

PWLLFAWATKIN LANDFILL : LANDSCAPE AND ECOLOGY MANAGEMENT PLAN (LEMP)

PWLLFAWATKIN | PONTADAWE | NEATH



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WRITTEN & PREPARED BY

Richard Brook | Senior Landscape Architect

REVIEWED & APPROVED BY

Alex Stappard | Principal Landscape Architect

AUTHORISED BY

Sirius Planning

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1. INTRODUCTION

1.1 INTRODUCTION

- 1.1.1 The following Landscape and Ecological Management Plan (LEMP) has been prepared by Sirius Planning on behalf of FCC Environment Ltd in support of a planning application P2021/1277 and in order to discharge Condition 10 and Condition 15 of the decision notice, received on 2nd February 2022.

Condition 10 states:

"Within 6 months of the date of this permission, or prior to the commencement of any restoration planting works, whichever is the sooner, an Ecological Management and Monitoring Plan will be submitted to and agreed with NPTCBC. This will include:

a) details of the creation of the new habitats to include a species rich grassland; a revised plant schedule to reflect the long term aim of a biodiverse rich site; details of maintenance and contingency for failures.

b) details of the long term management.

c) a monitoring schedule.

d) a mechanism for the monitoring to feed into future actions.

Reason

To comply with the proposals set out in the Ecological Appraisal section 6 and to

ensure compliance with the Environment Wales Act 2016 and to accord with Policies

W2, EN6 and EN7 of the Local Development Plan"

Condition 15 states:

"Within 6 months of the date of this permission, or prior to the completion of the final restoration levels, as shown on WR7816/12/04 Pre-Settlement Waste Contours 1:2,500, whichever is the sooner, the applicant shall submit a detailed restoration and aftercare scheme for phases 3 - 4 (inclusive of the sidewall extension detailed in this application) and any areas requiring restoration and aftercare works not included within previous planning approvals. Works shall be carried out in accordance with the approved scheme, the scheme shall include, inter alia;

1. Restoration

a) the removal of any buildings, plant and machinery and the reinstatement of the site and access roads by clearing plant, buildings, machinery, road base, concrete or brickwork.

b) details of resspreading of overburden, subsoil and topsoil previously stripped from the site, specifying depth and placement.

c) the ripping of any compacted layers of final cover to ensure adequate drainage and aeration.

d) the machines to be used in soil resspreading operations.

e) the final levels of the reclaimed land and the gradient of the slopes which shall be graded to prevent ponding or erosion of surface water.

f) the drainage of the reclaimed land including the formation of suitably graded contours to promote natural drainage and the installation of artificial drainage where necessary, and the position of main outflow ditches and watercourses.

g) the position and erection of fencing, hedge on bank constructions and gates as necessary.

h) the creation of any ponds or water features.

i) The final contours proposed under the above scheme shall not exceed the post settlement contours as indicated on Approved Drawing No. WR7816/12/05 Post- Settlement Waste Contours 1:2,500 Aftercare

The aftercare scheme shall set out in detail the requirements as may be necessary to bring the land to the required standard for the use for amenity i.e. when it is reasonably fit for those uses, and the scheme shall include, inter alia, details of the following.

a) the timing and pattern of vegetation establishment including species to be planted, grass seeding mixture, stock type and size, spacing, method and position of planting.

b) cultivation practices for the preparation of the soils, subsoils, colliery shale etc. secondary treatments such as moling, subsoiling, discing, stone picking as necessary. drainage including timing of installation work, maintenance works or temporary drainage measures.

c) fertilizer and weed control to improve soil fertility and control of weed to be based on soil/shale sampling and analysis.

d) a detailed Annual Programme for the first and subsequent years for the Aftercare of the site which shall include, inter-alia, the following information:

i. Identify the person(s) responsible for the succeeding year's programme.

ii. Vegetation establishment and layout.

iii. Secondary treatments such as further moling, subsoiling or fertilizing requirements.

iv. Field drainage requirements and maintenance.

e) Tree and hedge establishment for the years including maintenance such as beating up, weed control, fertilizer application, cutting or pruning.

The scheme shall be implemented as approved.

Reason

In the interest of the satisfactory phasing of restoration and aftercare and to accord with Policies W2 and EN8 of the Local Development Plan"

- 1.1.2 This LEMP is a site-specific document for the area included within the redline which comprises phases 3 and 4 of the landfill as part of applying for an extension of time and revised restoration profile. This report has been prepared in order to provide a proposed structure and scope for the ongoing and long-term commitments to manage existing and proposed landscape and ecological habitats with the aim of protecting and enhancing site wide biodiversity as well as improving landscape structure and amenity value.

1.2 THE SITE

- 1.2.1 Three former coal spoil tips form the majority of FCC Environmental's (FCC) landholding at

Pwllfawatkin. Two of these tips, Tip 891 and Tip 890, are located to the north of Baran Road. The third tip, Tip 871 is located to the south of Baran Road.

- 1.2.2 This LEMP has been prepared to support the planning approval and discharge of conditions 10 and 15 for the restoration of Tip 890 including continuation of waste importation to 31st October 2023 with restoration to be completed by 31st October 2025.
- 1.2.3 Reference should also be made to the previously submitted and approved documents as part of the planning application (Planning Ref: P2021/1277 and Sirius Planning Ref: WR7816) including the Planning and Environmental Statement and Landscape and Visual impact Assessment for phases 3 and 4 of the landfill site, for further details on the proposed development and the planning history of the site.

1.3 RESPONSIBILITIES

- 1.3.1 The appointed landscape contractor shall be responsible for the implementation of the restoration planting works and their subsequent establishment and maintenance in accordance with the submitted drawings, details and planting specifications as well as management prescriptions as detailed in section 4 of this LEMP report. Any required funding should be secured prior to the commencement of any construction works at the site. Where the results from monitoring show that the conservation aims and objectives of the LEMP are not being met) the appointed contractor, with the agreement of the client (FCC Environment) must also set out how contingencies and/or remedial action will be identified, agreed and implemented so that the development still delivers the fully functioning biodiversity objectives of the proposed scheme.
- 1.3.2 A competent project Ecologist shall be appointed to provide a programme to monitor the implementation of the proposed habitats and any management requirements on existing restoration habitats. This will include site visits and meetings with the appointed landscape management contractor at agreed intervals to ensure landscape works are carried out in accordance with the landscape specification and schedules. Monitoring will also assess whether any changes are needed to the specified management regime.
- 1.3.3 A competent project Arboriculturist shall be appointed to provide visual inspection of the tree planting on an annual basis to check for good strong foliage and growth. They would provide recommendations as to any measures required to ensure the successful establishment and maintenance of the planting such as thinning, selective removals or formative pruning works.
- 1.3.4 As part of initial monitoring any failures of planting or seeding during the 'Plan' period (5 Year LEMP) will be rectified by the appointed landscape management contractor during the next suitable planting season.

1.4 LEGISLATION AND POLICY

- 1.4.1 All relevant EU and UK nature conservation law will be adhered to in relation to the protection of ecological features and ecological enhancement/management. This includes (although not relevant to this site) the protection afforded to great crested newts (GCN) under the Conservation of Habitats and Species Regulations 2017 (as amended), and the protection afforded to reptiles and nesting birds under the Wildlife and Countryside Act 1981 (as amended).
- 1.4.2 The LEMP and its subsequent landscape and ecological management prescriptions will aim to ensure compliance with Environment Wales Act 2016 and Policies W2, EN6 and EN7 of the Local Development Plan.
- 1.4.3 The presence of Habitats of Principal Importance, Local Biodiversity Action Plan habitats, and non-statutory designated Local Wildlife Sites (LWS) should also be considered (including

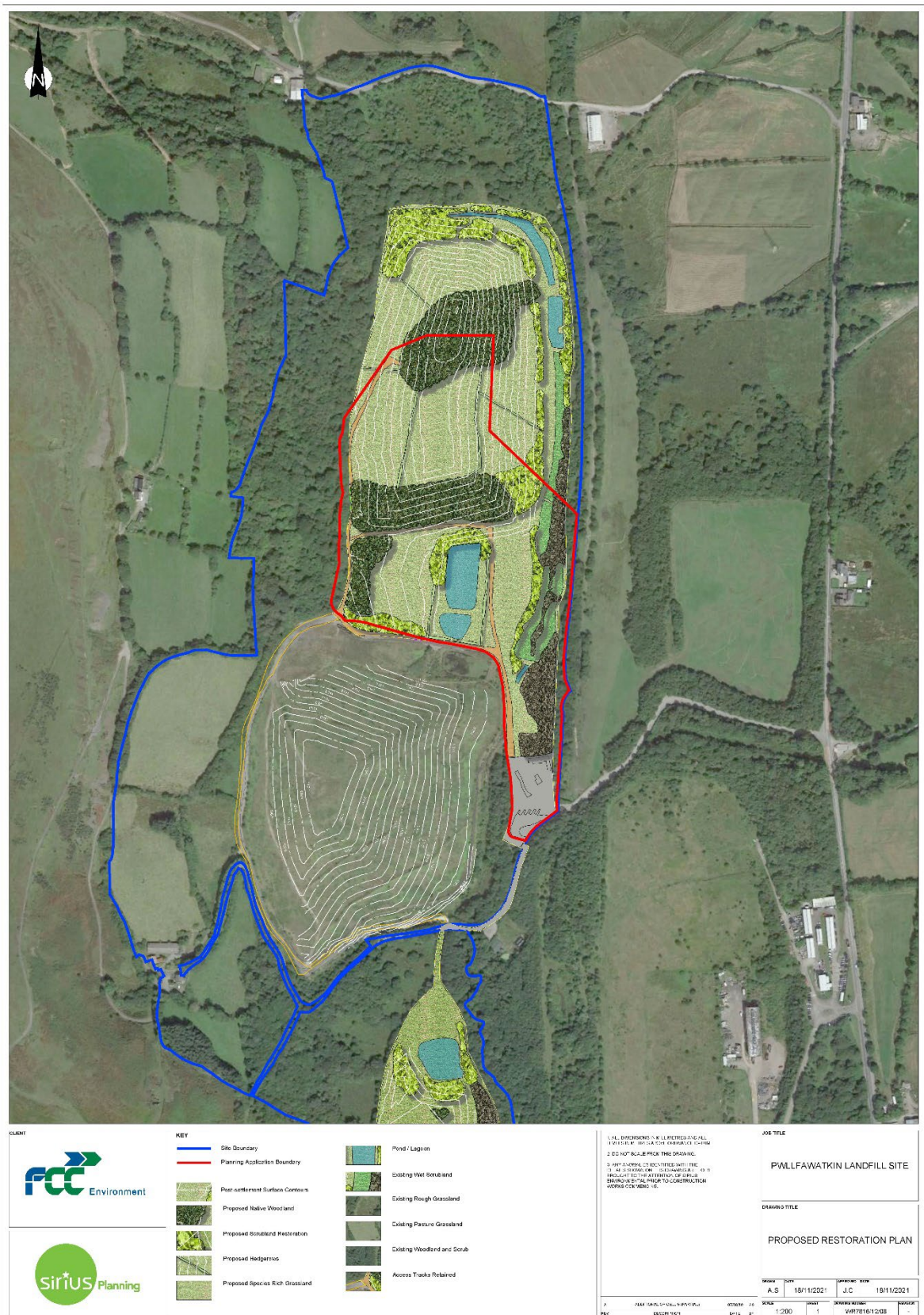
hedgerows and adjacent woodland).

1.5 THE PROPOSED DEVELOPMENT

- 1.5.1 FCC are seeking to revise the restoration profile of Tip 890 to facilitate closure of the tipping operation in a safe and environmentally responsible manner. In comparison to the previously consented scheme, this will result in:
- Revised restoration contours (covering a reduced area than previously consented) to complete the restoration of Tip 890 by constructing a sidewall extension to the operational cell 4 and not developing the previously consented cell 5;
 - Localised re-profiling of cells 3 and 4;
 - A reduction in void space from that previously consented;
 - An amended scheme of surface water management to account for the revised restoration profile;
 - Amended phasing scheme; and
 - Amended scheme of restoration (landscaping)
- 1.5.2 The proposed restoration scheme for phases 3 and 4 of the landfill site is shown on the approved Restoration Plan (Drawing WR7816 12 08) submitted with the planning application (Ref:P2021/1277) and included at Figure 1 below.
- 1.5.3 As part of fulfilling Conditions 10 and 15 of the Planning Application planting plans, planting details and planting specifications have been prepared which illustrate the woodland, hedgerow and shrub/scrub planting as well as meadow grass seeding operations for the implementation of the approved Restoration Scheme for phases 3 and 4 of the landfill submitted in November 2021. **Refer to Drawings WR7816 12 09 Sheets 1-3 and WR7816-Planting Specifications-2023-11-13.**

Figure 1:Proposed Restoration Plan

Phases 3 and 4 of Pwllfawatkin Landfill (Drawing Ref: WR7816 12 08)



2. DESIGN AND MANAGEMENT OBJECTIVES

2.1 KEY OBJECTIVE

- 2.1.1 The principal design objective is to provide restoration treatments in order to fulfil the consented restoration scheme, ensuring ongoing and long-term commitments to manage existing and proposed landscape and ecological habitats are upheld, with the aim of protecting and enhancing site wide biodiversity as well as improving landscape structure and amenity value.
- 2.1.2 The principal conservation objective for this document is to enhance the nature conservation value of the retained and newly created habitats in the long term.
- 2.1.3 To ensure these objectives are achieved, monitoring will form an integral part of the LEMP process and reporting subject to the discharging of planning conditions by the Council.

2.2 OVERALL AIMS

- 2.2.1 The long term aspiration has and will continue to be restoring the landfill site to be in keeping with the adjacent local landscape character. The planting and seeding mixes used in already restored parts of the site were selected to replicate the types and species found in the surrounding area.
- 2.2.2 The landscape and ecological design/ management aims are as follows:
- To safeguard and enhance the biological and physical integrity of retained habitats onsite;
 - To provide high quality habitats on the site with visual and nature conservation value;
 - To provide habitats of value to a range of faunal species/groups, maintaining and enhancing populations of protected/notable species identified within the site and in the local area;
 - To comply with legal obligations and constraints.

2.3 MANAGEMENT AND MAINTENANCE OBJECTIVES

- 2.3.1 The establishment and future success of the soft landscape works is largely dependent upon the quality of the initial planting works, and the standards and frequency of the subsequent management and maintenance it receives.

Key objectives include:

- Ensure the landscape develops in a manner commensurate of the design intentions,
- To secure a long-term future for existing trees and hedgerows that provide amenity and ecological value,
- Deliver and maintain a functional, safe environment for all site users,
- Establishment and continued growth to maturity of the trees and other planting proposals,
- Define planned maintenance operations to ensure the health and survival of plants during the Plan Period,
- To manage the landscape in a manner that ensures the safety of site users, such as maintaining natural surveillance through the site, and
- Ensuring ongoing landscape management and maintenance regimes throughout the

lifetime of the development.

2.4 SOFT LANDSCAPE MANAGEMENT REGIMES

2.4.1 The key principles for the Soft Landscape Management Regimes are;

- Apply good practice to all horticultural operations,
- Promote healthy growth and establishment of all plants, shrubs and trees, Ensure control of invasive weeds,
- Ensure the development of prime plant, shrub and tree form, shape, density and display,
- Provide protection against pests and diseases,
- Promote amenity and wildlife value, and
- Replacement of plants and shrubs in line with the design proposals during the rectification period

3. MANAGEMENT PRESCRIPTIONS

3.1 INTRODUCTION

- 3.1.1 The current ecological baseline was established following a site-wide Phase 1 habitat survey in August 2021 by Avian Ecology Consultants, in addition to using desk study information from Mason's landfill and the surrounding area. This information has been used to inform the future baseline, as well as to inform revised landscape proposals.
- 3.1.2 All existing habitats and restored habitat areas will be fully retained within the wider landfill site and will be protected throughout for phases 3 and 4 of the restoration works.
- 3.1.3 The approved Restoration Plan (Refer to previously submitted Drawing WR7818 12 08) and LEMP will create a matrix of new and existing habitats and corridors through the site to encourage the establishment and movement of wildlife.
- 3.1.4 The following section outlines the aims and objectives of the habitat creation. Detailed planting specifications and prescriptions to implement the restoration scheme are contained with the Planting Plans and Planting Specifications to be submitted with the LEMP Report. Further details and management options/regimes are set out at Section 4 in order to provide strategic context for how these can be achieved.
- 3.1.5 Reference should be made to NBS Planting Specifications Document WR7816: Planting Specifications for the full details of planting, seeding and protection fencing requirements and Drawings WR7816 12 09 Sheets 1-3 for the layout of planting, planting details and specification schedules.

3.2 GENERAL STANDARDS FOR LANDSCAPE AND ECOLOGICAL SPECIFICATION

- 3.2.1 All works need to be carried out in accordance with the correct Health and Safety Legislation, British Standard and Horticultural Practices.
- 3.2.2 The appointed Landscape Contractor will provide Method Statements that will include health and safety arrangements, details of the intended frequency and timing of operations and details of the type of machinery to be used.
- 3.2.3 The following prescriptions are to be followed by the appointed contractor. These are to reviewed at the end of the Plan period

- 3.2.4 Tree, Shrub and hedgerow planting are to be delivered and planted in accordance with to CPSE 'Handling and establishing landscape plants'. Refer to Drawings SRE1130 09 01 Sheets 1-7. All plants should be stored only, when necessary, in accordance with the above CPSE guidance.
- 3.2.5 Planting is to remain materially undamaged, sturdy, healthy and vigorous, planted upright or well balanced with best side to front. Trees and shrubs are to be of good shape and without elongated shoots, grown in a suitable environment and hardened off before being delivered to the site. All planting is to be true to name, of UK provenance and free from pests, diseases, discoloration, weeds, fungus and physiological disorders. No substitutes in size or species shall be made without the written consent of the Landscape Architect and the LPA.
- 3.2.6 All works are to be undertaken with due diligence, being sure to leave the works in a clean and tidy condition at completion and after any maintenance operations. Protect areas affected by planting operations using boards/ tarpaulins and do not place excavated or imported material directly on adjacent grassed areas.
- 3.2.7 Bare root deciduous planting shall be carried out in autumn only, from late October onwards and no later than the end of January; conifers and evergreens planted either in September/October or April/May. Container grown plants can be planted at any time of year if ground and weather conditions are favourable. Bare root deciduous planting to be carried out only during suitable ground and weather conditions. Planting shall not be carried out in waterlogged or frozen ground.
- 3.2.8 Measures specific to the protection and management of wildlife species found on the wider site will be provided in the Biodiversity Management Plan to be submitted separately to this LMP in order to discharge Condition 5 of the Approval Notice with reference to the Phase 1 Habitat Survey. This may include ongoing and proposed maintenance practices and protection measures during the enabling and construction phases to ensure existing habitats are protected and details for the design and implementation of any new proposed habitats created to enhance the biodiversity value of the site.

4. LANDSCAPE AND ECOLOGICAL MANAGEMENT

4.1 GENERAL MANAGEMENT PRINCIPLES

- 4.1.1 In general it is common practice for maintenance regimes to be for a period of 5 years after which members of staff involved in site management would review these before commencing further maintenance works.
- 4.1.2 Maintenance shall include weeding (docks/brambles/thistles etc), pruning (as required), firming in after frost/human damage/high winds etc, control of pests and diseases, adjusting/ repairing tree ties/ shelters as required and litter and debris removal.
- 4.1.3 Any plant losses that fail or die over a five-year aftercare period following practical completion are to be replaced with the same or similar species (to approval) within the next suitable planting season (mid Oct – end of January). Management and maintenance operations will continue after this time to be reviewed at annual aftercare meetings on site with client and competent ecologist and arboriculturist.

4.2 EXISTING AND PROPOSED HABITATS

- 4.2.1 The area containing the restoration treatments within phases 3 and 4 of the landfill site is proposed to be comprised of meadow grassland with fields subdivided by new species rich hedgerows. This is to be surrounded by areas of native woodland, shrub and scrub planting (NVC 16) implemented as part of the landfill restoration, within the ownership boundary, which will be required to be protected during the restoration of phases 3 and 4 and subsequent

phases following on from this. Existing and proposed habitats will be maintained as part of the long term management commitments for the site.

- 4.2.2 Drawing WR7816 12 09 Sheets 1-3 to be submitted to the Council with this LEMP report illustrate the woodland, hedgerow, shrub/scrub planting and meadow grass seeding operations to be implemented in order to fulfil the consented restoration scheme for phases 3 and 4 of the landfill site and the discharge Conditions 10 and 15 of the planning approval (Ref: P2021/1277).
- 4.2.3 This will further complement existing established woodland and scrub planting within the wider landfill site to include the following landscape and ecological habitat enhancements :
- Increased variation and distribution of native woodland and woodland scrub, increasing the diversity of habitats over the site.
 - An enhanced network of native hedgerows within the site creating new field structure and improved green corridors. Species-rich hedgerows containing five or more native species will be planted, significantly improving the benefit to wildlife than a single-species hedgerow. The subsequent increase in woodland and shrub/scrub planting will support improved biodiversity on site. Native species will also be selected with focus on native fruiting and flowering species. The hedgerows and woodland areas have potential to provide increased nesting, roosting and foraging opportunities for birds and bats (once sufficient maturity has been reached). The increased source of nectar for pollinators will also attract invertebrate prey for foraging birds and bats.
 - Retention (and protection of) all existing restoration woodland and scrub habitat.

4.3 PROPOSED MEADOW GRASSLAND

- 4.3.1 The final restored landform will be sown with a meadow grass mixture within the proposed field structure as laid out in the planting plan to be submitted with this LEMP report in order to establish a diverse grass and wildflower sward across phases 3 and 4 of the site. Initially this can be left to grow longer up to 125mm and subject to 2 annual cuts in order to provide additional cover and wildlife habitat adjacent to hedgerow corridors.
- 4.3.2 The Special General Purpose Meadow Mix (Table 1) will be sown at 4 grams per m² (40kg/ha) as per the general manufacturer's recommendation ¹to allow space for each species to establish and to produce good ground cover.

Table 1: Emorsgate EM3 Special General Purpose Meadow Mixture
(or similar approved) Species Composition

Mix %	Species	Common Name
Wild Flowers 20%		
0.40%	Anthyllis vulneraria	Kidney Vetch
1.40%	Centaurea nigra	Common Knapweed
0.60%	Centaurea scabiosa	Greater Knapweed
0.20%	Chaerophyllum temulum	Rough Chervil
0.60%	Cruciata laevipes	Crosswort
1.00%	Daucus carota	Wild Carrot
0.10%	Echium vulgare	Viper's-bugloss
0.10%	Filipendula ulmaria	Meadowsweet
1.00%	Galium album	Hedge Bedstraw

¹ [EM3 Special General Purpose Meadow Mixture - Emorsgate Seeds \(wildseed.co.uk\)](https://www.wildseed.co.uk/em3-special-general-purpose-meadow-mixture)

0.80%	Galium verum	Lady's Bedstraw
0.20%	Geranium pratense	Meadow Crane's-bill
0.80%	Knautia arvensis	Field Scabious
0.20%	Lathyrus pratensis	Meadow Vetchling
1.00%	Leucanthemum vulgare	Oxeye Daisy
2.40%	Malva moschata	Musk Mallow
0.10%	Medicago lupulina	Black Medick
0.40%	Origanum vulgare	Wild Marjoram
2.20%	Plantago lanceolata	Ribwort Plantain
0.80%	Plantago media	Hoary Plantain
2.00%	Poterium sanguisorba ssp sanguisorba	Salad Burnet
0.40%	Primula veris	Cowslip
1.40%	Rhinanthus minor	Yellow Rattle
0.20%	Sanguisorba officinalis	Great Burnet
1.00%	Silene dioica	Red Campion
0.20%	Silene vulgaris	Bladder Campion
0.30%	Vicia cracca	Tufted Vetch
0.20%	Vicia sativa ssp. Segetalis	Common Vetch
80% Grasses		
8.00%	Agrostis capillaris	Common Bent
28.00%	Cynosurus cristatus	Crested Dogstail
24.00%	Festuca rubra	Red Fescue
4.00%	Phleum bertolonii	Smaller Cat's-tail
0.00%	Poa pratensis	Smooth-stalked Meadow-grass

- 4.3.3 Areas to be sown will be removed of weeds using repeated cultivation. Then plough or dig to bury the surface vegetation, harrow or rake to produce a medium tilth, and roll, or tread, to produce a firm surface. Removal and clearance of large stones and earth clods larger than 25mm in any dimension.
- 4.3.4 Seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture. The seed must be surface sown and can be applied by machine or broadcast by hand. To get an even distribution and avoid running out divide the seed into two or more parts and sow in overlapping sections. Do not incorporate or cover the seed, but firm in with a roll, or by treading, to give good soil/seed contact.
- 4.3.5 In the first year the sown meadow species are perennial are slow to establish. The first flush of annual weeds, arising from the soil seed bank may look unsightly, but they will offer shelter to the sown seedlings and will die before the year is out. Therefore the cutting the annual weeds should be left until mid to late summer. Then cut, remove and compost in August. This will reveal the young meadow, which can then be kept short by grazing or mowing through to the end of March of the following year. Dig out any residual perennial weeds such as docks.
- 4.3.6 In the second and subsequent years sowings are best managed by traditional meadow management based around a main summer hay cut in combination with autumn and possibly spring mowing or grazing.
- 4.3.7 Meadow grassland is not cut or grazed from spring through to late July/August to give the sown species an opportunity to flower. After flowering in July or August take a 'hay cut': cut

back with a scythe, petrol trimmer or tractor mower to c 50mm. Leave the 'hay' to dry and shed seed for 1-7 days then remove from site or compost within the site area .

- 4.3.8 Mow or graze the re-growth through to late autumn/winter to c 50mm and again in spring if needed.

4.4 NATIVE WOODLAND (NVC 16)

- 4.4.1 Native woodland will be planted to provide an enhanced landscape structure and to increase the nature conservation and biodiversity value of the wider landfill site. The planting mix will be comprised of 75% transplants and 25% feathered trees in order to provide a transitional native woodland habitat in line with NVC 16. Planting is to laid out as per the planting plans and planting schedules on Drawing WR7816 Sheets 1- 3. The detailed specification for the implementation of woodland planting is provided within the NBS Planting Specification document Ref: WR7816 Planting Specifications and for ease of reference the species composition is also within Table 2 below.
- 4.4.2 The planting is to be subject to an ongoing management scheme which will be reviewed every 5 years for the full duration of the aftercare period.
- 4.4.3 Immediately after planting plants should be watered thoroughly with 20L of water per m2, and without damaging or displacing plants or soil. Lightly firm soil around plants and fork and/ or rake soil, without damaging roots, to a fine tilth with gentle cambers and no hollows.
- 4.4.4 All transplants, shrubs and feathered trees are to be kept weed free to the end of the defects liability period by the use glyphosate spray.
- 4.4.5 The woodland planting listed in the table below is designed to allow the formation of transitional woodland communities and is based on National Vegetation Classification (NVC) W16.

Table 2: Native Woodland (NVC16) Canopy Mix
planted @2m centres

Mix %	Species	Common Name
Woodland transplants		
10	<i>Betula pendula</i>	Silver Birch
10	<i>Betula pubescens</i>	Downy Birch
20	<i>Quercus robur</i>	Common English Oak
10	<i>Quercus petraea</i>	Sessile Oak
10	<i>Sorbus aria</i>	Whitebeam
5	<i>Salix caprea</i>	Goat Willow
5	<i>Ulex europaeus</i>	Gorse
5	<i>Ilex aquifolium</i>	Holly
Feathered Trees planted @ 4.5 centres within the mix		
5	<i>Alnus glutinosa</i>	Alder
5	<i>Betula pendula</i>	Silver Birch
5	<i>Crataegus monogyna</i>	Hawthorn
5	<i>Corylus avellana</i>	Hazel
5	<i>Sorbus aucuparia</i>	Rowan

4.5 HEDGEROW PLANTING

- 4.5.1 Hedgerows are identified as a Habitat of Principal Importance (HPI) as listed under Section 7

of the Environment Wales Act 2016

- 4.5.2 Hedgerow planting will include the creation of new hedgerows as illustrated on Drawings WR7816 12 09 to be submitted with this LEMP report. Bare root hedgerow planting is to be undertaken during the planting season (October to March inclusive) . Refer to Table 3 below for species composition.
- 4.5.3 Proposed planting areas are to have existing grass and vegetation sprayed off or cut to a height of c.75mm or less, no longer than 1 week prior to planting.
- 4.5.4 Hedgerow plants (Table 3) are to be planted at 6 plants per linear metre in a double staggered row in groups of approximately 5-9 as per the planting schedule on WR7816 12 09 Sheet 3. Planting trenches should be large enough to take the full spread of the roots with plants set out evenly as shown in the specification drawing.
- 4.5.5 Immediately after planting plants should be watered thoroughly with 20L of water per m², and without damaging or displacing plants or soil. Lightly firm soil around plants and fork and/ or rake soil, without damaging roots, to a fine tilth with gentle cambers and no hollows.
- 4.5.6 All shrubs are to be kept weed free to the end of the defects liability period by the use of glyphosate spray.
- 4.5.7 Individual biodegradable spiral guards and bamboo canes will be required to prevent damage to saplings by browsing rabbits.

Table 3: Native Species Rich Hedge Mix planted @ 6/m in a double staggered row

Mix %	Species	Common Name
40	<i>Crataegus monogyna</i>	Hawthorn
20	<i>Corylus avellana</i>	Hazel
15	<i>Cornus sanguinea</i>	Dogwood
5	<i>Ilex aquifolium</i>	Holly
5	<i>Prunus spinosa</i>	Blackthorn
5	<i>Rosa canina</i>	Dog Rose
10	<i>Viburnum opulus</i>	Guelder Rose

4.6 NATIVE SHRUB/SCRUB PLANTING

- 4.6.1 A native low shrub/scrub mix is to be planted at the edges of the restored landform and around restoration waterbodies within phases 3 and 4 of the landfill site. This is in order to provide further enclosure of the proposed landform from the immediate wider landscape as well as to provide an enhanced landscape structure for the wider landfill site complementing the proposed field layout and providing transitional habitat to both surrounding and proposed restoration woodland planting areas. The proposed shrub/scrub planting will enhance the overall nature conservation value of the wider landfill site. The additional proposed planting will increase the available species diversity which will result in an increase to the wildlife and biodiversity value of landscape and ecological habitats at the site.
- 4.6.2 The areas to be planted shall be first be sprayed with a suitable herbicide for suppressing perennial weeds prior to any planting operations with an appropriate period of die back allowed for (typically a minimum of 2 week)s and any existing vegetation not forming viable native shrub species cut back as appropriate to allow for the establishment of new shrub/scrub planting.
- 4.6.3 Scrub planting (Table 4) is to be planted at 1 plant per m² in groups of approximately 5-9 as

per the planting schedule on Drawing WR7816 12 09 Sheet 3. Planting pits should be large enough to take the full spread of the roots with plants set out evenly as shown in the specification drawing.

- 4.6.4 Plants are to be planted in shelters and secured with canes as per the detail on Drawing WR7816 12 09 Sheet 3.
- 4.6.5 Immediately after planting plants should be watered thoroughly with 20L of water per m², and without damaging or displacing plants or soil. Lightly firm soil around plants and fork and/ or rake soil, without damaging roots, to a fine tilth with gentle cambers and no hollows.
- 4.6.6 All shrubs planted into new/ existing grass are to have a 1m diameter biodegradable weed proof membrane around the trunk covered with 50mm bark mulch or be sprayed to keep grass competition down. All scrub planting is to be kept weed free during the first two growing seasons.

Table 4: Native Low Shrub/Scrub Mix planted @1 per m²

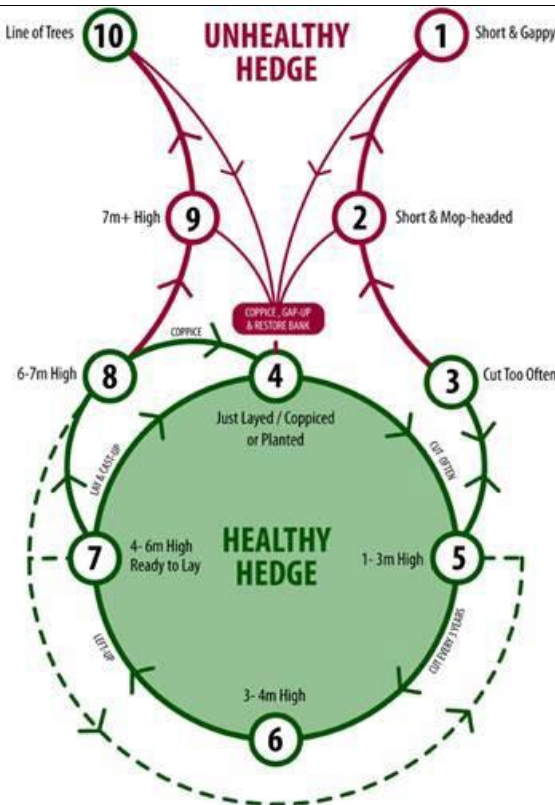
Mix %	Species	Common Name
10	<i>Acer campestre</i>	Field Maple
25	<i>Crataegus monogyna</i>	Hawthorn
10	<i>Corylus avellana</i>	Hazel
5	<i>Ilex aquifolium</i>	Holly
10	<i>Prunus avium</i>	Wild Cherry
10	<i>Prunus spinosa</i>	Blackthorn
10	<i>Rosa canina</i>	Dog Rose
10	<i>Sorbus aucuparia</i>	Rowan
10	<i>Viburnum opulus</i>	Guelder Rose

4.7 LANDSCAPE MANAGEMENT WORKS

- 4.7.1 The following section outlines the works programme and management regime for retained and newly created habitats present on site.
- 4.7.2 Maintenance shall include weeding (docks/ brambles/ thistles etc), pruning (as required), firming in after frost/human damage/high winds etc, control of pests and diseases, adjusting/ repairing tree ties/ shelters as required and litter and debris removal.
- 4.7.3 All plants must also receive adequate watering to ensure their health and survival.
- 4.7.4 Any plant losses that fail or die over a five-year period following practical completion are to be replaced with the same or similar species (to approval) within the next suitable growing season (mid Oct – mid March).

Table 5: Five Year Management Works Programme

Prescriptions	Years with Priority				
	1	2	3	4	5
Existing Woodland and Scrub Areas					
Woodland and scrub management works will follow best practice procedures as set out in BS 3998:2010. No removal of woody vegetation will take place during the bird nesting season unless checked by a qualified Ecologist. Existing retained trees will be left unmanaged unless otherwise dictated for reasons of public safety.	✓				

Retained trees will be protected from damage and from soil compaction during construction where construction works are to be undertaken in the vicinity, in accordance with guidance in British Standard 5837:2012 – Trees in Relation to Design, Demolition and Construction – Recommendations.	✓				
Proposed Woodland Areas (Refer to Section 4.4)					
Establishing young trees will be monitored and dead or dying species only will be thinned or removed.					✓
Proposed Hedgerows (Refer to Section 4.5)					
Keep a check on pernicious/rank weed growth, docs, thistles, brambles etc. and aim to keep new planting free of such weeds. Allow new planting to grow for the first 5 years with minimal intervention for cutting, except for cutting back lead shoots once they reach a height of 1m to encourage dense growth and side branching	✓	✓	✓	✓	
In the long term, hedgerows will be taken through a Hedgerow Management Cycle (HMC) ² . The ten steps of the HMC are shown below. The cycle shows a healthy green core and two unhealthy red offshoots. The aim should be to keep the hedge in the green part (steps 3 to 8), periodically laying or coppicing it, with trimming at appropriate intervals in between. If the hedgerow is not permitted to go through this cycle, it will either, if cut too often, become short and gappy (steps 1 – 3) or, if neglected, develop into a line of trees (steps 8 – 10). In general existing and proposed hedgerows are to grown/established to 3m tall to assist with screening of the arrays from the immediate surroundings.	As required				
	As required				
Meadow Grassland (EM3 Refer to Section 4.4)					

² The Hedge Management Cycle (HMC). Artwork by Will Field. Management Cycle concept developed by Nigel Adams. Hedgelink UK.

Following establishment, grassland will be allowed to flower and set seed between spring and July/August. A cut will be taken after flowering, with material left for up to seven days to allow seeds to set. Regrowth will be mown to c50mm through to late autumn/winter and again in spring if necessary. Alternatively, the grassland will be subject to grazing between July-March, with the livestock then removed to allow species to flower and set seed.	✓	✓	✓	✓	✓
Spot treat persistent pernicious weeds using herbicide following the first season's growth and/or manual hand strimming of target areas either in late summer when adjacent grassland is mown or in early spring. Care will be taken when using herbicide adjacent to riparian and aquatic habitats to prevent pollution of such habitats.	As required				
Fences and Gates					
Fencing and gates shall have a twice annual inspection in spring and autumn.	✓	✓	✓	✓	✓
Access Roads/Paths					
Ensure access paths are free from weeds, trip hazards or other obstructions. This includes a once annual spray of weeds and any depressions / pits to be filled.	✓	✓	✓	✓	✓
Tree and shrub Protection					
Removal of tree guards at the end of the first 5 year aftercare period or earlier if found split/damaged.					✓

4.8 LONG TERM MAINTENANCE

- 4.8.1 Beyond the 5-year initial planting maintenance period the following maintenance operations are to be carried out:

Years 5 to 10:

- 4.8.2 Low scrub/Shrubs: Aim to thin out approximately 10% of shrub groups ensuring that single species groups lose some of their number but ensuring some of the group survive.

Years 10 to 25

- 4.8.3 Low Scrub/Shrubs: Aim to thin out a further 20% of shrub groups, leaving more shrubs to the woodland edge but thin harder to the centre.
- 4.8.4 Trees: Thin single species groups to allow one or two of each group to remain with sufficient space to grow further. Aim to remove some groups of nurse species such as birch and alder completely to create shrubby clearings for biodiversity. A minimum of 20% of the area should be allowed to develop as mature tree canopy.

Years 25+:

- 4.8.5 Monitor and allow the scrubland to develop naturally. Larger heavy canopy trees such as oak or hornbeam will begin to shade out smaller competitor trees and shrubs, creating patches of woodland floor flora without other woody plants. Keep the scrubland diverse by maintaining a 20-40% tree canopy cover by removing some trees and allowing shrubby clearings to develop.

Hedgerow Planting

Years 0-5

- 4.8.6 Keep a check on rank weed growth, docks, thistles, brambles etc and aim to keep new planting free of such weeds. Allow new planting to grow for the first 5 year with minimal intervention for cutting, except for cutting back lead growth as detailed above.
- 4.8.7 Cut the hedgerow annually, alternating sides, to allow flowering and fruiting on old wood between cuts. Cut in Jan/Feb to allow maximum time for wildlife food forage and cover over

the winter months. Consider hedgerow laying every 15 years.

Years 5 to 10+:

- 4.8.8 Cut the hedgerow annually, alternating sides, to allow flowering and fruiting on old wood between cuts. Cut in Jan/Feb to allow maximum time for wildlife food forage and cover over the winter months. Consider hedgerow laying every 15 years.

5.1 MONITORING AND REVIEW

- 5.1.1 In order to ensure that the habitats created within the site reach and maintain their maximum value to nature conservation, all habitats should be monitored. Monitoring is an essential part of any management plan to:
- Ensure that the proposed management is being implemented;
 - Respond to unexpected outcomes from management; and
 - Determine if objectives are being achieved.
- 5.1.2 Site meetings should have the appointed landscape contractor in attendance to ensure landscape works are carried out in accordance with the landscape specification and schedules. Monitoring will also assess whether any changes are needed to the specified management regimes. Landscape mitigation and management works are carried out in accordance with the specification. Monitoring will also assess whether any changes are needed to the specified regimes. This will ensure the ecological specification has been fulfilled and to provide baseline data for future surveys to be monitored against.
- 5.1.3 A site wide landscape inspection should also be carried out by a suitably experienced Landscape Architect to ensure that the landscape works are undertaken in accordance with the landscape specification and schedules. Monitoring will also assess whether any changes are needed to the specified management regimes.
- 5.1.4 Monitoring results will be used to inform changes to the LEMP and five-year landscape works programme. The prescriptions provided will not be set in stone and should be altered if required in agreement with the Local Planning Authority (LPA). Should monitoring indicate conservation aims are not being met, appropriate remedial measures should be taken.