens [7230]	The SAC is located approximately 5.3 km south-east of the proposed development site and thus occurs outside the ZoI for direct habitat impacts or dust effects (i.e. occurs more than 50 m from the proposed development site). In addition, no Annex I habitat of the EU Habitats Directive was identified within the proposed development site. There is no hydrological connectivity (surface water) between the proposed development site and this SAC. The SAC is designated for a groundwater dependant habitat. Both the proposed development site and the SAC are located within the same groundwater body – Kildare Groundwater Body (European Code: IE_SE_G_077). Despite occurring within the same groundwater body there is no hydrogeological connectivity as all groundwater flow is to the south-west of the proposed development (Marron, 2023) (refer to Section 5.4). No source-pathway-receptor link exists between the proposed development site and this SAC.	No potential for likely significant effects.
Ballynafagh Bog SAC (Site Code: 000391) Distance: ca. 5.9 km south-east	• Active raised bogs* [7110] • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the *Rhynchosporion* [7150]	The SAC is located approximately 5.9 km south-east of the proposed development site and thus occurs outside the ZoI for direct habitat impacts or dust effects (i.e. occurs more than 50 m from the proposed development site). In addition, no Annex I habitat of the EU Habitats Directive was identified within the proposed development site. There is no hydrological connectivity between the proposed development site and this SAC. No source-pathway-receptor link exists between the proposed development site and this SAC.	No potential for likely significant effects.

European Site	Qualifying Interests / Special Conservation Interests	Source-Pathway-Receptor Link	Possibility of Likely Significant Effects
Mouds Bog SAC (Site Code: 002331) Distance: ca. 9.3 km south-east	• Active raised bogs* [7110] • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the *Rhynchosporion* [7150]	The SAC is located approximately 3 km south-east of the proposed development site and thus occurs outside the ZoI for direct habitat impacts or dust effects (i.e. occurs more than 50 m from the proposed development site). In addition, no Annex I habitat of the EU Habitats Directive was identified within the proposed development site. There is no hydrological connectivity between the proposed development site and this SAC. No source-pathway-receptor link exists between the proposed development site and this SAC.	No potential for likely significant effects.
The Long Derries, Edenderry SAC (Site Code: 000925) Distance: ca. 5.7 km south-east	• Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]	The SAC is located approximately 5.7 km south-west of the proposed development site and thus occurs outside the ZoI for direct habitat impacts or dust effects (i.e. occurs more than 50 m from the proposed development site). In addition, no Annex I habitat of the EU Habitats Directive was identified within the proposed development site. There is no hydrological connectivity between the proposed development site and this SAC. No source-pathway-receptor link exists between the proposed development site and this SAC.	No potential for likely significant effects.
Pollardstown Fen SAC (Site Code: 000396) Distance: ca. 11.5 km south-east	• Geyer's Whorl Snail (*Vertigo geyeri*) [1013] • Narrow-mouthed Whorl Snail (*Vertigo angustior*) [1014] • Desmoulin's Whorl Snail (*Vertigo moulinsiana*) [1016] • Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae** [7210]	The SAC is located approximately 11.5 km south-east of the proposed development site and thus occurs outside the ZoI for direct habitat impacts or dust effects on habitats (i.e. occurs more than 50 m from the proposed development site). In addition, no Annex I habitat of the EU Habitats Directive was identified within the proposed development site. There is no hydrological connectivity between the proposed development site and this SAC. The SAC is designated for groundwater dependent habitats and species. The proposed development site is located within	No potential for likely significant effects.

European Site	Qualifying Interests / Special Conservation Interests	Source-Pathway-Receptor Link	Possibility of Likely Significant Effects
	• Petrifying springs with tufa formation (*Cratoneurion*)* [7220] • Alkaline fens [7230]	the Kildare Groundwater Body (European Code: IE_SE_G_077) while the SAC is located within the GWDTE-Pollardstown Fen (European code: IE_SE_G_106) and Curragh Gravels West (European Code: IE_SE_G_133). Therefore, there is no hydrogeological connectivity between the SAC and the proposed development. No source-pathway-receptor link exists between the proposed development site and this SAC.	
River Boyne and River Blackwater SAC (Site Code: 002299) <u>Distance:</u> Ca. 13.3 km north-west (straight line measurement) ca. 30 km hydrological route	• River Lamprey (*Lampetra fluviatilis*) [1099] • Salmon (*Salmo salar*) [1106] • Otter (*Lutra lutra*) [1355] • Alkaline fens [7230] • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)* [91E0]	The SAC is located approximately 13.3 km north of the proposed development site and thus occurs outside the ZoI for direct habitat impacts or dust effects (i.e. occurs more than 50 m from the proposed development site). The SAC is hydrologically connected to the proposed development via the Mulgeeth and Blackwater River (hydrological route ca. 30 km). The proposed development site has the potential to result in a degradation of water quality of these rivers during the construction, operation and decommissioning phases. The SAC is designated for aquatic habitats and species, which are sensitive to changes in water quality. A source-pathway-receptor link exists between the proposed development site and this SAC.	**Yes** - Indirect impacts via a degradation of water quality could result in likely significant effects on the qualifying interests of the SAC.

European Site	Qualifying Interests / Special Conservation Interests	Source-Pathway-Receptor Link	Possibility of Likely Significant Effects
River Boyne and River Blackwater SPA (Site Code: 004232) <u>Distance:</u> ca. 13.3 km north-west (straight line measurement) ca. 30 km hydrological route	• Kingfisher (*Alcedo atthis*) [A229]	The SPA is located approximately 14 km north of the proposed development site and thus occurs outside the ZoI for direct habitat impacts or dust effects (i.e. occurs more than 50 m from the proposed development site). The SPA is hydrological connected to the proposed development via the Mulgeeth and Blackwater River (hydrological route ca. 30 km). The proposed development site has the potential to result in a degradation of water quality of these rivers during the construction, operation and decommissioning phases. The SPA is designated for kingfisher. A survey undertaken in 2010 recorded 19 pairs of kingfisher (based on 15 probable 4 possible territories) in the River Boyne and River Blackwater SPA (NPWS, 2010). A degradation of water quality impacts could negatively impact the resident kingfisher due to a decrease in their feeding resources. A source-pathway-receptor link exists between the proposed development site and this SAC.	**Yes** - Indirect impacts via a degradation of water quality could result in likely significant effects on the qualifying interests of the SPA.
River Barrow and River Nore SAC (Site Code: 002162) <u>Distance:</u> ca. 19.7 km (straight line measurement) ca. 40 km hydrological route	• Desmoulin's whorl snail (*Vertigo moulinsiana*) [1016] • Freshwater pearl mussel (*Margaritifera margaritifera*) [1029] • White-clawed crayfish (*Austropotamobius pallipes*) [1092] • Sea lamprey (*Petromyzon marinus*) [1095] • Brook lamprey (*Lampetra planeri*) [1096]	The SAC is located approximately 19.7 km south of the proposed development site and thus occurs outside the ZoI for direct habitat impacts or dust effects (i.e. occurs more than 50 m from the proposed development site). In addition, no Annex I habitats of the EU Habitats Directive were identified within the proposed development site. There is no potential for impacts to the terrestrial habitats designated within the SAC. The SAC is hydrological connected to the proposed development via the Figile and River Barrow. The proposed development site has the potential to result in a degradation of water quality of these rivers during the construction, operation and decommissioning phases. The	**Yes** - Indirect impacts via a degradation of water quality could result in likely significant effects on the aquatic freshwater qualifying interests of the SAC.

European Site	Qualifying Interests / Special Conservation Interests	Source-Pathway-Receptor Link	Possibility of Likely Significant Effects
	• River lamprey (*Lampetra fluviatilis*) [1099] • Twaite shad (*Alosa fallax*) [1103] • Atlantic salmon (*Salmo salar*) (only in fresh water) [1106] • Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • *Salicornia* and other annuals colonizing mud and sand [1310] • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] • Otter (*Lutra lutra*) [1355] • Mediterranean salt meadows (*Juncetalia maritimi*) [1410] • Killarney fern (*Trichomanes speciosum*) [1421] • Nore freshwater pearl mussel [1990] (*Margaritifera durrovensis*) • Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] • European dry heaths [4030] • Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]	SAC is designated for aquatic habitats and species (i.e. white clawed crayfish, brook lamprey, river lamprey, sea lamprey, Atlantic salmon, otter, alluvial forests, watercourses of plain to montane levels the *Ranuncullion fluitantis* and *Callitricho-Batrachion* vegetation) and Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels) which are sensitive to changes in water quality. The designated estuarine and marine habitats of the SAC (estuaries, tidal mudflats and sandflats, reefs, Salicornia mud, Atlantic salt meadows and Mediterranean salt meadows occur a minimum of approximately 180 km downstream of the proposed development site within the Barrow Suir Nore Estuary (NPWS, 2011). There is no potential for water quality impacts on these habitats from the proposed development (during the construction, operational and decommissioning phases) due to the significant downstream distance (ca. 180 km) and the depositional nature of the transitional waterbody which the habitats occur within. A source-pathway-receptor link exists between the proposed development site and the SAC.	

European Site	Qualifying Interests / Special Conservation Interests	Source-Pathway-Receptor Link	Possibility of Likely Significant Effects
	• Petrifying springs with tufa formation (*Cratoneurion*)* [7220] • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] • Alluvial forests with *Alnus glutinosa* and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*)* [91E0]		

7.0 IDENTIFICATION OF LIKELY SIGNIFICANT EFFECTS

7.1 Potential for Likely Significant Effects

As noted in Table 6-2, a viable source-pathway-receptor link was identified between the proposed development site and the River Barrow and River Nore SAC (002162).

The SAC is hydrological connected to the proposed development via the Cushaling/Figile and River Barrow through a ca. 40 km hydrological pathway. The proposed development site has the potential to result in the degradation of water quality during the construction, operation and decommissioning phases. The SAC is designated for aquatic habitats and species which are sensitive to changes in water quality. A degradation of water quality would result in likely significant effects on the qualifying interests in view of their conservation objectives.

7.2 Potential for In-Combination Effects

Article 6(3) of the Habitats Directive requires that:

> *"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives."*

It is therefore required that the potential impacts of the proposed development are considered in-combination with any other relevant plans or projects. Projects which have been completed, approved or which are proposed, as well as proposals within county development plans, located within the ZoI of the proposed development, have been considered in the in-combination assessment, and are discussed hereunder.

7.2.1 Projects

A review of the EIA portal[18] and Kildare Planning Portal[19] identified projects in the surrounding area to the proposed development. A summary of the projects is provided hereunder.

<u>Timahoe North Project (Planning Ref.: 18303249)</u>

Bord na Móna Powergen Ltd & ESB are proposing to develop a solar farm and a 110kV substation and grid connection in Timahoe North Bog, located approximately 560 m north of the proposed development site. The proposed solar farm and substation was subject to Appropriate Assessment - Natura Impacts Statement (NIS) (McCarthy Keville O'Sullivan, 2018). The NIS included a conclusion of the Appropriate Assessment (AA) Screening Report which states that the there is *'potential for the Proposed Project to affect the River Boyne and River Blackwater SAC (002299) and River Boyne and River Blackwater SPA (004232), as a result of deterioration in surface water quality during the construction, operation and decommissioning phases of the proposal'.* The NIS assessed the potential for adverse affect of the Proposed Project on the two European sites and concluded that following the implementation of the prescribed mitigation measures there is no potential for adverse effects on the integrity of the two European sites. Considering there is no potential for adverse effects and there is no connectivity between the proposed development (under appraisal in this report) and the River

[18] Accessed [May 2022] via https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?
[19] Accessed [May 2022] via http://webgeo.kildarecoco.ie/planningenquiry

Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA, there is no potential for any in-combination effects.

Coolcarrigan Solar Array (Planning Ref.: 151172)

Wilson Wright is proposing the development of a solar farm comprising 40,007 individual solar panels and associated infrastructure at a site located immediately east of the proposed development site. The proposed solar farm was subject to the test of Appropriate Assessment – an AA Screening report was prepared (McCarthy Keville O'Sullivan, 2015). The AA screening report identified eight European sites within 15 km of the proposed development site. However, no viable source-pathway-receptor link was identified between the proposed development and the eight European sites. The screening report concluded that *'in view of best scientific knowledge and on the basis of objective information, the proposed works, individually or in combination with other plans and projects, will not have a significant effect on the European sites'.* There is, therefore, no potential for an in-combination of effects with the proposed development under appraisal in this report.

North Kildare Wind Farm (Planning Ref.: 181534)

North Kildare Wind Farm Limited are proposing the development of wind farm with 12 no. wind turbines and associated infrastructure in County Kildare at a site located approximately 1 km north of the proposed development. A Screening for AA and NIS report of the proposed windfarm was prepared (Fehily Timoney, 2018). The NIS identified the potential for adverse effects (indirect effects) to the River Boyne and River Blackwater SAC (002299) and River Boyne and River Blackwater SPA (004232) due to a degradation of water quality and introduction of invasive species. The NIS goes on to prescribe stringent mitigation measures which will be employed during the construction phase of the development and concluded that following *'the implementation of the detailed mitigation measures identified in this NIS, the integrity of the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA will not be adversely affected'*. Considering proposed wind farm will not result in adverse effects adverse effects on any European sites and occurs within a separate water catchment, there is no potential for in-combination effects with the proposed development under appraisal in this report.

Water Supply Project (Application in Process)

Uisce Éireann is in the process of preparing a planning application for submission to An Bord Pleanála for the Water Supply Project – Eastern and Midlands Region (WSP). The WSP comprises the abstraction of water from the lower River Shannon at Parteen Basin in County Tipperary, with water treatment nearby at Birdhill. Treated water will then be piped 170 km to a termination point reservoir at Peamount in south County Dublin, connecting into the Greater Dublin network.

It should be noted that the final route of the WSP and its environmental impacts will only be known when the planning application is submitted to An Bord Pleanála. However, a review of the Final Options Appraisal / EIS Scoping Report (Uisce Éireann, 2018) indicates that the proposed pipeline will run to the west and north of the proposed development (located ca. 380 m at the closest point from the proposed development) and will cross the Figile River, at a number of locations, downstream of the proposed development. The WSP could result in the uncontrolled release of sediment laden water and hydrocarbons into the Figile River and the within the River Barrow and River Nore SAC, if not appropriately managed. Without the implementation of mitigation measures there is potential for the WSP project to result in in-combination effects with the proposed development under appraisal in this report.

Existing Drehid Waste Facility

The existing Drehid WMF and other consented and proposed activities (as set out in Section 4.2) is located directly adjacent to and will share much of the same infrastructure as the proposed development. The existing Drehid WMF is regulated by the EPA in accordance with IE Licence Reg. No. W0201-03. In addition, settlement lagoons are currently located at the existing WMF to deal with all of the requirements for preliminary surface water treatment. There is no potential for an in combination of impacts within the proposed development under appraisal.

Other Smaller Developments:

There have been a number of projects and applications in the area surrounding the Drehid bog that involve the construction or extension of small residential properties. Due to the small nature of these developments and lack of connectivity, there will be no significant impacts on any designated sites and therefore there is no potential for in combination effects with the proposed development.

7.2.2 Plans

Timahoe South Rehabilitation Plan

A rehabilitation and decommissioning plan is currently ongoing at Timahoe South Bog. The Plan consists of the rehabilitation of part of the Timahoe South Bog as part of BnM's Peatlands Climate Action Scheme (PCAS), by raising water levels to the surface through internal drain blocking, and other techniques. A NIS of the Plan was prepared by INIS (INIS, 2022). The screening process concluded that potentially adverse effects on the qualifying interests and special conservation interests of the River Boyne and River Blackwater SAC [002299], the River Boyne and River Blackwater SPA [004232] and the River Barrow and River Nore SAC [002162] could not be excluded, due to the potential for effects via surface water contamination and the spread of invasive alien species. The NIS prescribes mitigation measures that will be implemented during the duration of the rehabilitation plan and concludes that the proposed Plan will thus not give rise to adverse effects on the integrity of a Natura 2000 site or sites evaluated herein. There is therefore no potential for an in-combination of effects with the proposed development under appraisal in this report.

Kildare Count Development Plan

The proposed development site is located in Kildare County administrative area. The Kildare County Development Plan 2023-2029[20] includes objectives and policies which are associated with the protection of European sites (Relevant Policies and Objectives include: BI P2, BI O8, BI O9, BI 10 and BI O11). All new plans and projects proposed within the county must adhere to the above-mentioned policies and objectives, which ensures that all plans and projects proposed will not result in significant effects on biodiversity and European sites, and includes the requirement that any future proposed plans or projects to be subject to Appropriate Assessment to examine and assess their effects on European sites, alone and in-combination with other plans and projects.

[20] Accessed [October 2022] via: https://draftkildarecdp2023-2029.ie/

8.0 SCREENING ASSESSMENT CONCLUSION

Following an examination, analysis and evaluation of the relevant information, including in particular, the nature of the proposed development and its potential relationship with European sites, as well as applying the precautionary principle, it is the professional opinion of the authors of this report that it is not possible to rule out the possibility of significant effects on the River Barrow and River Nore SAC (000216), the River Boyne and River Blackwater SAC (002299) and the River Boyne and River Blackwater SPA (004232), for the reasons outlined in Table 6-2.

This judgement has been reached on the basis of the potential impact sources and pathways associated with the proposed development (as outlined in Section 4.0) which may put qualifying interest species or habitats/special conservation interest species at risk.

For these reasons, it is the professional opinion of the authors of this report that the application for consent for the proposed development requires an Appropriate Assessment to be undertaken, for which a Natura Impact Statement (NIS) will be required to assess whether the proposed development would adversely affect the integrity of any European sites.

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Appendix 1 – Design Drawing

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