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APPENDIX 12-2

LANDSCAPE RESTORATION
METHODOLOGY

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Appendix 12-2

Proposed Quarry
Extraction and Restoration
Ballyquin, Co. Clare



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1.

PROPOSED LANDSCAPE RESTORATION PLAN (LRP)

A dedicated Landscape Restoration Plan (LRP) has been prepared as part of the Proposed Development. The details of the LRP are described below.

The LRP aims to mitigate landscape and visual impacts during active phases (extraction and infilling) of the Proposed Development. A long-term objective of the LRP is to restore the landscape of the Site to harmonise with the landform and landcover of the lands surrounding EIAR Study Area after extraction and infilling has occurred. A key component of the LRP is a nature positive design which supports the Biodiversity Enhancement and Management Plan (BEMP) which is included as Appendix 5-1 of Chapter 5. The LRP will support the BEMP in the restoration and replacement of features of the Site (e.g. hedgerows or woodland) which support biodiversity, and which will be lost during the construction, extraction or infilling phases. In a general sense, where vegetation loss will occur during extraction and infilling, planting is proposed to replace any losses with an aim of enhancing the biodiversity of the Site. The LRP shows the following 3 elements:

- Page 1 - Landscape and Visual Mitigation Measures During proposed extraction
- Page 2 - Landform Restoration during proposed infilling
- Page 3 - Landcover Restoration and Proposed Planting After infilling

Key measures and details of the LRP are reported below.

1.1

Landscape and Visual Mitigation Measures During Proposed Extraction: Berms, Seedbank Storage and Boundary Planting

Berms and Seedbank Storage: As shown in the LRP, berms are proposed along the eastern and northeastern boundary of the proposed extraction area. Topsoil extracted during excavation works will be stored in berms with overburden. The berms will be approximately 3 metres above existing ground level and 9 metres in width. The proposed berms create physical barriers which will enclose the proposed extraction area with the aim of reducing landscape and visual effects from surrounding receptors due to dense visual screening as well as acting as a buffer for other potential effects such as noise.

Proposed Planting (extraction phase): A greenfield area at the south-eastern perimeter of the Site will be subject to extraction, this area comprises agricultural land and hedgerows. Planting of native shrubs hedgerows and linear woodland is proposed beyond the berms in this area of the Site. This planting will be a replacement habitat for bats, and it is proposed to plant semi-mature vegetation and semi-mature species to ensure connectivity gains are immediate. Details of the proposed species are listed below.

Following consultation with local residents, it is proposed to bolster the existing hedgerows and treelines at the northeastern perimeter of the Site. This planting will consolidate the vegetation alongside the Fahymore North local road to provide visual screening of the Proposed Development. Also, as part of mitigation for effects of potential noise, an acoustic barrier will be installed to the south of a residential receptor immediately adjacent to the site in the townland of Woodpark. These measures, including the acoustic barrier, create a visual buffer between these residences and the Proposed Development Site to mitigate effects on residential visual amenity, reducing the likelihood of significant visual effects arising. These measures are shown in Figure 12-15 of Chapter 12.

1.2

Landform Restoration During Proposed Infilling: Re-Profiling and Spreading of Topsoil

One of the principal activities to be undertaken at the Site is for the restoration of lands within the existing and future quarry void. The quarry void shall be infilled to the point of producing a landform which effectively merges into the surrounding landscape. It is proposed to import approximately 4,471,200 tonnes of inert soil and stone material or stone by-product, or river dredge spoil for the infilling and restoration of an existing and future quarry void. It is considered that the rate of infilling and restoration will be subject to market conditions and therefore planning permission is being sought for a 20-year operation and 2-year monitoring period (22 years in total).

During infilling works, the lands around the perimeter of excavation areas will be re-profiled to link and align with the landform and topographical profile of the landscape surrounding the Site. Natural colonisation is expected to occur from the seedbanks stored within the berms. However, as detailed in the following section, it is also proposed to sow new areas of grassland with tussock grassland species in the restoration phase, following infilling.

Several existing stockpiles are currently located within the centre of the Site between the two extraction areas. The large volumes of material currently in storage piles will be sold.

1.3

Landcover Restoration and Proposed Planting After Infilling

The LRP includes a planting plan to replace and offset any vegetation lost and re-establish biodiversity corridors throughout the landscape of the Site. Hedgerows are proposed to ensure connectivity for biodiversity throughout the Site. The linear layout of hedgerow planting has been designed to emulate the irregular pattern of small field cells which exist in the wider landscape setting surrounding the Site. There is a network of linear biodiversity corridors and areas of mature woodland within the Site, and the proposed replanting will link with these existing areas to improve connectivity across the Site and wider landscape. The planting proposed for different elements of the Site are detailed below

Hedgerows and Linear Biodiversity Corridors

The LRP provides for bare-rooted native planting species in a double-staggered row in a continuous hedge. Species that will be used in the native hedgerow plant mix include:

Shrub

- > Hawthorn (*Crataegus monogyna*)
- > Blackthorn (*Prunus spinosa*)
- > Hazel (*Corylus avellana*)
- > Wild Cherry (*Prunus avium*)
- > Crab Apple (*Malus sylvestris*)
- > Grey Willow (*Salix cinerea*)
- > Goat Willow (*Salix caprea*)

Broadleaf

- > Hawthorn (*Crataegus monogyna*)
- > Blackthorn (*Prunus spinosa*)
- > Hazel (*Corylus avellana*)
- > Pedunculate Oak (*Quercus robur*)
- > Sessile Oak (*Quercus petraea*)

- > Downey Birch (*Betula pubescens*)
- > Silver Birch (*Betula pendula*)
- > Elder (*Sambucus nigra*)

Whilst all of the species above will be included, 60% of the hedgerow mix will be composed of Hawthorn, Blackthorn and Hazel.

When planting a new hedgerow, cultivating the ground is recommended, and planting in a double staggered row, which creates extra shelter for wildlife when compared to single hedgerows. Distancing between rows will be a maximum of 50cm for semi-mature plants, and 30-40cm for bare root plants. There will be 4-6 plants sown per metre, and larger trees will be planted 10-15 metres apart, and a grass margin a minimum of 1m away from the hedgerow will be created to allow suitable habitat provisions for ground-nesting birds and for foraging areas. Stakes will be required for any specimens that are over 1m in height and will be required for the first year only.

Should any replanting specimens die within the initial years, new specimens will replace the dead ones to prevent any gaps in the hedgerow forming. The new hedgerow will need to be protected from grazing by livestock, through the erection of a new stockproof fencing, where required, which should be at least 3m away from the hedge, to allow the hedgerow to mature to 2m in width and allow the 1m setback for the grass margin to remain. The placing of the stockproof fence 3m out, allows for easier management, and enables space to reach over the fence to cut grassy verges every few years and the hedgerow. In the hedgerows initial few years, regular light trimming is encouraged to form dense growth of plants. Mulch (woodchips, composed bark, sheep wool mats and/or straw) or hand cutting with a hand-held hook is recommended to prevent some species from competing with the hedgerow.

Broadleaf Planting to bolster Hedgerows

All immature broadleaf woodland currently present on the Site (western portion of the Site) will be retained, offering valuable habitat for bats, birds, and mammals. It is proposed to plant broadleaf trees every 10-15m centres along the new proposed hedgerow and linear biodiversity corridors to provide structure and diversity:

Planting - Grassland Areas

The LRP and BEMP proposes to sow new areas of grassland created during the restoration phase with tussock grassland species to provide rodent and small mammal rich habitat for birds such as owls and kestrels (nesting in the proposed wildlife tower – See Chapter 5 – *Biodiversity*) to forage on, which will be

- > Cock's-foot (*Dactylis glomerata*)
- > Red Fescue (*Festuca rubra*)
- > Yorkshire Fog (*Holcus lanatus*)
- > Creeping Bent Grass (*Agrostis stolonifera*)
- > Sweet Vernal Grass (*Anthoxanthum odoratum*)
- > Crested Dog's Tail (*Cynosurus cristatus*)
- > False Oat Grass (*Arrhenatherum elatius*)
- > Ribwort Plantain (*Plantago lanceolata*)
- > Red Clover (*Trifolium pratense*)
- > White Clover (*Trifolium repens*)
- > Common Mouse-ear Chickweed (*Cerastium fontanum*)
- > Knapweed (*Centaurea nigra*)

LRP Maintenance Measures

Maintenance measures required to facilitate the LRP are comprehensively detailed in the BEMP. The key measures are summarised below:

- New hedgerow shrub planting will be kept weed and litter free until the new plants are established, particularly from ruderal weeds. Healthy growth will be maintained by allowing the plant to occupy as much of the planting areas as possible to allow them to achieve as close their natural form as possible;
- During spring and autumn maintenance periods all trees and plants will be checked and adjusted/replaced as required, soil firmed, and any dead wood present removed back to healthy tissue and mulch added if required. Where tree stakes and ties are no longer required these will be removed to avoid damage to the tree;
- During the first growing season, all standard trees/ semi-mature trees will be watered regularly during any prolonged dry periods during the growing season (i.e. in April, May, June, July and August). During the second growing season the trees will be kept well-watered as often as required, particularly during June, July and August;
- New hedgerows should be cut annually, with the cutting height raised by 10-15cm each year. This will allow the plants to flower and produce berries whilst preventing the height of the hedgerow from increasing too rapidly;
- Any tree, hedge or shrub that is removed, uprooted, destroyed or that becomes seriously damaged, defective diseased or dead shall be replaced in the same location with another plant of the same species and size as that originally planted. All such replacements shall be carried out within the first planting season following the loss.