SCOTT
CAWLEY

# Biodiversity Management Plan For Knockharley Landfill, Co. Meath.

prepared for AWN Consulting Ltd

on behalf of Beauparc Utilities Limited

Scott Cawley, College House, 71 – 73 Rock Road, Blackrock, Co. Dublin, A94 F9X9, Ireland

Tel+353(1)676-9815 Fax +353(1) 676-9816

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# 1 Introduction

1 This Biodiversity Management Plan (hereafter referred to as “BMP”) describes specific biodiversity enhancement and management measures for the Proposed Development and is prepared by Scott Cawley Ltd., on behalf of AWN Consulting Ltd. This includes the establishment of enhancement measures, maintenance and monitoring of these measures to create a net gain in biodiversity over the proposed 20-year lifespan of the project.

2 This Plan has been prepared alongside the following documents, which are submitted under separate cover:

- Knockharley Landfill Ecological Impact Assessment Report (Scott Cawley Ltd., 2025a; hereafter referred to as "EIAR”).
- Knockharley Landfill Invasive Species Management Plan (hereafter referred to as “ISMP”; Scott Cawley Ltd., 2025b).
- Knockharley Landfill Construction and Environmental Management Plan (prepared by WSP, 2025; hereafter referred to as "CEMP”; submitted with the planning documentation).
- Knockharley Landscape and Visual Impact Assessment (Chapter 12 of the EIAR).

3 The Proposed Development covers an area of 135.2 ha and is predominantly comprised of land used for a landfill. The main habitats[1] present at the site are Spoil and bare ground (ED2), with areas of semi-natural woodland (WD1 and WD2) and Dry meadows and grassy verges (GS2). The site boundary is bordered by the linear habitat features including hedgerows (WL1) and drainage ditches (FW4). Currently, the only habitats of Local importance (Higher Value) within the Proposed Development are a Reed and large sedge swamp (FS1) in the southern portion of the site, the semi-natural woodlands, and Flemingstown Stream (FW2) which intersects the site at the northern boundary, and bounds around the eastern side of the site before joining with the River Nanny *c*. 3km downstream.

4 A detailed description of these habitats and the Proposed Development can be found within the EIAR (Scott Cawley Ltd., 2025a). A map illustrating the Proposed Development Redline Boundary and watercourses in its surrounding environment is shown in **Figure 1** below**.**

[1] Habitats described are as defined by Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*, Heritage Council, Kilkenny.


***Figure 1: Location of the Proposed Development and watercourses in the surrounding environment***

5 It is an objective of Meath County Council, as outlined in Volume 8 of the Meath County Development Plan 2021-2027[2] (HER POL 28) to "*integrate in the development management process the protection and enhancement of biodiversity and landscape features wherever possible, by minimising adverse impacts on existing habitats (whether designated or not) and by including mitigation and/or compensation measures, as appropriate*."

6 The purpose of this Biodiversity Management Plan is to address the management of natural features within the Proposed Development, the enhancement of natural features within the Proposed Development to provide a net gain in biodiversity, and to provide a practical and comprehensive document that can be referred to and consulted by the developer, and their appointed contractors, and the operator of Knockharley landfill such that the requirements of the Local Authority applicable policies and objectives are satisfied.

7 To date, there has been no formal legislative adoption or requirement for the delivery of Biodiversity Net Gain (BNG) in Ireland. This assessment has been carried out using methodology for assessing BNG in the UK where the Statutory Biodiversity Metric[3], the CIEEM guidance on Biodiversity Net Gain[4], and BS42020:20131 - Biodiversity: Code of practice for planning and development[5]. As BNG is a habitat-specific

[2] Meath County Development Plan 2021-2027, Volume 8 *Cultural and Natural Heritage Strategy* (2024). Meath County Council.

[3] DEFRA (2024). Statutory biodiversity metric calculation tool (macro enabled). Available online at: https://assets.publishing.service.gov.uk/media/669e4670ab418ab055592a23/The_Statutory_Biodiversity_Metric_Calculation_Tool_-_Macro_enabled_tool_23.07.2024.xlsm

[4] https://cieem.net/i-am/biodiversity-enhancement-approaches/biodiversity-net-gain/

[5] BSI (2013). BS42020:20131- Biodiversity: Code of practice for planning and development.

metric, additional management and/or enhancement measures will be provided to improve the site for fauna.

8 This document has also been prepared with reference to the All-Ireland Pollinator Plan guidance document on pollinator-friendly management for businesses.[6]

## 2 Scope of the assessment

9 This BMP covers the following:

- General mitigation measures for biodiversity, as outlined in the EIAR (Scott Cawley Ltd., 2025a)
- Areas of habitat set aside for biodiversity enhancement measures (see Section 4)
- BNG-specific enhancement measures
- Fauna-specific enhancement measures

10 Throughout this document the development is divided into distinct phases where biodiversity enhancement measures can be applied.

- Construction Phase refers to clearing and excavating of cells 31-40, and berm construction.
- Operational Phase refers to the infilling of waste in cells 31-40 as is currently undertaken in cells 15-26.
- Decommissioning Phase is the cessation waste disposal to cells 31-40 and the capping and remediation as is currently relevant to cells 1-14.

### 2.1 Assumptions and Responsibilities

11 Throughout this document where it is clear that the role of the ecologist is attached to the construction stage, the role is referred to as a "Suitably Qualified Ecologist (SQE)". The SQE will be retained by the operator of the Knockharley Landfill for a 5-year period post-implementation to assess habitat development and direct any corrective measures needed. All persons involved in the implementation and delivery of BNG and also landscape mitigation shall be competent, suitably trained and qualified as appropriate.

12 The implementation of biodiversity enhancement measures has been separated into Construction Phase and Decommissioning Phase measures. Construction Phase measures will involve habitat development where possible outside of the current landfill. Decommissioning Phase measures will be applied after once the landfill is capped and the remaining biodiversity measures can be implemented. No biodiversity measures are planned for implementation during the Operational Phase.

13 The Client and their appointed contractors will be responsible for the implementation of actions during the lifetime of the Proposed Development. The upkeep of all of the site's habitats that have been enhanced for biodiversity purposes or managed appropriately, e.g. mowing (through an agreed contractual agreement), will be handed over to the operator of Knockharley Landfill. It will also be the Client's responsibility to ensure monitoring is completed as described, by a SQE, and that this monitoring informs the management of the habitats within the site. The SQE will visit the site at the monitoring timeframes specified in this document to confirm if the biodiversity measures prescribed are being appropriately implemented, and having a positive effect as intended. Monitoring is to be completed as per the timeframes described in this BMP, by the appointed SQE, and this monitoring is to inform the management of areas set aside for biodiversity enhancement measures and retained habitats within the site. The results

[6] NBDC (2023) *All-Ireland Pollinator Plan, Guidelines 13. Businesses: actions to help pollinators*. National Biodiversity Data Centre Series No. 31.

of post-monitoring site visits in years 1, 3 and 5 post-construction will be reported back to the Meath County Council.

14 Due to the longevity of the project, changes to habitat and vegetation may occur. Prior to the Decommissioning Phase, a site assessment will be completed to map and establish any sensitive areas or changes in habitat on the site that may potentially be impacted upon during the Decommissioning Phase. Measures can then be taken to minimise any detrimental effects that may occur as appropriate.

### 2.2 Biodiversity Net Gain – Limitations and deviations from guidance

15 There is no statutory requirement for BNG in Ireland and no explicit guidance, although some local authorities have incorporated elements of BNG as policies and objectives in County Development Plans. This report relies on guidance from DEFRA and the British code of practice *BS42020:20131- Biodiversity: Code of practice for planning and development*.

16 Areas of baseline habitat used to inform the BNG assessment have been calculated using QGIS software, with the landscaping plan used as the basis for the post-intervention mapping developed using CAD software. All measurements that inform the calculations are therefore approximate but with care taken to be as accurate as possible between the two software packages.

17 The Biodiversity Metric has the following limitations associated with it, as set out in the technical guidance:

- The metric uses habitats as a proxy for biodiversity gain. Although this is a rational means of measuring biodiversity value, it is a simplification of complex ecological processes, which are not readily captured. While the scoring of habitats is informed by ecological reasoning and the available evidence, the outputs of biodiversity unit calculations are not scientifically precise or absolute values. Therefore, the generated biodiversity unit scores are a proxy for the relative biodiversity worth of a habitat. This is appropriate for a variety of intended uses, but there may be exceptional circumstances where use of the metric is not appropriate
- The metric and its outputs should therefore be interpreted, alongside ecological expertise, as an element of the evidence that informs plans and decisions. The metric is not a total solution to biodiversity decisions. It can determine new or restored habitat required post-development condition to compensate for habitat loss, but it does not inform the appropriate composition of plant species to use or which habitats might benefit locally important species
- The calculation of BNG is specific to habitats and does not account for fauna species. Enhancement measures for fauna will be provided separate from habitat enhancement

## 3 Ecological Baseline of Site

18 The Proposed Development consists of the expansion of the existing landfill site, with the construction of an additional void space of 3.38 million $m^3$ for landfilling and will be divided into landfill cells 31-40 for use over the next 21 years. Landfill cells 1-14 have been capped and planted in grassland (GS2). Landfill cells 15-26 are currently in use. Once landfill cells 31-40 have been capped, the site will be remediated. The site will still remain operational for the permitted Incineration Bottom Ash (IBA) facility and Biological Treatment Facility.

19 The management of field boundary habitat features within the project boundary (i.e. hedgerows, treelines and watercourses) are described in this section. The existing habitats recorded within the Proposed Development are illustrated in **Figure 2** and **Figure 3** below**.**

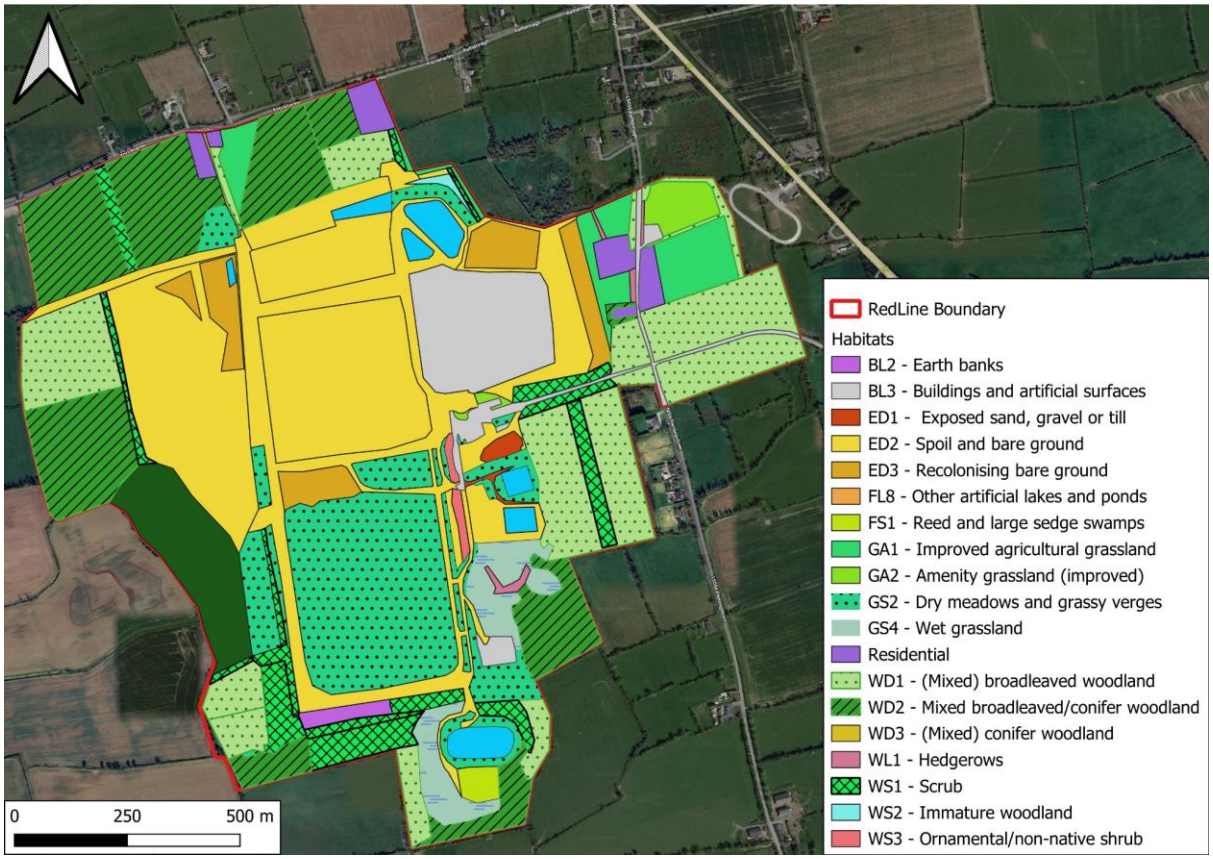


***Figure 2: Habitats (exclusive of linear features) recorded within the Proposed Development***

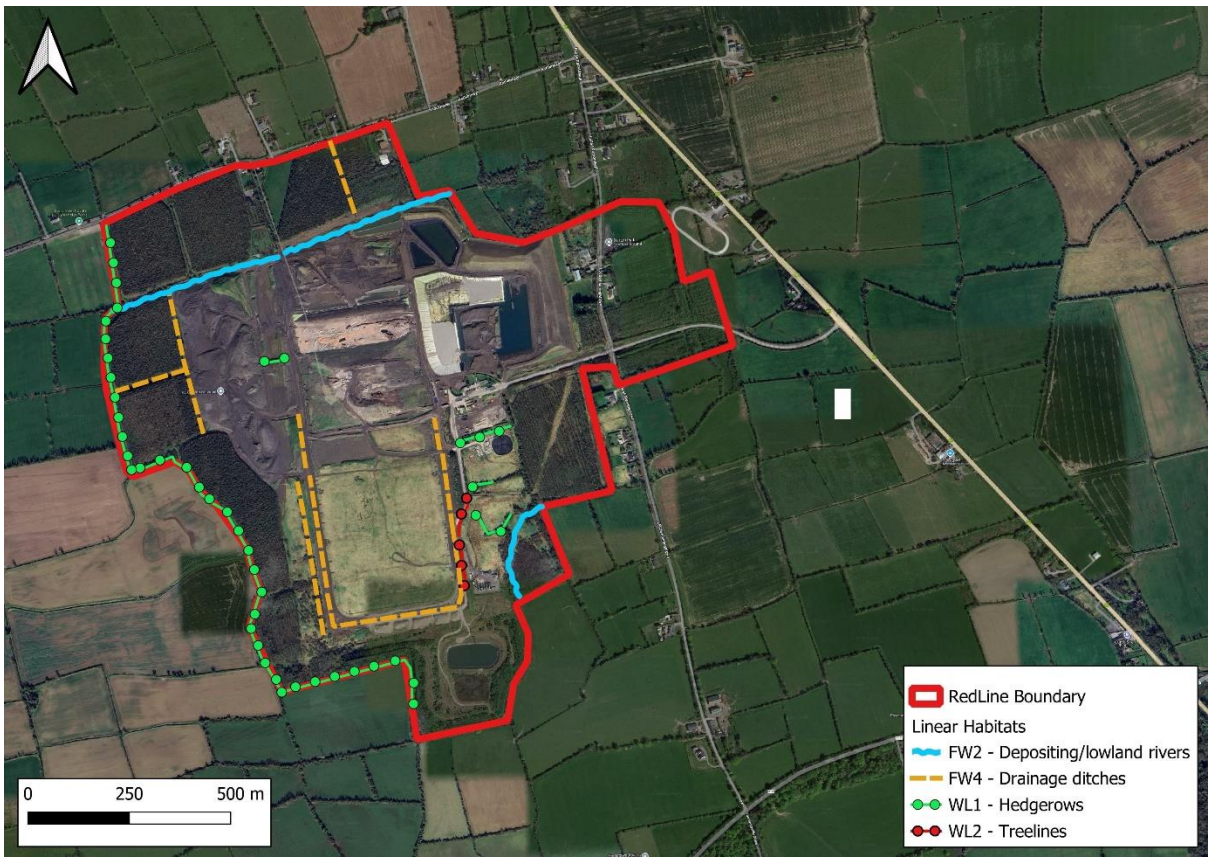


***Figure 3: Linear habitats recorded within the Proposed Development***

## 3.1 Area habitats

### *3.1.1 Area habitat baseline*

The majority of the area-based habitats are bare ground (ED2), Woodlands (WD1, WD2, WD3), grasslands (GA1, GA2, GS2, GS4) and Scrub (WS1). Bare ground habitat is located primarily in the landfill site and the surrounding tracks for heavy machinery. Woodland habitats are utilised as screening for the landfill and surround the perimeter of the site, and are all plantations of a mix of broadleaf or conifer species planted in rows. Agricultural grassland (GA1) is located primarily in the north and north-east of the site. The capped landfill is covered by a grassland meadow (GS2). At the south of the site, around the leachate plant, is wet grassland (GS4). Described in **Table 1** below is the valuation of area-habitats on site.

***Table 1: Baseline Area-based Habitat Calculations***

| Habitat Type (Fossitt) | Habitat Type (UKHab) | Distinctiveness | Condition | Total Area of habitat (Ha) | Biodiversity Units | Area retained (Ha) | Biodiversity Units Lost |
|---|---|---|---|---|---|---|---|
| ED2 | Bare ground | Low | Poor | 41.39 | 82.78 | 19.81 | 43.16 |
| WD2 | Other woodland; mixed | Medium | Good | 19.99 | 275.86 | 7.156 | 177.11 |
| GS2 | Other neutral grassland | Medium | Good | 18.15 | 250.47 | 1.849 | 224.95 |
| WD1 | Other woodland; broadleaved | Medium | Good | 20.09 | 184.83 | 12.784 | 67.72 |
| BL3 | Developed land; sealed surface | Very Low | N/A - Other | 10.03 | 0.00 | 0.431 | 0.00 |
| WD3 | Other coniferous woodland | Low | Moderate | 4.91 | 10.80 | 0 | 10.80 |
| WS1 | Willow scrub | Medium | Moderate | 4.82 | 42.42 | 1.295 | 31.02 |
| GA1 | Modified grassland | Low | Moderate | 4.18 | 16.72 | 0.144 | 16.14 |
| GS4 | Lowland calcareous grassland | High | Moderate | 3.68 | 44.16 | 1.58 | 25.16 |
| FL8 | Ornamental lake or pond | Low | Poor | 2.11 | 4.22 | 0 | 4.22 |
| GA2 | Modified grassland | Low | Poor | 1.31 | 2.62 | 0.04 | 2.54 |
| FS1 | Reedbeds | High | Good | 0.53 | 10.97 | | 10.97 |
| WS3 | Introduced shrub | Low | Condition Assessment N/A | 0.38 | 0.36 | 0 | 0.36 |
| | | | **TOTAL** | **131.57** | **937.01** | **45.08** | **614.15** |

## 3.2 Linear habitats

### *3.2.1 Linear habitat baseline*

20 Hedgerow (WL1) and treeline (WL2) habitats form an extensive network at the site boundaries, however there is a lack of connectivity across the site as the hedgerows and treelines are degraded, and many will be removed as part of the Proposed Development. Hedgerows within the project area are relatively species rich, and are dominated by spinose species such as *Crataegus monogyna, Prunus spinosa, Rubus fruticosus* agg. and *Rosa canina* agg., with a diversity of shrub and tree species present. The hedgerows on the site also have a well-developed understorey layer. Treeline habitats in the eastern part of the site consist of planted non-native *Cupressus* species, and native Ash *Fraxinus excelsior*, both of which lack well-developed ground flora. Described in **Table 2** below is the valuation of linear habitats on site.

21 ***Table 2: Baseline Linear-based Habitat Calculations***

| Habitat Type (Fossitt) | Habitat Type (UK Hab) | Distinctiveness | Condition | Total length of habitat (Km) | Biodiversity Units | Length retained (Km) | Biodiversity Units Lost |
|---|---|---|---|---|---|---|---|
| WL1 | Native hedgerow | Low | Poor | 0.129 | 0.30 | 0 | 0.30 |
| WL1 | Native hedgerow | Low | Poor | 0.133 | 0.30 | 0 | 0.30 |
| WL1 | Native hedgerow | Low | Poor | 0.086 | 0.20 | 0 | 0.20 |
| WL1 | Native hedgerow | Low | Poor | 0.046 | 0.11 | 0 | 0.11 |
| WL1 | Native hedgerow | Low | Moderate | 1.595 | 7.43 | 1.595 | 0.00 |
| WL2 | Line of trees | Low | Poor | 0.096 | 0.21 | 0.096 | 0.00 |
| WL2 | Line of trees | Low | Poor | 0.111 | 0.24 | 0.111 | 0.00 |
| | | | **TOTAL** | **2.196** | **8.70** | **1.802** | **0.91** |

## 3.3 Watercourse habitats

### *3.3.1 Watercourse habitat baseline*

22 The site is intersected by the Flemingstown Stream (FW2). This stream is in poor condition and due to the realignment of the stream much of the riparian vegetation has been removed and the stream structure has been heavily modified.

23 Drainage ditches (FW4) across the site occur at field margins and are associated with standing water. Vegetation within this habitat is variable and has a generally poor species diversity. Described in **Table 3** below is the valuation of watercourse habitats on site.

***Table 3: Baseline Watercourse-based Habitat Calculations***

| Habitat Type (Fossitt) | Habitat Type (UK Hab) | Distinctiveness | Condition | Total length of habitat (Km) | Biodiversity Units | Length retained (Km) | Biodiversity Units Lost |
|---|---|---|---|---|---|---|---|
| FW2 | Other rivers and streams | High | Poor | 0.848 | 5.86 | 0.848 | 0 |
| FW2 | Other rivers and streams | High | Poor | 0.256 | 1.77 | 0.256 | 0 |
| FW4 | Ditches | Medium | Poor | 0.093 | 0.67 | 0.093 | 0 |
| FW4 | Ditches | Medium | Poor | 0.495 | 0.37 | 0.495 | 0 |
| FW4 | Ditches | Medium | Poor | 0.123 | 1.98 | 0.123 | 0 |
| FW4 | Ditches | Medium | Poor | 0.340 | 0.49 | 0.340 | 0 |
| FW4 | Ditches | Medium | Poor | 0.391 | 1.36 | 0.391 | 0 |
| FW4 | Ditches | Medium | Poor | 0.178 | 1.57 | 0.178 | 0 |
| FW4 | Ditches | Medium | Poor | 0.06 | 0.71 | 0.06 | 0 |
| FW4 | Ditches | Medium | Poor | 0.266 | 0.28 | 0.266 | 0 |
| FW4 | Ditches | Medium | Poor | 0.287 | 1.07 | 0.287 | 0 |
| | | | **TOTAL** | **3.51** | **17.29** | **3.51** | **0** |

## 4 Areas set aside for Biodiversity Enhancement

Separate from general mitigation measures and landscape planting management, much of the site will be available for biodiversity enhancement (**Figure 4**), with the exception of the proposed IBA facility, Biological Treatment Facility, and the current buildings and roads located on site. Following the BNG mitigation hierarchy (**Retention** > **Enhancement** > **Creation**), the area set aside for biodiversity enhancement is divided based on this hierarchy. This area is based on the final landscape plan once landfill cells 31-40 are capped. The area available equates to *c.* 110ha, and consists of:

- 43ha of habitat which will be retained with no further enhancement applied.
- 4ha of habitats which already exist and will be enhanced.
- 63ha of habitats which will be created.

24 These areas and their prescribed management and monitoring are described separately below and are illustrated in

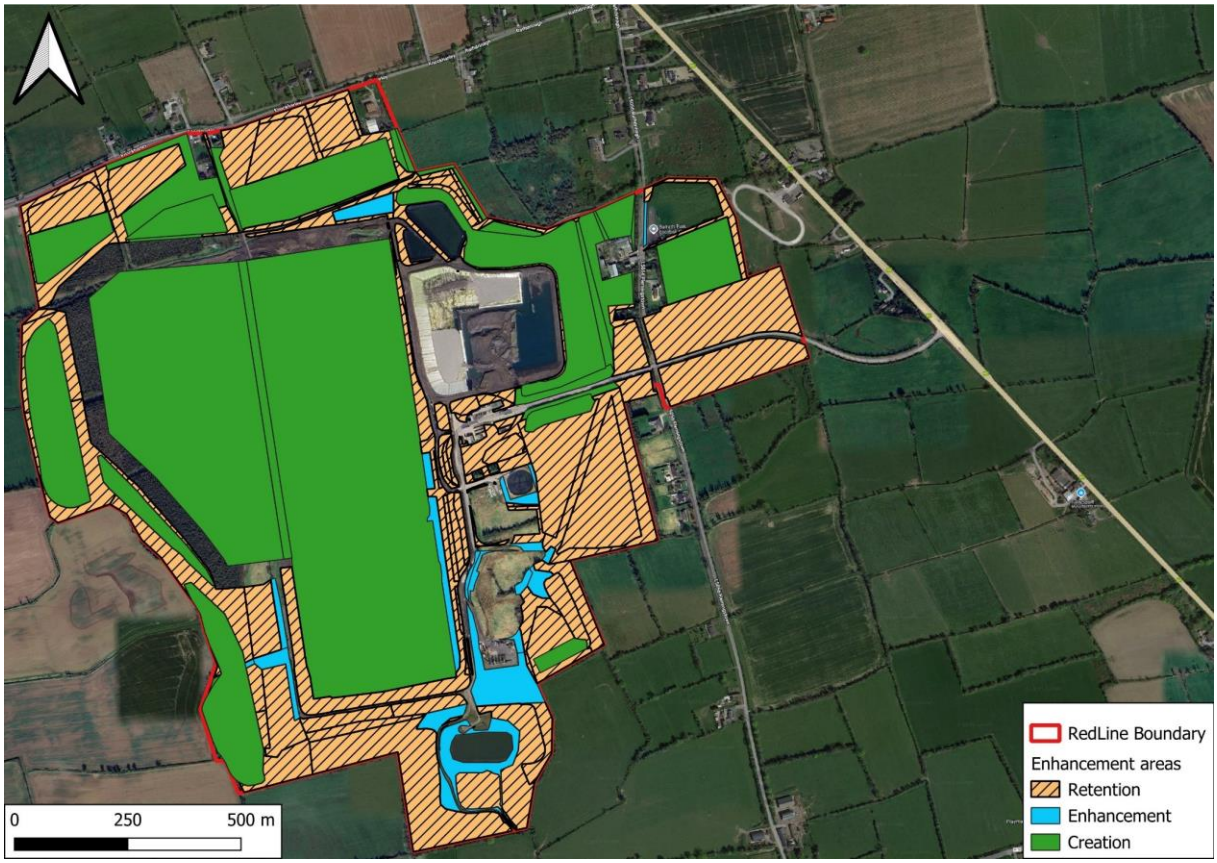


Figure 4. The Biodiversity Enhancement measures that follow will be included in the LMP to be developed during construction and decommissioning of the Proposed Development.

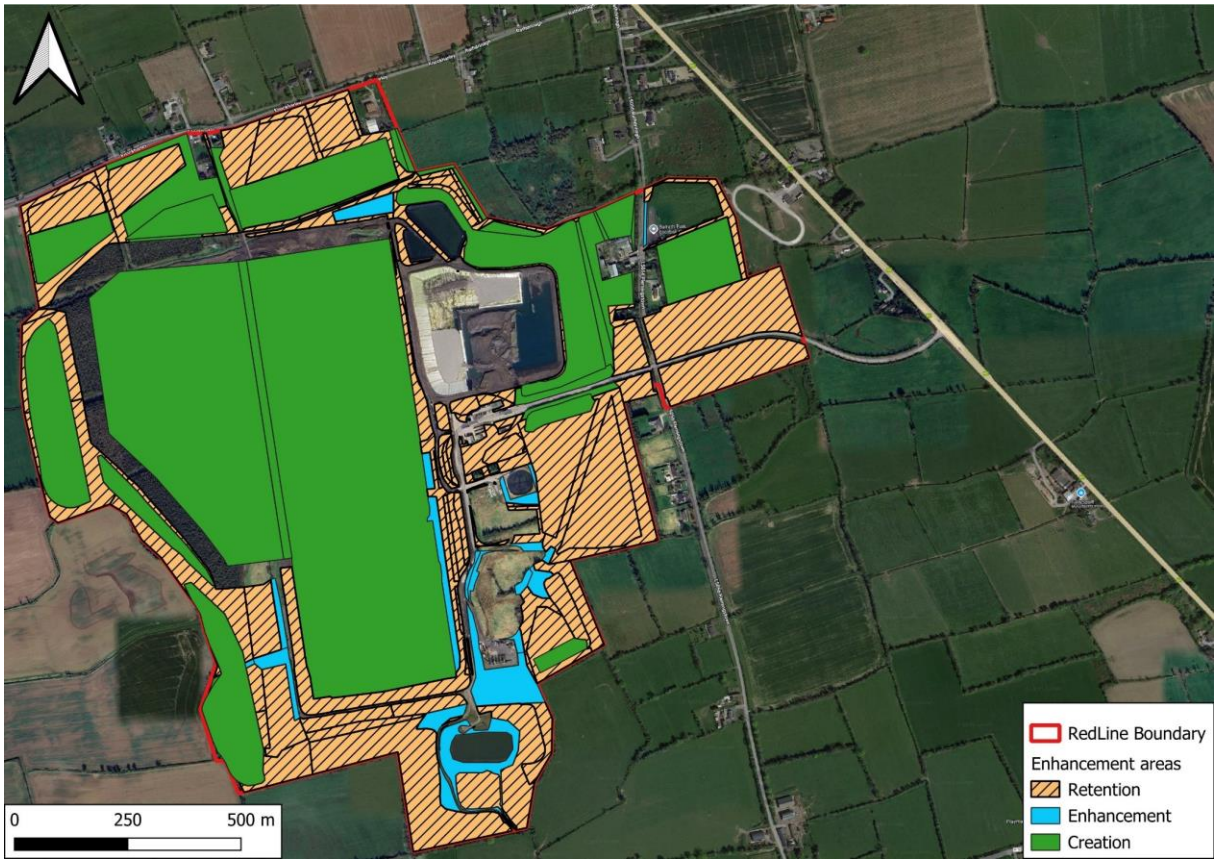


***Figure 4: Areas set aside for biodiversity enhancement at the Proposed Development***

### 4.1 Area habitats - Enhancement

27 The objectives for enhancement of area habitats is to:

- Establish species-rich grassland meadows on the future landfill caps and enhance existing grassland.
- Retain and enhance existing woodland and scrub.
- Replace lower value conifer woodland with high-value broadleaved species.
- Increase woodland area.

28 As set out in the ISMP and CEMP (Scott Cawley Ltd., 2025b; WSP, 2025 respectively), a pre-construction invasive species survey will be carried out by the invasive species specialist to inform any required updates to and finalise the practical eradication measures for the identified species in the ISMP. Site biosecurity measures as outlined in the CEMP and ISMP will be implemented as appropriate, to prevent the possible spread of non-native invasive species.

29 Annual monitoring of grassland habitat will be undertaken for a 5-year period post implementation by an SQE to monitor establishment.

#### *4.1.1 Grasslands*

30 ***Grassland habitat creation and enhancement***

31 The capped landfills are calculated to cover 40ha of land, and will be reverted to neutral grassland in the following way:

- Sowing of an appropriate native wildflower seed mix in Autumn or Spring, with seed rolled to give good soil contact. Seed sources must only contain native Irish species. As per the proposed and Landscape Management drawings (Appendix I), It is proposed that the design will include native flower and grass species (See Appendix II for Species rich meadow grassland for enhancement of Dry meadows and grassy verges (GS2), and Wet Grassland meadow mix for enhancement of Wet Grassland (GS4)).
- Cut and lift in first year following sowing in early August. Earlier cutting will not be undertaken allowing initial weed growth to protect young seedlings through Spring/Summer. All arisings in first year will be raked off and removed from the site for composting.
- The addition of semi-parasitic plants such as yellow rattle *Rhinanthus minor* from a local seed source or from a reputable native seed supplier (e.g. "*Irish Wildflower Showcase*"[7]) may be considered in the areas of existing grassland (GS2) to reduce grass dominance.

32 ***Grassland habitat management***

33 Following establishment, grassland will be subject to the following generalised management regime, with options set out below to adapt management as required:

- In the first years of establishment, created grassland will be monitored by the SQE to determine the need for and extent of any management required to reduce the cover of invasive ruderal species.
- Annual cut of the wildflower meadow will be targeted for mid-July & September (timed subject to weather conditions to maximise) to no lower than 200mm. Leave arisings for 1-7 days to allow seeds to drop. Cut vegetation should be harvested 3-5 days after mowing to allow the seed to shed and to reduce the nutrient load on these areas.

[7] Irish Wildflower Showcase website: http://www.wildflowers.ie/

- Monitoring by the SQE will track the presence and extent of non-native species and undesirable species, and will trigger remedial action where necessary to remove or reduce their presence
- Second cut from September onwards, again with all cuttings subsequently removed as above.
- Timing of cutting should be adapted accordingly subject to the results of ecological monitoring by the SQE, including identification of key flora (e.g. later flowering species) or presence of notable species.
- Rotational cutting (maximum biannual) will be implemented to keep nutrient levels are sufficiently low in soil such that botanical diversity will be maintained.
- In subsequent years, the grassland should be managed as traditional hay meadows to maintain species diversity.
- From year two onward *c*. 1/3 of the open grassland areas will be subject to reduced management. These areas will be cut on rotation once every three years to create a dense tussock structure that will benefit wildlife.

The creation of this habitat will change the current habitat type from Bare ground (ED2) to Dry meadows and grass verges (GS2), and increases the Biodiversity Units from the baseline of 117.61 to 407.33 post-implementation.

### *4.1.2 Woodlands*

34 ***Woodland habitat creation and enhancement***

35 Of the current forest, 65% (29.5ha) will be retained. The construction of berms as part of the Proposed Development will result in the loss of 12.9ha of existing woodland. Compensatory planting will be required for forest felled. A total of 12.9ha of forestry will be removed as part of the construction phase. There is not sufficient land within the Proposed Development to plant compensatory forest habitat, therefore 4.04 ha of land has been sourced offsite to meet the requirements of the felling licence. In total, it is planned for 8.86ha of woodland is to be planted around the perimeter of the berms and landfill, and in other locations within the Proposed Development and in off-site locations to compensate for this loss.

36 It is proposed that the woodland species mix will include species characteristic of WD1 (Mixed) broadleaved woodland. Woodland creation and enhancement will target the following:

- Planting mixes within newly created areas of woodland will be designed to comprise of at least 5 appropriate native species and clump planted to create diversity in structure, unplanted gaps will be left to infill naturally.
- As woodland establishes there should be a diverse age range and vertical structure of trees with evidence of natural regeneration, a scrub layer and woodland canopy.
- Woodland edges will provide graded habitat either through the interface with scrub habitat or through the creation of coppiced/pollarded woodland margins.
- Regular monitoring by the SQE will track the presence and extent of non-native species and undesirable species, and will trigger remedial action where necessary to remove or reduce their presence
- Standing and fallen deadwood >20cm diameter and >1m tall/long to be retained within woodland where feasible.

37 There will be planting variation in which tree species are planted in groups of varying clump/block size and spacing between trees creating gradients of different planting densities across the site. The aim will be to create mixed deciduous woodland comprised of only native species. As per the Landscape Management drawings (Appendix I), it is proposed that the design will include native tree species including: pendunculate oak *Quercus rubor*, Scot's pine *Pinus sylvestris*, alder *Alnus glutinosa*, downy birch *Betula pubescens*, and wild cherry *Prunus avium* (See Appendix I for locations).

38 Scrub planting referred to below will be used to create a graded woodland edge between woodland and grasslands, adding further value to the woodland belts.

39 Furthermore, where practical and where no health and safety issues arise, it is proposed to retain old, dying and dead trees, when possible, to keep standing deadwood habitat. This may provide suitable shelter for bats and where it falls, may also form of hibernacula for amphibians[8] and various invertebrates.

40 The loss of 133.6 woodland Biodiversity Units will be compensated for with 299.6 woodland Biodiversity Units both retained and created.

41 ***Woodland Management***

42 Following establishment, woodland will be subject to the following generalised management regime, with options set out below to adapt management as required:

- Monitoring by the SQE will be made during the first five years of establishment to replace dead or diseased specimens, control weeds, re-stake plants as necessary and check deer fencing. Thereafter checks will be made once every two years during spring.
- Any re-planting will be undertaken November to February.
- All non-invasive weed growth will be controlled using mechanical means, such as strimming. Chemical treatments are to be used only as a last resort.
- Managing the shrub layer by annual cutting to create woodland thicket and increase flowering/fruiting.
- The use of coppicing and pollarding should seek to promote the diversity of 'edge' habitat at woodland boundaries, cutting up to 20m continuous sections from 0.5m to canopy height on rotation every 3 – 5 years.
- Thinning operations will be minimal including annual winter checks from year six onwards.
- Target the creation of clearings in combination with thinning operations in larger woodland areas. Clearings can vary in scale and their location. Clearings should be seeded with a suitable woodland meadow mix.
- Unless diseased, deadwood created through management should be retained either as standing or fallen boughs in situ or made into habitat piles.

#### 4.1.2.1 Ash Die Back Pathogen

43 Habitat surveys noted locally a high percentage of ash *Franxinus excelsior* in screening forests around the Proposed Development, which could result in the decline of the woodland owing to the potential for Ash dieback.

44 It is recommended that the current ash forest remain in place, as it is established and the other species intermixed with the ash will remain if the ash trees die. However, ash must not be included in the new planting regime.

### *4.1.3 Scrub*

***Scrub habitat creation and enhancement***

45 Scrub (WS1) exists throughout the site but is primarily located adjacent to the screening forests around the site. None of the existing scrub habitat will be lost to the Proposed Development, with 4.12ha of the existing scrub habitat retained and a further 0.47ha enhanced. Currently this 0.47ha of scrub is in poor

[8] Baker, J., Beebee T., Buckley, J., Gent, A. and Orchard, D. (2011). *Amphibian Habitat Management Handbook*. Amphibian and Reptile Conservation, Bournemouth.

condition due to dominance of bramble, and will be enhanced with removal of bramble and the planting of grey willow *Salix Cineria,* gorse *Ulex europaeus,* and hawthorn *Crataegus monogyna,* providing cover and additional food sources for fauna. The installation of power pylons will result in the felling of 1.92ha of woodland (WD1), which will be replaced with scrub habitat planted under the pylons.

Scrub creation and enhancement will consider that:

- There is a good age range – all of the following are present: seedlings, young shrubs and mature shrubs.
- There is an absence of invasive non-native species and undesirable species make up less than 5% of ground cover.
- There are at least three woody species, with no one species comprising more than 75% of the cover.
- There are clearings present within the scrub, providing sheltered edges.
- The scrub has a well-developed edge with scattered scrub and tall grassland and/or herbs present between the scrub and adjacent habitat(s).

46 Scrub is of greatest value to wildlife where it forms a scattered patch work/network, which provides ample edge habitat. Planting of scrub with gentle transitions to surrounding grassland provides a more natural vegetation structure and tends to give better results for invertebrates. Therefore, scrub planting should be maintained to ensure that it grades into more open habitats.

47 The creation and enhancement of the scrub habitats will result in the improvement of 57.03 scrub Biodiversity Units.

48 ***Scrub management***

49 Following establishment, scrub will be subject to the following generalised management regime, with options set out below to adapt management as required:

- Management should seek to maintain a variable age structure, through rotational cutting and thinning.
- Management operations to create open spaces such as clearings on rotation. These provide a wide range of conditions and niches suitable to maintain the lifecycles of the species present, providing a diverse interface between habitats.
- Targeted treatment of any invasive species or pernicious weeds, to be undertaken mechanically or using spot treatment performed by a licensed individual.
- Allow the development of an edge habitat with a gentle transition between grassland and scrubland, through reduced management of grassland in proximity to the scrub.
- Create a graded grassland/scrub interface. This can include cutting bramble and shrub vegetation at varying angles to the vertical to also increase the overall surface area.

### 4.2 Linear habitats - Enhancement

50 The objectives for enhancement of linear habitats is to:

- Maintain and enhance retained native flowering hedgerows and mature treelines within the site.
- Provide additional hedgerows to act as a food and shelter resource.
- Improve habitat connectivity for fauna species.

#### *4.2.1 Hedgerows*

51 ***Hedgerow creation and enhancement***

52 The Proposed Development will result in the removal of 393m of hedgerows in various locations across the site. Each of these hedgerows is degraded and fragmented, and are of poor quality. To compensate for this loss it is proposed to create c. 1.5km of new hedgerows to provide connectivity across the site, and to enhance the existing c. 3km of hedgerows around the site boundary.

53 New trees and hedgerow shrubs (including infill planting) will be planted as per the instructions below:

- All new planting will be prepared and maintained in accordance with good horticultural practice to ensure the thriving of individual species.
- All new native transplants should be protected with proprietary rabbit guards or shrub shelters.
- Sufficient watering will be undertaken by the contractor to establish and maintain healthy plant growth.

Retained and newly created hedgerows will be managed to achieve the following condition criteria:

- Continuous lengths of hedgerow supporting at least five native shrub species per 30m by year five.
- Bushy A-section shaped hedges achieving a height and width >1.5m average along the length of the hedgerow.
- >1m width of undisturbed ground with perennial herbaceous vegetation for >90% of length measured from outer edge of hedgerow, and is present on at least one side of the hedgerow.
- All hedgerows are free of invasive non-native species.

54 As per the Landscape Management drawings (Appendix I), it is proposed that the design will include native[9] hedgerow planting and include the following species; hawthorn *Crataegus monogyna,* blackthorn *Prunus spinosa,* holly *Ilex aquifolium,* guelder rose *Viburnum opulus,* hazel *Corylus avellana,* dog rose *Rosa canina, and* spindle *Euonymus europaeus* (See Appendix I for locations). Other native species that could be considered and may be locally used to reinforce/bolster hedgerows include: alder *Alnus glutinosa,* honeysuckle *Lonicera periclymenum,* crab apple *Malus sylvestris,* bird cherry *Prunus padus,* elder *Sambucus nigra,* and rowan *Sorbus acuparia*.

55 The creation and enhancement of the hedgerow habitats will result in an improvement of 45.10 hedgerow Biodiversity Units.

56 ***Hedgerow management***

57 Following establishment, the hedgerow will be monitored for any sign of poor health annually. Any signs of ill health or damage will be noted by the SQE, and remedial action taken when required.

58 Once established, a 3-year rotational cutting regime of all hedgerows will be undertaken, with the hedges cut (flailed) at 45° to a minimum height of 3m in October-December with the exception where growth impedes maintaining safety sightlines. This will ensure there are always some hedgerows supporting dense leaf cover and berries at the site, whilst allowing the hedgerow to form sufficient older growth necessary for many species to flower and fruit. Hedgerows will be maintained as per the prescriptions below:

- Hedgerows should ideally be shaped into a triangular 'A-shaped' profile to encourage dense growth at ground level.
- Hedgerow cutting should be undertaken in January or early February, when possible, to provide a winter food source to wildlife.
- Hedgerows are not to be left untrimmed for more than the three years as the woody growth will become too thick to be trimmed cleanly.

[9] Locally sourced in as far as possible, and not horticultural variants from outside Ireland as detailed in the LMP.

59 Where remediation planting is not successful following monitoring, hedgerow laying may be considered to rejuvenate areas of gappy or damaged hedgerows. Hedge laying involves cutting the stems part of the way through, bending them over and interweaving them. This will also be undertaken in short sections as it takes time to provide habitat for fauna.

### 4.3 Watercourse habitats - Enhancement

60 The objectives for enhancement of watercourse habitats is to:

- Enhance watercourses at the site in terms of water quality and biodiversity.

#### *4.3.1 Watercourses*

61 Flemingstown Stream has been recently diverted and the existing embankment canalised, significantly affecting the natural characteristics of the waterway. It is proposed that riparian planting be established along the watercourse, providing an riparian buffer zone to improve the biodiversity value of the stream. Currently, Flemingstown Stream has been assessed as 'Poor' quality (WFD River Waterbody Status 2016 - 2021[10]). The riparian buffer zone will potentially mitigate nutrient run-off from the site and improve water quality within the stream. While the riparian buffer may assist in nutrient mitigation from the Proposed Development, it cannot mitigate for contaminated run-off from agricultural land which the Flemingstown Stream passes through upstream and downstream of the site.

62 The creation and enhancement of the watercourse habitats will result in an improvement of 6.98 watercourse Biodiversity Units.

63 ***Riparian habitat creation***

To improve the ecological value of Flemingstown Stream, the following measures will be implemented:

- The provision of riparian buffer zones, in as far as is practical, along the stream (10m centred on a stream, 5m centred on a ditch).
- Riparian planting will consist of interspersed planting of woodland species and grassland meadows.
- For woodland species, planting of single or small irregular groups of native trees/native riparian species (such as grey willow, gorse, hazel, alder) at strategic areas along the riparian setback.
- For grassland species, sowing of a native riparian species described in the Wetland areas section of Appendix II.

***Riparian habitat management***

64 Following establishment, the riparian buffer will be monitored for any sign of poor health annually. Any signs of ill health or damage to trees will be noted by the SQE, and remedial action taken when required. The created grassland would be monitored to determine the need for and extent of any management required to reduce the cover of invasive ruderal species. The riparian buffer will be subject to the following generalised management regime, with options set out below to adapt management as required:

- The riparian buffer zone along watercourses will be maintained with minimal cutting and no overplanting is prescribed except where construction activities such as along the access culvert emplacement require it. Full details of the reseeding shall be included in the landscape management plan.
- No fertiliser application will be permitted. Post-sapling growth-stage trees will be planted that will not need to compete with ground flora.

[10] EPA (2022) WFD River Waterbody Status 2016 - 2021

- Grassland habitats within the watercourse buffer zones should be managed as outlined in section 4.1.1 above.
- Sprays, fertilisers and major disturbances shall be avoided in areas close to watercourses and ditch banks as these can easily run-off into and pollute the water, and disturb and/or damage important habitats for wildlife.
- Riparian buffer zones for watercourses and drainage ditches should be managed as for species-rich grassland e.g. 1-2[11] annual cuts.

65 Specifically, riparian planting would also improve the ecological quality of watercourses (e.g., through nutrient inputs, thermoregulation, erosion reduction), create shelter opportunities (e.g., for otter), establish improved habitat corridors (e.g., for bats) and provide shading to watercourses and a source of nutrient inputs and aiding in temperature regulation and cover for fish. The planting proposals across various Biodiversity Units would also benefit black grouse through enhanced shelter and foraging habitats and the connectivity of the Biodiversity Units locally.

## 5 Post-Development landscape

66 As determined by the BNG calculations, the post-development landscape will provide an additional 347.89 Biodiversity units, and result in a net gain for all habitat types (Area: 42.26%; Hedgerows: 373.59%; Watercourse: 40.40%). The habitats planned to create this net gain in biodiversity are shown in **Figure 5** and **Figure 6**. The calculations demonstrating the enhancement are detailed below in Section 5.1 (Area habitats), Section 0 (Hedgerow habitats) and Section 5.3 (Watercourse habitats).

[11] NBDC: https://biodiversityireland.ie/practical-advice-on-managing-wildflower-meadows/#:~:text=Cut%20and%20lift%20meadow%20areas,best%20in%20less%20fertile%20soil).

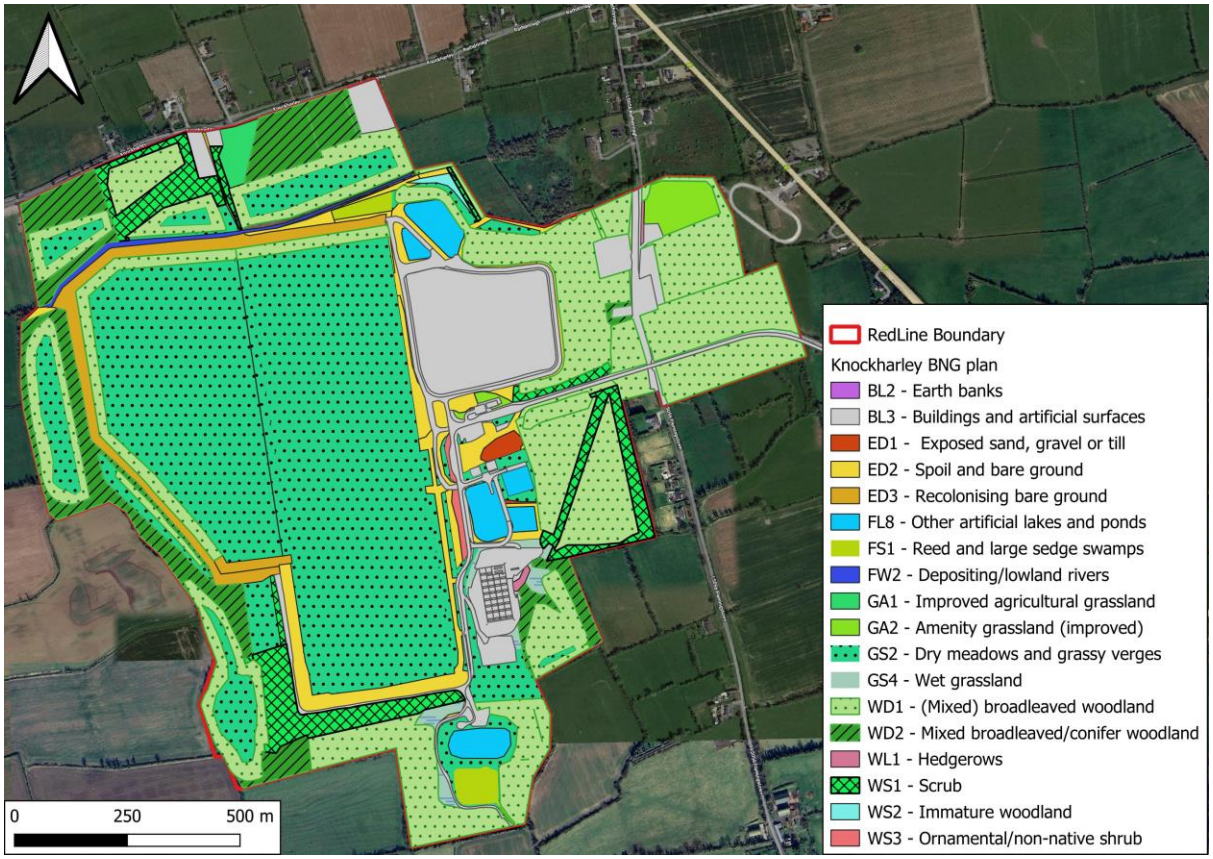


***Figure 5: Post-Development habitats (exclusive of linear features) at the Proposed Development***

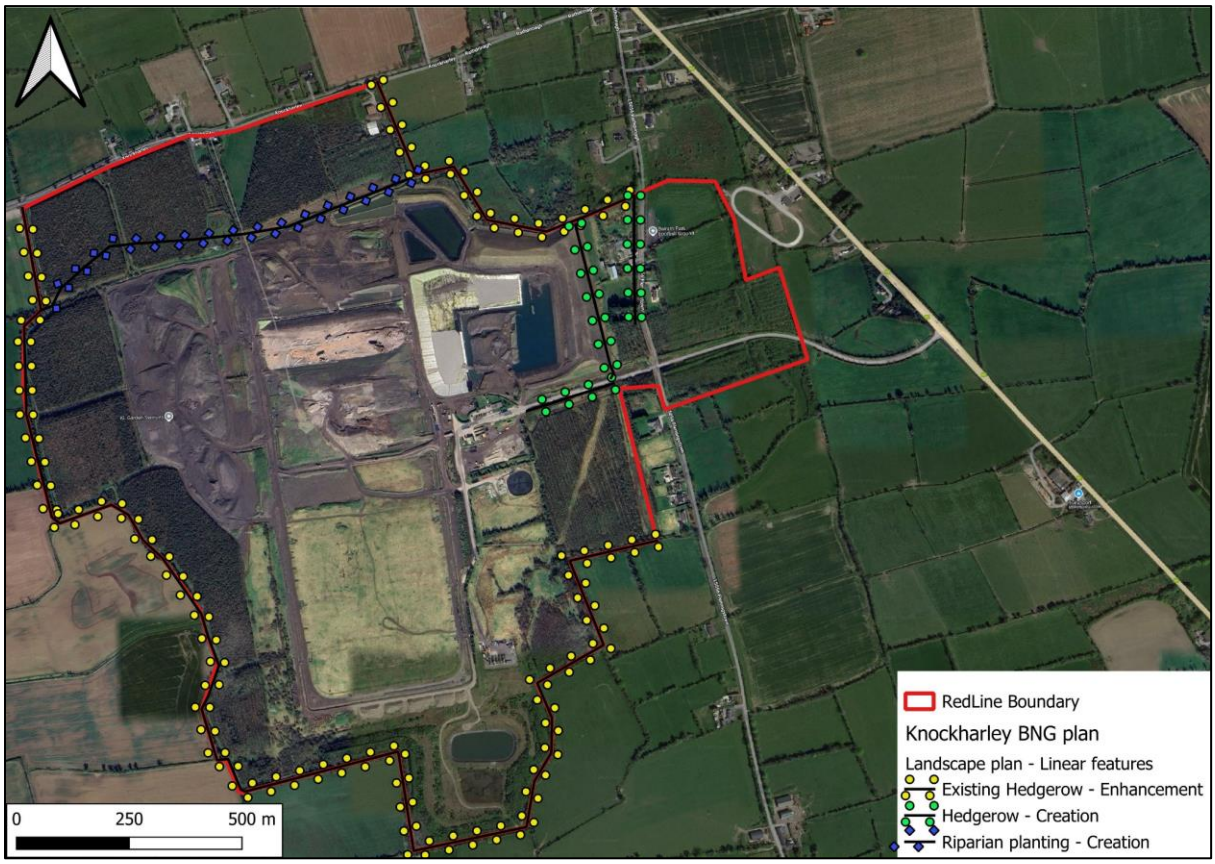


***Figure 6: Post-Development linear habitats at the Proposed Development***

### 5.1 Area habitat enhancement

67 The landscape plan provides an additional 324.22 Habitat units over the baseline, and yields a 38.17% net gain in area-based habitat biodiversity **(Table 4).**

***Table 4: Post-intervention Area-based Habitat Calculations***

| Habitat Type (Fossitt) | Habitat Type (UKHab) | Area retained (Ha) | Area enhanced (Ha) | Area created (Ha) | Biodiversity Units |
|---|---|---|---|---|---|
| ED2 | Bare ground | 19.81 | 0 | 0 | 39.62 |
| WD2 | Other woodland; mixed | 7.156 | 0 | 0 | 117.61 |
| GS2 | Other neutral grassland | 0 | 18.15 | 36.73 | 724.65 |
| WD1 | Other woodland; broadleaved | 12.784 | 0 | 14.64 | 182.03 |
| WS1 | Willow scrub | 5.692 | 0.47 | 0.539 | 58.89 |
| GA1 | Modified grassland | 4.04 | 0 | 0 | 16.16 |
| GS4 | Lowland calcareous grassland | 0 | 1.583 | 0 | 24.37 |
| FL8 | Ornamental lake or pond | 1.416 | 0 | 0 | 2.832 |
| GA2 | Modified grassland | 0.04 | 0 | 0 | 0.08 |
| FS1 | Reedbeds | 0.53 | 0 | 0.347 | 14.10 |
| WS3 | Introduced shrub | 0.18 | 0 | 0 | 0.36 |
| | **TOTAL** | **59.19** | **20.20** | **46.54** | **1023.47** |

### 5.2 Linear habitat enhancement

68 The landscape plan provides an additional 45.10 Hedgerow units over the baseline, and yields a 373.59% net gain in hedgerow-based biodiversity **(Table 5).**

***Table 5: Post-intervention Linear-based Calculations***

| Habitat Type (Fossitt) | Habitat Type (UKHab) | Length retained (Km) | Length enhanced (Km) | Length created (Km) | Biodiversity Units |
|---|---|---|---|---|---|
| WL1 | Native hedgerow | 0 | 1.595 | 0 | 25.32 |
| WL2 | Line of trees | 0.096 | 0 | 0 | 0.21 |
| WL2 | Line of trees | 0.111 | 0 | 0 | 0.24 |
| WL1 | Native hedgerow | 0 | 0.733 | 0 | 11.64 |
| WL1 | Species-rich native hedgerow | 0 | 0 | 0.179 | 1.61 |
| WL1 | Species-rich native hedgerow | 0 | 0 | 0.253 | 2.28 |

| | | | | | |
|---|---|---|---|---|---|
| WL1 | Species-rich native hedgerow | 0 | 0 | 0.315 | 2.83 |
| WL1 | Species-rich native hedgerow | 0 | 0 | 1.448 | 13.03 |
| | **TOTAL** | **0.207** | **2.328** | **2.195** | **57.16** |

### 5.3 Watercourse habitat enhancement

69 The landscape plan provides an additional 6.98 Watercourse units over the baseline, and yields a 40.40% net gain in hedgerow-based biodiversity **(Table 6).**

***Table 6: Post-intervention Watercourse-based Calculations***

| Habitat Type (Fossitt) | Habitat Type (UK Hab) | Length retained (Km) | Length enhanced (Km) | Length created (Km) | Biodiversity Units |
|---|---|---|---|---|---|
| FW2 | Other rivers and streams | 0 | 0.848 | 0 | 5.86 |
| FW2 | Other rivers and streams | 0.256 | 0 | 0 | 1.77 |
| FW4 | Ditches | 0 | 0.168 | 0 | 0.67 |
| FW4 | Ditches | 0 | 0.093 | 0 | 0.37 |
| FW4 | Ditches | 0 | 0.495 | 0 | 1.98 |
| FW4 | Ditches | 0 | 0.123 | 0 | 0.49 |
| FW4 | Ditches | 0 | 0.340 | 0 | 1.36 |
| FW4 | Ditches | 0 | 0.391 | 0 | 1.57 |
| FW4 | Ditches | 0 | 0.178 | 0 | 0.71 |
| FW4 | Ditches | 0 | 0.068 | 0 | 0.28 |
| FW4 | Ditches | 0 | 0.266 | 0 | 1.07 |
| | **TOTAL** | **0.256** | **3.26** | **0** | **17.29** |

## 6 Maintenance

A regular programme of landscape maintenance will ensure the establishment and continued growth of the planted and seeded areas. This establishment programme will include:

- Maintenance of a weed free area 1m in diameter around the stems of all new tree plantings until the canopy closes and weed growth no longer competes with the woodland planting.
- Checking stakes, shelters and tree ties on woodland, trees and hedgerow plants to ensure they remain effective in protecting young plantings and are not rubbing on bark.
- Removal of stakes, shelters and tree ties when new planting is fully established and able to withstand grazing by deer, rabbits and hares.
- Lightly trimming new hedgerow in the first three years after planting to encourage lateral growth and create bushy plants.
- Cutting existing and fully established hedgerows every three years (between September 1st and February 28th) to maintain a height of between 2-4m.

- Mowing the new areas of grassland twice in the first two growing seasons in spring and autumn. Thereafter, mowing the established grassland annually in autumn, collecting and removing the cuttings.

70 Chemical inputs (i.e. fertilizer and pesticide use) will be minimised. Herbicide use should only be used when necessary, in the control of invasive species, as set out in the ISMP (Scott Cawley Ltd., 2025b).

71 Field margins shall be monitored for a 5-year period post implementation by a SQE to be retained by the operator of the Knockharley Landfill, to assess the need for additional planting remediation. Any remediation works will be designed in co-operation with a landscape contractor and undertaken in a timely manner.

## 6.1 Fauna Enhancements

72 Enhancement measures for fauna species are described in this section, however it should be noted that these measures are not included in the BNG calculations as they cannot be quantified. Nevertheless, these measures will provide additional support for biodiversity across the site.

### *6.1.1 Refugia*

73 Separate from but potentially enhancing the habitat for fauna, log piles are relatively simple structures that are known to provide refuge and food for many fauna and fungal species. They may comprise clusters of logs clustered together, or they may be constructed. Either way they are relatively simple structures, as illustrated below in **Figure 7** and **Figure 8**. Ideally, they would be located at undisturbed edges of treeline or hedgerow habitats.

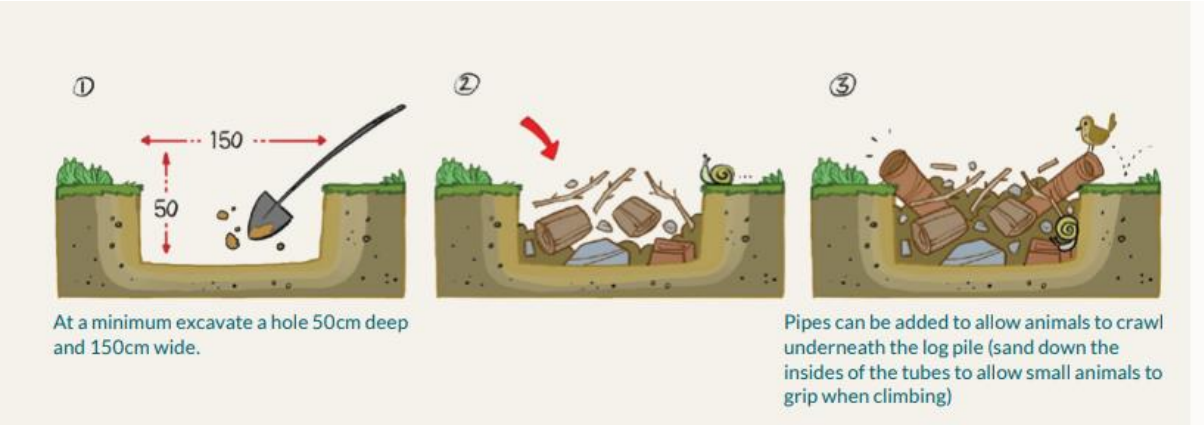


***Figure 7. Illustration of log pile construction sequence[12]***

[12] Gardening for Biodiversity. Available at: https://laois.ie/wp-content/uploads/Garden-Wildlife-Booklet-WEB-17MB.pdf

***Figure 8. Photograph of finished log pile, with surrounding established vegetation.***

### *6.1.2 Hibernacula*

74 Similar in part to log piles, hibernacula are established design mitigation features for amphibians and reptiles (see **Figure 9**). They are places where both amphibians and reptiles can overwinter. There was evidence of common frog on site. There was no evidence of common lizard or smooth newt recorded on site, although there is open habitat potentially suitable for common lizard within the Proposed Development. The desktop surveys revealed no records of common lizard in close proximity of the Proposed Development.

75 The following is provided for reference only and is not necessarily recommended at this stage for implementation at the Proposed Development, owing to the level and extent of construction-related disturbance and the absence of the species. However, it may be something that in future years, following monitoring, might be successfully implemented. Hibernacula are typically constructed in shallow topographical depressions (well-draining soils) from remnant building blocks (as the base layer), but typically logs covered with woodchip and soil, which provides plenty of internal voids for animals to shelter in. It is recommended to cover the structure in grass sod to provide a constant internal temperature. In respect of amphibians, the open face of the hibernaculum is typically pointed in the direction of the adjacent water feature that they would utilise.

***Figure 9. Example of a constructed hibernacula. In some instances, the top is covered in grass sod to further disguise it from potential intrusion of people[13].***

[13] Image from Froglife.org

76 These features would ideally be located in the biodiversity enhancement areas and within the buffer zones of drainage ditches, and designed in cooperation with the landscape designer so as to ensure longer term benefit in these areas.

#### *6.1.3 Nesting habitat for Wild bees*

Ireland is home to 62 species of mining solitary bees and 21 species of bumblebees. Suitable nesting sites for these species can be created easily. For mining solitary bees, suitable nesting site is made by excavating a tunnel in a south or east-facing bank of bare earth. These are known as earth banks. Where earth banks exist and they are already being used by bees and other insects as nesting areas, these should be protected.

77 Creation of earth banks for mining solitary bees and other insects can take place where natural ridges / banks occur. This the best and most cost-effective way to create nesting habitat for solitary bees. Once established, they should be maintained by manual scraping back to bare soil on an annual basis. An area of 1m x 1m will suffice but the more you can provide the better. Solitary bees commonly only fly 100m from their nest to feed and therefore it is important to create nest sites close to food sources.

78 Bumblebees utilise earth banks, log piles (Section 6.1.1), and grasslands as habitats. The creation of earth banks and log piles is described above. To create nesting habitat in grassland, leave areas of undisturbed long grass as nesting sites. These may be an area of meadow or the base of a hedgerow that is left entirely uncut each year. This will allow flowering plants like clovers, vetches, and knapweed to provide additional food throughout the season and will ensure nesting bees are safe.

79 The nesting habitats should be identified as under protection from herbicide / pesticide sprays.

#### *6.1.1 Mammals*

80 Measures to support mammals are not proposed due to the potential for improvement to fauna species through habitat development. Surveys directly observed for found signs of mammal species including red deer, Irish hare, badgers, fox, and several bat species. The site already has significant area of suitable habitat for mammals with the forests surrounding the site, though the forest is currently immature, it will mature over the 21-year lifespan of the project. The creation of woodland, scrub, and hedgerow habitats will provide additional suitable habitat, food sources, and ecological corridors across the site for mammals.

81 Additionally, the installation of bat boxes is not recommended. Currently much of the existing woodland is immature and there is low potential of suitable trees which could support roosting bats. It is likely that trees will be able to support roosting bats as the retained woodland matures over the next 21 years.

### 6.2 General mitigation measures

#### *6.2.1 Habitats and Flora*

82 To control dust emissions during construction works, dust screens will be implemented along the 5m protective fence for linear habitats (i.e. Hedgerows (WL1), Treelines (WL2), Drainage ditches (FW4), Scrub (WS1), and from habitats within the non-constructable area (see Section 3), and 20m for Lowland/depositing rivers (FW2), where there is the potential for air quality impacts on sensitive ecological receptors during the Construction Phase. Standard mitigation measures are outlined in more detail in the CEMP (WSP, 2025).

83 Site specific mitigation measures will need to be implemented as a condition, if granted by Meath County Council, all of which will be incorporated into the final CEMP, for release of hydrocarbons, polluting chemicals, sediment/silt and contaminated waters control. The protection control measures for aquatic habitats are detailed in the EIAR and CEMP (Scott Cawley Ltd., 2025a; WSP, 2025) which will be adhered to by the construction contractor and delivered in the form of a Toolbox talk to all construction workers on site.

84 No Third Schedule invasive plant species were identified during surveys carried out within the Proposed Development. A pre-construction invasive species survey (Scott Cawley Ltd., 2025a; See also Section 6.1 of ISMP (Scott Cawley Ltd 2025b) shall be carried out prior to any construction activities (including enabling

works) by a suitably qualified specialist to confirm the presence or absence and extent of any invasive species within the Proposed Development site prior to the development. Data collected as part of this survey will also include the approximate area of any respective colonies ($m^2$) and a detailed description of the infestations (e.g. approximate total number of stems, pattern of growth and information on other vegetation present), if invasive species are identified.

85 It is legally required to eradicate Third Schedule invasive species prior to the onset of construction of any Proposed Development in close proximity. These documents include measures to aid the identification of relevant species, with details for the timing, methodology for physical and/or chemicals control, and for measures to avoid environmental damage during the use of herbicides.

86 Any vegetation (including trees, hedgerows or scrub adjacent to, or within, the Proposed Development boundary) which is to be retained shall be afforded adequate protection during the Construction Phase with regard to '*Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes*' (National Roads Authority, 2006) and BS 5837:2012: '*Trees in Relation to Design, Demolition and Construction: Recommendations*' (BSI, 2012), and as detailed protection measures outlined in the EIAR and CEMP (WSP, 2025).

### *6.2.2 Mammals*

Bats

87 With the exception of security lighting around construction compounds, no significant artificial lighting is being proposed to be installed during the Construction Phase. All construction works will take place within day light hours.

88 While no active roosts were identified during the surveys within the footprint of the Proposed Development, a number of trees will be removed during the Construction Phase of the Proposed Development. A pre-construction survey of all trees being removed, to rechecked for Potential Roost Features (PRFs) will be undertaken by an SQE engaged as part of the pre-construction surveys. The survey will confirm trees due for removal with PRFs. Where roosting bats are identified, a derogation licence will be sought from the NPWS.

Otter

89 Prior to construction works commencing, the appointed contractor will engage the services of the SQE to conduct a pre-construction otter survey of the Proposed Development. The survey will be undertaken within 10 months in advance of construction and supplemented by a further inspection of the Proposed Development immediately prior to site clearance to ensure that no holts have been established in the intervening period. Periodic site visits by the SQE (i.e. to be conducted under NRA guidance[14]) will include monitoring watercourses for signs of use by otter (i.e. checks for establishment of couches/holts) during construction works to determine any indication of use by otter.

90 Where any new holts/couches are recorded within 150m of the Proposed Development the appointed SQE will ensure that adequate mitigation is provided in accordance with '*Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes*' (NRA, 2006), as outlined in the EIAR, and a derogation licence is sought from the NPWS where necessary.

Badger

91 A pre-construction check for badger setts within the Proposed Development boundary will be carried out within 12 months of any construction work commencing. The usage of setts by badgers can change over time and a badger could potentially establish new setts in the future. Any new badger setts present will be afforded protection in line with the requirements set out in the NRA guidance document, as described in the EIAR (Scott Cawley Ltd., 2025a). This includes:

[14] NRA (2006). *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes*.

- Badger setts will be clearly marked and the extent of bounds prohibited for vehicles clearly marked by fencing and signage.
- No heavy machinery shall be used within 30m of badger setts. Lighter machinery (generally wheeled vehicles) shall not be used within 20m of a sett entrance. Light work, such as digging by hand or scrub clearance shall not take place within 10m of sett entrances.
- During the breeding season (December to June inclusive), none of the works shall be undertaken within 50m of active setts.
- Works can be undertaken within these zones following consultation with, the approval of and, if required, under the supervision of a SQE.

#### *6.2.3 Birds*

92 Vegetation (e.g. hedgerows, trees, scrub and grassland) will not be removed, between the 1st March and the 31st August, to avoid direct impacts on nesting birds. Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by the SQE for the presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within 3 days of the nest survey, otherwise repeat surveys will be required.

#### *6.2.4 Amphibians*

93 If works are to be undertaken in any habitat features suitable to support common frog or smooth newt (i.e. Drainage ditches (FW4)) that are to begin during the season where frogspawn, tadpoles, newt eggs or efts may be present (February – mid-summer), a pre-construction survey will be undertaken to determine whether breeding common frogs or smooth newt are present.

94 Any frog spawn, tadpoles, juvenile or adult frogs present will be captured and removed from affected habitat by hand net by a licensed individual and translocated to the nearest area of available suitable habitat. Where amphibians are confirmed, there will be a requirement for licence issued by NPWS in order to translocate them to suitable donor sites.

95 In the case of smooth newt, newt eggs, efts or adult newt individuals will be captured and removed from affected habitat by a licensed individual either by hand net or by trapping and translocated to the nearest area of available suitable habitat. If used, the type and design of traps shall be approved by the NPWS. This is a standard and proven method of catching and translocating smooth newt. Any capture and translocation works shall be undertaken immediately in advance of construction works commencing.

#### *6.2.5 Reptiles*

Where construction works will occur, sward height of Dry meadows and grassy verges (GS2) must be maintained a below 5cm in height in order to maintain the Proposed Development as sub-optimal / unsuitable for reptiles when works commence. Avoid vegetation clearance in sensitive areas in the winter hibernation period, rather undertaking vegetation clearance in the summer period when individuals will be mobile and able to disperse quickly.

## 7 Monitoring

96 A monitoring programme for areas of habitat enhancement and other biodiversity enhancement measures will be developed by the SQE. This monitoring programme will be implemented during the Construction Phase and will continue post-construction every five years[3] throughout the duration of the project's lifespan by the client and their appointed contractors to evaluate the success of biodiversity enhancement measures within the site, to implement maintenance measures if required/applicable and to address any potential issues that may arise.

97 The specified biodiversity enhancement measures under each management feature will be carried out by the landfill operator in conjunction with the SQE. All persons involved in the implementation and delivery of BNG and also landscape mitigation shall be competent, suitably trained and qualified as appropriate, as

identified within **Table 7** below. These persons are responsible for the delivery of BNG and briefing the relevant site personnel on the requirements to deliver BNG. A Construction Method Statement, specific to BNG and landscape mitigation, that also considers other relevant works that include for example temporary access, compounds etc, should be prepared for the BNG implementation process. Specific management strategies to ensure high biodiversity attainment for wildflower meadows and hedgerows are detailed in sections 5.1 and 5.2.

98 Monitoring of the effects of enhancement measures on habitats will be an important part of monitoring and will involve measuring changes against the baseline (see Section 3). The results of the post-construction monitoring site visits in year 1, 3, and 5 by the SQE will be reported to Meath County Council as part of planning conditions for the Proposed Development.

99 All of the above measures implemented by the Client/Operator will be monitored by the SQE every five years[3], throughout the duration of the project's lifespan by the client and their appointed contractors to ensure that they are working effectively, to implement maintenance measures if required/applicable and to address any potential issues that may arise. The results of the post-construction monitoring site visits in year 1, 3, and 5 by the SQE will be reported to Meath County Council as part of planning conditions for the Proposed Development.

***Table 7: Required competent persons to ensure that the BNG is both implemented and managed.***

| Responsibility | Competent Person |
|---|---|
| Monitoring of implementation and handover of landscape | Chartered Landscape Architect or Ecologist with relevant landscape knowledge. |
| Monitoring of implementation and handover of habitats | Ecologist with specific habitat experience and/or Chartered Landscape Architect with relevant ecological knowledge |
| Oversee the Implementation of the project | Project Manager with experience of overseeing the implementation of ecological habitats and landscape infrastructure for large scale developments |
| Contractor responsible for Implementation of landscape & ecology | Landscape contractor with relevant experience of habitat creation, habitat protection, or landscape implementation on a large scale |
| Oversee the Management and Monitoring of the project | Project Manager with experience of overseeing the implementation of ecological habitats and landscape infrastructure for large scale developments |
| Maintenance contractor for the Management of the Site | Landscape maintenance contractor with experience of managing habitats and large-scale landscape planting |
| Monitoring of habitats and landscape post implementation | Ecologist with specific habitat experience and/or Chartered Landscape Architect with relevant ecological knowledge |

## 8 Summary

100 This report sets out biodiversity enhancement measures for areas set-aside from the Proposed Development and measures to maintain and enhance habitats, including linear habitats (i.e. hedgerows, treeline, watercourses) and non-linear habitats (i.e. agricultural grassland and wet grassland). A detailed programme for the maintenance and monitoring all the biodiversity enhancement measures are described

within this Biodiversity Management Plan which will be undertaken by the appointed SQE and reported to Meath County Council to ensure the long-term conservation of biodiversity within the site and the surrounding environment.

# 9 References


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Meath County Development Plan 2021-2027 (2024) *Cultural and Natural Heritage Strategy*. Meath County Council.

NBDC (2023) All-Ireland Pollinator Plan, Guidelines 13. *Businesses: actions to help pollinators*. National Biodiversity Data Centre Series No. 31.

NRA (2006). *Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes*.

## Appendix I – Landscape Drawings

## Appendix II - Biodiversity-friendly Native Planting Lists

Some examples of native species that might be considered for habitat enhancement. The final specification will depend on supplier availability

| ***Riparian Areas*** |
|---|
| **Common name *Scientific name*** |
| Fool's watercress *Apium nodiflorum* |
| Marsh marigold *Caltha palustris* |
| Cuckoo flower *Cardamine pratensis* |
| Marsh willowherb *Epilobium palustre* |
| Yellow iris *Iris pseudacorus* |
| Purple loosestrife *Lythum salicaria* |
| Water forget-me not *Myosotis scorpiodes* |
| Common reed *Phragmites australis* |
| Common Club-rush *Schoenoplectus lacustris* |
| Celery-leaved buttercup *Ranunculus scleratus* |
| Creeping buttercup *Ranunculus repens* |
| Bulrush *Typha latifolia* |
| Meadowsweet *Filipendula ulmaria* |
| Wild angelica *Angelica sylvestris* |
| Redshank *Persicaria maculosa* |
| Water mint *Mentha aquatica* |
| Ragged robin *Silene flos-cuculi* |
| ***Wet Grassland meadow mix*** |
| **Common name *Scientific name*** |
| Meadow Sweet *Filipendula ulmaria* |
| Dandelion *Taraxacum officinale agg.* |
| Oxeye Daisy *Leucanthemum vulgare* |
| Ragged Robin *Silenes flos cuculi* |
| Ribwort Plantain *Plantago lanceolata* |

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| Self Heal *Prunella vulgaris* |
| White Clover *Trifolium repens* |
| Red Clover *Trifolium pratense* |
| Yellow Rattle *Rhinanthus minor* |
| Water Avens *Geum rivale* |
| Greater Stitchwort *Stellaria holostea* |
| Meadow Buttercup *Ranunculus acris* |
| Salad Burnet *Sanguisorba minor* |
| Slender Creeping Red Fescue *Festuca rubra rubra* |
| Crested Dogstail *Cynosurus cristatus* |
| Smooth Stalked Meadow Grass *Poa Pratensis* |
| Meadow Fescue *Festuca pratensis* |
| Creeping Bent *Agrostis stolonifera* |
| Yorkshire Fog *Holcus lanatus* |
| Browntop Bent *Agrostis capillaris* |
| Timothy (Small eared) *Phleum bertolonii* |
| ***Species rich meadow grassland*** |
| **Common name *Scientific name*** |
| Dandelion *Taraxacum officinale agg.* |
| Oxeye Daisy *Leucanthemum vulgare* |
| Ribwort Plantain *Plantago lanceolata* |
| Self Heal *Prunella vulgaris* |
| Meadow Vetchling *Lathyrus pratensis* |
| Agrimony *Agrimonia eupatorium* |
| Birdsfoot Trefoil *Lotus corniculatus* |
| Lady's Bedstraw *Galium verum* |
| White Clover *Trifolium repens* |
| Red Clover *Trifolium pratense* |
| Yellow Rattle *Rhinanthus minor* |
| Meadow Buttercup *Ranunculus acris* |
| Salad Burnet *Sanguisorba minor* |

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|---|
| Slender Creeping Red Fescue *Festuca rubra rubra* |
| Crested Dogstail *Cynosurus cristatus* |
| Smooth Stalked Meadow Grass *Poa Pratensis* |
| Meadow Fescue *Festuca pratensis* |
| Creeping Bent *Agrostis stolonifera* |
| Yorkshire Fog *Holcus lanatus* |
| Browntop Bent *Agrostis capillaris* |
| Timothy (Small eared) *Phleum bertolonii* |
| Tall Oat-grass *Arrhenatherum elatius* |
| Quaking Grass *Briza media* |