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ENVIRONMENTAL CONSULTANTS

Biodiversity Management Plan

**Proposed Housing Development at Lisdaran,
Co. Cavan**

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1 Introduction

This Biodiversity Management Plan (BMP) has been prepared by Flynn Furney Environmental Consultants to guide the protection and enhancement of biodiversity on the proposed development site at Lisdaran, Co. Cavan. The plan focuses on safeguarding key species present locally, including birds, bats, and badgers, and on maintaining ecological connectivity to support their movement across the landscape. The plan also prioritises the protection of the important habitats on-site, ensuring that both species and habitats are protected and can continue to thrive alongside the construction and operational phase of this project.

2 Legislation and Planning Policy

2.1 European Council Directives

2.1.1 Council Directive on the conservation of Natural Habitats of Wild Fauna and Flora

2.1.1.1 92/43/EEC- The Habitats Directive

The main aim of the Directive is to promote the maintenance of biodiversity through the conservation of natural habitats and wild species listed on the Annexes of the Directive. Member States are required to take measures to maintain or restore, at favourable conservation status, biodiversity whilst taking account of economic, social, cultural requirements and regional and local characteristics.

It gives effect to site and species protection measures through establishment of the Natura 2000 network and designation of European Sites including Special Areas of Conservation (SAC) and Special Protected Areas (SPA). It also establishes a list of species (other than birds) whose habitats must be protected to secure their survival. These priority species and habitats are subject to a higher level of protection.

The Directive also requires appropriate assessment of any plan or project not directly connected with or necessary to the management of a European Site, but likely to have significant effects upon a European site, either individually or in combination with other plans or projects.

2.1.2 Council Directive on the Conservation of Wild Birds

2.1.2.1 2009/147/EC- The Birds Directive

The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. It makes provisions for the maintenance of the wild bird populations across their natural range; conserves the habitats for rare or vulnerable species listed in Annex I and of migratory species through the classification of SPAs and provides protection for all wild birds.

2.2 Irish Legislation

2.2.1 The European Communities

2.2.1.1 (Birds and Natural Habitats) (Amendment) Regulations 2015 S.I. No. 355 of 2015

The European Communities (Birds and Natural Habitats) (Amendment) Regulations provides that the following shall be construed together as one:

- Wildlife Act 1976
- Wildlife (Amendment) Acts of 2000, 2010 and 2012
- European Communities (Birds and Natural Habitats) (Restrictions of the Use of Poison Bait) Regulations 2010
- European Communities (Birds and Natural Habitats) Regulations 2011
- European Communities (Birds and Natural Habitats) (Amendment) Regulations of 2013, 2015
- Wildlife Amendment Bill 2016 (proposed legislation)

2.2.2 European Communities (Birds and Natural Habitats)

2.2.2.1 Regulations 2011 to 2015

The Regulations give effect to requirements relating to the designation of protected sites under the Birds Directive and Habitats Directive. The Regulations provide for the protection and management of European Sites and place obligations on all public authorities to have regard to the requirements of the Habitats Directive beyond the realms of planning related consents issued under the Planning and Development Act 2000, as amended (the PDA). The Regulations also provide for the protection of species of European

importance.

2.2.2.2 Wildlife Acts 1976 to 2023

The Acts provide for *inter alia* the protection of wildlife. The Acts prohibit the intentional killing, taking or injuring of certain wild birds or wild animals; or the intentional destruction, uprooting or picking of certain wild plants.

2.2.2.3 Wildlife Amendment Bill 2016

The purpose of the Bill is to provide for the implementation of a reconfiguration of the Raised Bog Natural Heritage Area Network arising from (i) the proposals from the Review of Raised Bog Natural Heritage Area Network published in January 2014; (ii) an assessment of the effects on the environment of the proposals arising from the Review and, if required, any other screening for an assessment or as the case may be, assessment, including public consultation undertaken and (iii) observations or submissions received during the course of public consultation.

3 Description of the Proposed Development

The development will consist of the provision of a total of 111 no. residential units along with provision of a crèche. Particulars of the development comprise as follows:

- (a) Site excavation works to facilitate the proposed development to include excavation and general site preparation works.
- (b) The provision of a total of 55no. residential dwellings which will consist of 15 no. 2 bed units, 24 no. 3 bed units and 16 no. 4 bed units.
- (c) The provision of a total of 56 no. duplex apartment units consisting of 8 no.1 bed units, 20 no. 2bed units and 28 no. 3 bed units.
- (d) Provision of a two storey creche with associated parking, bicycle and bin storage.
- (e) Provision of associated car parking at surface level via a combination of in-curtilage parking for

dwellings and via on-street parking for the creche and duplex apartment units.

(f) Provision of electric vehicle charge points with associated site infrastructure ducting to provide charge points for residents throughout the site.

(g) Provision of associated bicycle storage facilities at surface level throughout the site and bin storage facilities.

(h) Utilising the existing access point from Loreto Road with associated works to provide for internal access roads, footpaths and associated site works.

(i) Provision of internal access roads and footpaths and associated works to include for regrading of site levels as required.

(j) Provision of residential communal open space and public open space areas to include formal play areas along with all hard and soft landscape works with public lighting, planting and boundary treatments to include boundary walls, railings & fencing.

(k) Internal site works and attenuation systems which will include for provision of a hydrocarbon and silt interceptor prior to discharge.

(l) All ancillary site development/construction works to facilitate foul, water and service networks for connection to the existing foul via a rising main and provision of a foul pumping station, water connections and ESB network connections.



3.1 Site Description

The proposed housing development site is situated north of Cavan General Hospital. To the north and south-east of the site, there are residential properties as well as small and medium-scale industrial buildings. Agricultural land surrounds the site to the west and east, and the site itself is predominantly agricultural. A small woodland area is located at the north-east section of the site. The site is currently used for agriculture. The site is delineated with treelines and hedgerows. Two buildings exist to the west the site (outside of the site boundary).

The closest WFD river waterbody to the site is the Cavan_010 WFD waterbody (European code: IE_NW_36C020300), locally known as the Cavan 36 river (95 m to the east of the site). This WFD river waterbody achieved an overall ‘Poor’ status based on the ‘Surface Waterbody WFD Status 2019-2024’.

The drainage ditch to the north of the site is hydrologically connected to this river. The closest WFD lake waterbody is the Coalpit lake waterbody (European code: IE_NW_36_633) which the Cavan 36 river flows into (2 km to the north of the site). This WFD lake waterbody achieved an overall ‘Poor’ status based on the ‘Surface Waterbody WFD Status 2019-2024’.

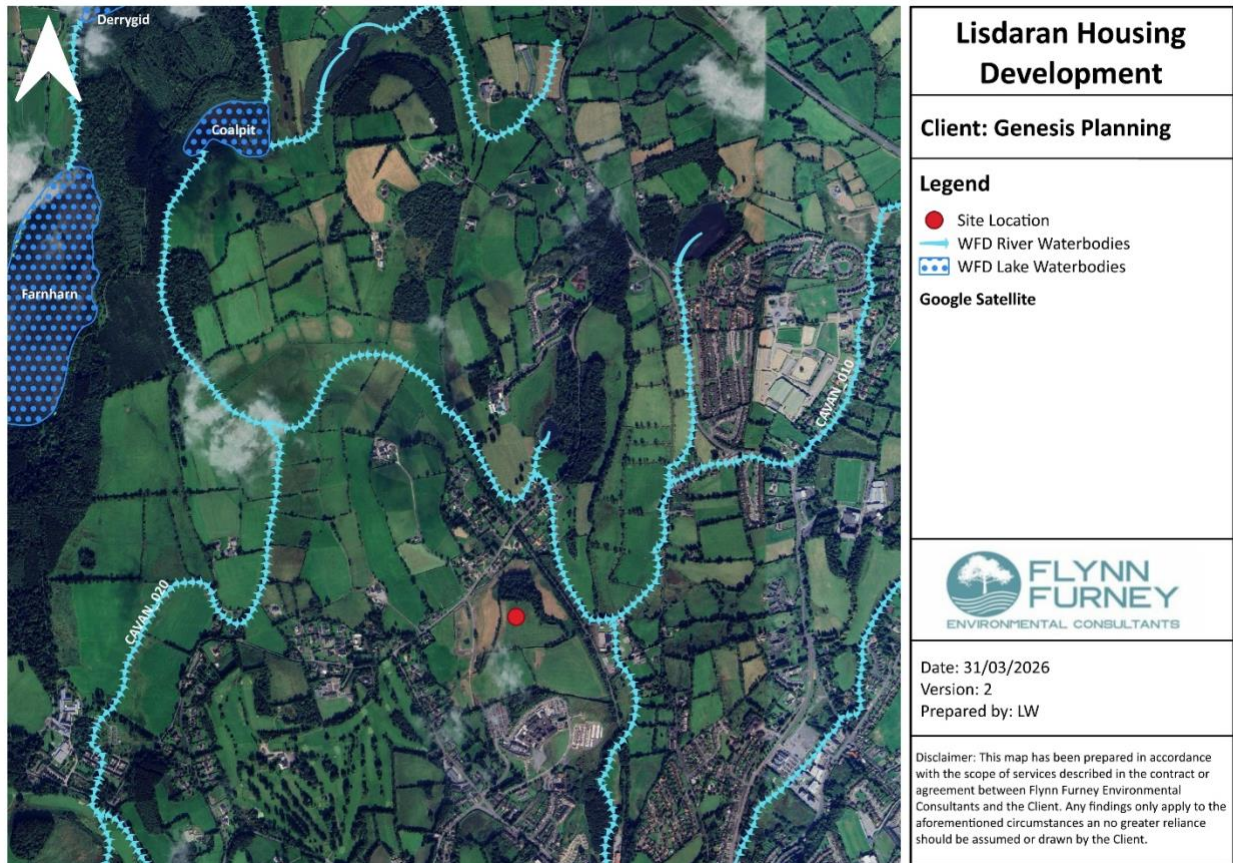


Figure 1. Surface water features surrounding the site of the proposed development

4 Existing Biodiversity On-Site

The following sections provide an overview of the habitats and wildlife present on, or likely to utilise, the site. Detailed information on habitats and species is provided in the Ecological Impact Assessment (EclA)

prepared for this site. Sensitive ecological features (e.g. badger setts locations) are not described in detail within this document to avoid potential disturbance. Relevant information will be communicated to contractors as required.

4.1 Habitats

An overview of the main habitats recorded on-site and adjacent to the site boundary is detailed below.

Habitats within the study area were mapped according to Level 3 of the Heritage Council classification (Fossitt, 2000) following the Heritage Council's Best Practice Guidance (Smith et al., 2011) and the Joint Nature Conservation Committee's (JNCC) Handbook for Phase 1 Habitat Survey - a technique for environmental audit (JNCC, 2010). The Heritage Council's *A Guide to Habitats in Ireland* (Fossitt, 2000) is the standard habitat classification system used in Ireland. Habitats were also assessed for correspondence to the Habitats Directive Annex I habitat types (European Commission, 2013).

The majority of the proposed development site fell within **Improved Agricultural Grassland (GA1)**, which was dominated by grass species such as Yorkshire Fog (*Holcus lanatus*), Perennial Rye (*Lolium perenne*), and Annual Meadow Grass (*Poa annua*). Other species present included Lesser Stitchwort (*Stellaria graminea*), Meadow Vetchling (*Lathyrus pratensis*), Creeping Buttercup (*Ranunculus repens*), Ribwort Plantain (*Plantago lanceolata*), Dandelion (*Taraxacum officinale*), Docks (*Rumex spp.*), Meadow Buttercup (*Ranunculus acris*), Meadowsweet (*Filipendula ulmaria*), Common Rush (*Juncus effusus*), Flowering Rush (*Butomus umbellatus*), Selfheal (*Prunella vulgaris*), Thistles (*Cirsium spp.*), and Nettles (*Urtica dioica*). Species composition varied across different fields on-site, with some fields cut at the time of the survey and uncut sections of grassland to the north.

Hedgerows (WL1) and **Treelines (WL2)** were present throughout the site. The treeline along the southern boundary was dominated by Ash (*Fraxinus excelsior*), with a mix of Sycamore (*Acer pseudoplatanus*), Grey Willow (*Salix cinerea*), Wych Elm (*Ulmus glabra*), Blackthorn (*Prunus spinosa*), Holly (*Ilex aquifolium*), Hawthorn (*Crataegus monogyna*), Crab Apple (*Malus sylvestris*), Ivy (*Hedera helix*), Bramble (*Rubus fruticosus*), Dog Rose (*Rosa canina*), Hogweed (*Heracleum sphondylium*), Nettles, Field Thistle (*Cirsium*

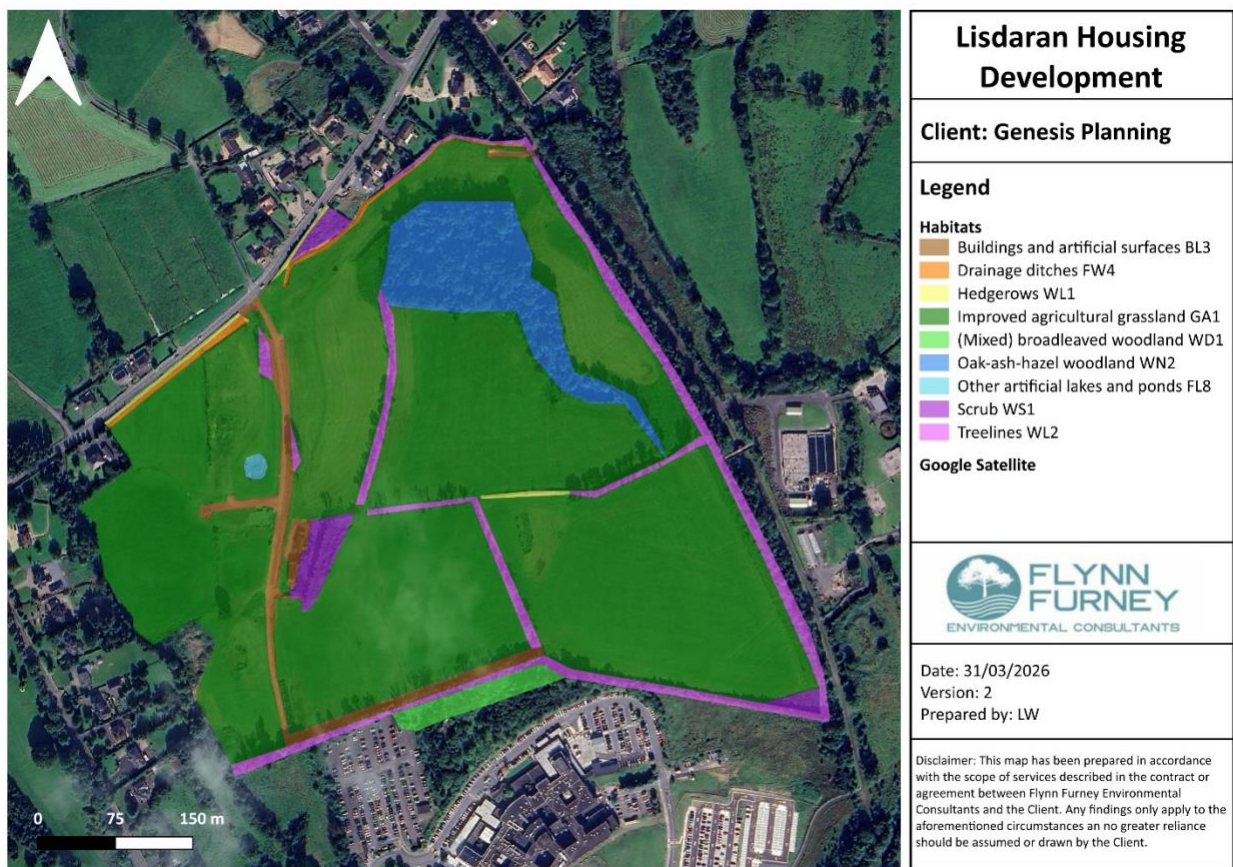
arvense), Creeping Buttercup, Bush Vetch (*Vicia sepium*), Herb Robert (*Geranium robertianum*), Hart's Tongue Fern (*Asplenium scolopendrium*), Ribwort Plantain, Hoary Willowherb (*Epilobium parviflorum*), Docks, Hawkbit (*Leontodon spp.*), Selfheal, and mosses. The treelines between fields were dominated by Ash, with a mixture of Hawthorn, Blackthorn, Holly, Willow, and Bird Cherry (*Prunus padus*) in one area. Two mature lines of Oak (*Quercus robur*) and Sycamore were present along the existing road for site access. The hedgerows contained similar species but were not dominated by mature Ash like the treeline habitats. A hedgerow of Leylandii (*x Cuprocyparis leylandii*), Privet (*Ligustrum spp.*), and Red Flowering Currant (*Ribes sanguineum*) was located between the drainage ditch to the north of the site and existing houses nearby.

A significant area of mature **Oak-Ash-Hazel Woodland (WN2)** is located on the Lisdaran site, outside the proposed development area. Holly, Hawthorn, and Beech (*Fagus sylvatica*) were scattered throughout, with patches of Scrub (WS1) mainly at the woodland edges. Noteworthy examples of mature oaks are found in the northern and south-western corners of the woodland. A **(Mixed) Broadleaved Woodland (WD1)** to the south of the site contains a mixture of Ash (suffering from Ash Dieback), Hawthorn, Holly, Scots Pine (*Pinus sylvestris*), and Sycamore. This woodland had a dense carpet of Ivy and Bramble, with occasional Honeysuckle (*Lonicera periclymenum*). Scrub occurred in various sections of the site, including a small area dominated by Gorse (*Ulex europaeus*) and Bramble in the north-west corner of one field. Another small scrub section contained Willow, Bramble, Great Willowherb (*Epilobium hirsutum*), Meadowsweet, and Bindweed (*Convolvulus arvensis*).

A **small pond (FL8)** is located in the field north-west of the existing house and barn, though it is not within the development area. The access road will pass close to it. Aquatic vegetation in the pond is dominated by Bulrush (*Typha latifolia*) and Unbranched Bur-reed (*Sparganium emersum*). A **Drainage Ditch (FW4)** was found to the north of the site, where the instream vegetation was dominated by Duckweed (*Lemna minor*). The banks of the ditch supported species such as Meadowsweet, Marsh Thistle (*Cirsium palustre*), Hairy Willowherb (*Epilobium hirsutum*), Watermint (*Mentha aquatica*), and Rosebay Willowherb (*Chamerion angustifolium*). Tutsan (*Hypericum androsaemum*) and Montbretia (*Crocsmia x crocosmiiflora*) were also recorded at various locations along the ditch.

These habitats included a mixture of grasses, Marsh Thistle, Docks, Reed Canary Grass (*Phalaris arundinacea*), Marsh Woundwort (*Stachys palustris*), and Nettles near the ditch. This area appeared to have been reseeded following disturbance, with some parts successfully recolonised while others remained mostly bare ground.

The **Buildings and Artificial Surfaces (BL3)** habitat in the area consisted of existing tarmacked roads and houses located outside the proposed development zone.



4.2 Mammals

The site is considered to be of importance to a local badger population. Field surveys undertaken in August 2024 and February 2026 recorded extensive badger activity across the site, including numerous scrapes,

snuffle holes, and well-defined trails. A badger sett with four entrances was also identified within the oak-ash-hazel woodland located to the north of the site. Survey findings indicate that badger activity within the area is high, and the proposed development site is regularly used by badgers for feeding and foraging. The identified sett lies outside the proposed development footprint.

Evidence of Pine Marten activity was found August 2024 and February 2026.

The drainage ditch located to the north of the site was also surveyed for evidence of otter activity. No signs of otters were recorded during the surveys conducted in August 2024 and February 2026, and no holts were identified along the drainage ditch. A further mammal survey employing trail cameras and targeting Otters was carried out in May 2026. No evidence of Otter activity was found. However, the absence of recorded evidence does not necessarily indicate the absence of otters from the wider area. Otters have previously been recorded in the nearby Cavan River, approximately 95 m to the east of the site, and the species is known to have a large foraging range.

4.3 Bats

A bat roost was identified within one of the existing buildings to the east of the site, outside the proposed development footprint. Given the presence of roosting bats in the immediate vicinity (in existing buildings outside of the development footprint), the existing grasslands and hedgerows/treelines within the site are likely to provide suitable feeding and foraging habitat for bats. The surrounding woodlands, treelines, and hedgerows are also likely to function as important commuting and navigation corridors.

During the ground level tree assessment in February 2026, a number of trees within the site footprint were identified as having moderate bat roost potential, primarily due to dense ivy cover which prevented potential roost features from being ruled out. In addition, one tree was assessed as having high bat roost potential, where potential roost features were observed.

4.4 Birds

The site is also known to be of importance to birds. Several species were recorded during the 2024 survey,

including Goldfinch (*Carduelis carduelis*), House Martin (*Delichon urbicum*), Long-tailed Tit (*Aegithalos caudatus*), Wren (*Troglodytes troglodytes*), Robin (*Erithacus rubecula*), Mistle Thrush (*Turdus viscivorus*), and Buzzard (*Buteo buteo*). During this survey, several species were also observed flying overhead, including Cormorant (*Phalacrocorax carbo*) and Grey Heron (*Ardea cinerea*).

During the February 2026 survey, several species were recorded including Chaffinch (*Fringilla coelebs*), Great Tit (*Parus major*), Long-tailed Tit, Jackdaw (*Coloeus monedula*), Magpie (*Pica pica*), Redwing (*Turdus iliacus*), and Song Thrush (*Turdus philomelos*). Additionally, two Buzzards were observed emerging from the oak-ash-hazel woodland and were likely nesting within this woodland habitat.

The woodland habitat to the north of the site, along with the treelines and hedgerows, provide important nesting habitat for bird species, as well as commuting corridors. The grassland habitats are likely used for feeding and foraging, while areas of scrub provide cover and potential nesting habitat.

4.5 Amphibians

Due to the timing of the 2024 survey, no evidence of frog or other amphibian breeding activity was recorded. However, a frog (*Rana temporaria*) was observed within the agricultural grassland inside the footprint of the proposed development.

During the February 2026 survey, no evidence of amphibian breeding activity was recorded within the drainage ditches located within the development site, or within the pond located to the west of the site (outside the development footprint). However, another frog was observed on the footpath near the existing site entrance, indicating the presence of amphibians in the surrounding area.

During the 2026 survey, a potential amphibian habitat was also noted at 641134.545,806325.657 ITM. The grasslands and drainage ditch habitats within the site are likely to provide feeding and foraging habitat for amphibians, and may also provide potential breeding habitat.

5 Overview of Potential Impacts of the Development

5.1 Construction Phase

During the construction phase, ecological receptors may be subject to a range of temporary and permanent impacts associated with site clearance, earthworks, and development activities. Disturbance will arise from increased noise, vibration, lighting, and human activity, which may result in temporary displacement or avoidance behaviour by breeding birds, amphibians, and mammals using the site and adjacent habitats. Although no bat roosts are located within the development footprint, there is potential for indirect disturbance to the nearby off-site roost through increased artificial lighting and activity along commuting routes. Badgers recorded in woodland to the north may experience temporary disruption to foraging movements, while otters using drainage ditches for commuting may be sensitive to construction activity in proximity to watercourses.

The construction phase will also result in the permanent loss of improved agricultural grassland, scrub, and treeline habitats within the site boundary. This will reduce available foraging and breeding resources and contribute to increased habitat fragmentation, particularly affecting species reliant on linear features such as hedgerows and treelines for movement. In addition, habitat degradation may occur at the edges of retained areas due to edge effects, including increased disturbance and changes in habitat conditions.

There is also potential for impacts on water quality within drainage ditches during construction, particularly from sediment runoff, siltation, and accidental pollution events associated with fuels, oils, concrete washout, and construction materials. Such effects could impact amphibians using ditches for breeding and otters commuting through aquatic corridors. Waste generated during construction, if not properly managed, could also result in indirect ecological effects through contamination or encroachment into sensitive habitats, particularly if stockpiles are not appropriately located and contained.

In addition, there is a risk of the spread of invasive alien species during construction through soil movement, machinery, and vegetation clearance. Disturbed ground, drainage corridors, and stockpiled materials may be particularly vulnerable to spread invasive species if biosecurity measures are not

effectively implemented in accordance with the site-specific invasive species management plan.

5.2 Operational Phase

During the operational phase, the site will transition from semi-natural habitats to a residential environment comprising dwellings, roads, and managed open space, resulting in a long-term reduction in habitat availability for breeding birds, amphibians, and terrestrial fauna. This permanent habitat loss, combined with the introduction of built structures and infrastructure, will increase habitat fragmentation and reduce ecological connectivity across the site and surrounding landscape. While landscaped areas, gardens, and SuDS features may provide some compensatory habitat, these are generally of lower ecological value than those lost.

Ongoing disturbance will arise from increased human presence, domestic activity, lighting, and traffic associated with the development. Artificial lighting in particular may affect bat commuting and foraging behaviour, potentially impacting connectivity to the nearby off-site roost. Badgers may continue to experience disturbance along site boundaries due to increased human activity, while otters using nearby drainage ditches may be indirectly affected by changes in lighting, hydrology, and long-term anthropogenic pressure near aquatic corridors.

Water quality within drainage ditches may also be affected during operation through increased surface water runoff from impermeable surfaces, potentially introducing hydrocarbons, sediments, and nutrients into aquatic environments. Although SuDS measures will be incorporated to manage runoff, residual risks remain during high rainfall events or accidental spillages, which could affect amphibians and other aquatic-dependent species.

Waste generation during the operational phase may indirectly affect biodiversity if not properly managed. Poor waste storage or disposal could lead to littering of green spaces or drainage features, potentially causing localised habitat degradation or disturbance to wildlife.

Additionally, there is a long-term risk of invasive alien species introduction or spread through ornamental planting, garden escapes, or landscaping activities. If non-native species are introduced or become

established, there is potential for spread into adjacent habitats, particularly along drainage corridors and green infrastructure links.

6 Biodiversity Enhancement, Mitigation & Protection Measures

6.1 Wildlife Disturbance

6.1.1 Construction Phase

The proposed development, consisting of 111 dwellings and associated facilities, has the potential to cause disturbance to wildlife during the construction phase. Several species known to use the site including mammals, amphibians, birds, and bats may be affected.

Construction activities will involve site preparation works such as vegetation clearance, as well as the creation of access roads through existing grassland. A temporary site compound will also be established, including offices, welfare facilities, and machinery storage areas. Heavy machinery will be in operation throughout this phase.

During this phase, disturbance to fauna may arise from a range of sources including noise from machinery and construction activities, ground vibration from excavation works, artificial lighting associated with construction activities, increased human presence on-site, and visual disturbance from moving vehicles and equipment. These factors have the potential to interfere with normal behaviours such as foraging, commuting, breeding, and resting, and may result in the temporary displacement of species from the site and surrounding area.

6.1.2 Measures to Mitigate Against Wildlife Disturbance in the Construction Phase

To minimise disturbance impacts on wildlife both on and surrounding the site during the construction phase, the following mitigation measures should be implemented:

6.1.2.1 Bats

- Retain mature treelines and boundary features where feasible.

- No works will be undertaken to structures known to support bat roosts.
- Implement a sensitive lighting strategy across the site to minimise disturbance to bats.
- Ensure all construction lighting is low-level, directional, and hooded to prevent light spill onto treelines, hedgerows, and commuting routes.
- Use warm spectrum lighting (<3000K) to reduce disturbance effects on bat activity.
- No night-time working or after-dark construction activities will be permitted at any stage of the development.
- Avoid sudden changes in lighting intensity (e.g. high-output floodlighting) during construction.
- Maintain dark corridors along retained boundary features to support commuting bats.
- Minimise noise and vibration through appropriate equipment selection and working methods.
- Toolbox talks will be provided to site personnel regarding bat protection and disturbance avoidance.

6.1.2.2 Birds

- All clearance of tall vegetation (woody or herbaceous) will be undertaken outside the bird breeding season (1st March to 31st August inclusive).
- Where this seasonal constraint cannot be adhered to, the area of proposed clearance will be checked for nesting birds by a suitably qualified ecologist.
- If nesting birds are identified, clearance works will be suspended in the relevant areas until nesting has finished.
- All construction works will be restricted to daylight hours only - no night-time works will occur.
- Avoid noisy or highly visible works during early morning or evening periods where practicable to reduce disturbance to birds.
- Toolbox talks will be provided to site personnel regarding nesting bird protection and disturbance avoidance.

6.1.2.3 Badgers

- Pre-construction checks will be undertaken by a suitably qualified ecologist prior to vegetation clearance near sett areas.

- All hedgerows and treelines within the development outline that will be removed will be cleared under supervision due to the presence of an active badger sett in the oak-ash-hazel woodland.
- Badger sett tunnel systems may extend up to c.20 m from sett entrances. Therefore, outside of the breeding season (July to November inclusive) no heavy machinery shall be used within 30 m of badger setts, lighter machinery (e.g. wheeled vehicles) shall not be used within 20 m of sett entrances and light manual works (e.g. hand digging or scrub clearance) shall not take place within 10 m of sett entrances.
- During the breeding season (December to June inclusive), no works shall be undertaken within 50 m of active setts, and no blasting or pile driving shall occur within 150 m of active setts.
- All badger setts shall be clearly marked on site, with exclusion zones delineated using robust fencing and signage.
- Bunting may be used temporarily however hazard tape is not considered sufficient due to weathering and livestock damage.
- Post and rail fencing incorporating planting shall be used where appropriate to define long-term protective boundaries and maintain mammal movement.
- All excavations on-site will be covered or securely fenced at the end of each working day to prevent badgers becoming trapped.
- Mammal escape ramps will be installed in all deep excavations.
- No night-time working will be undertaken on-site.
- Artificial lighting will not be directed towards setts or commuting routes.
- Site personnel will be briefed on badger sensitivity zones and required buffer distances prior to works commencing.
- Toolbox talks will be provided to site personnel regarding badger protection and disturbance avoidance.

6.1.2.4 Otters

- Maintain a minimum buffer from the drainage ditch and restrict all construction activities outside this zone (10 m).

- All works will be undertaken during daylight hours only - no night-time works will be permitted.
- Implement low-level, directional, and hooded lighting to prevent illumination of the drainage ditch.
- No artificial lighting spill shall occur onto the drainage ditch or adjacent banks.
- Cover or fence all excavations at the end of each working day to prevent otters from becoming trapped.
- Install mammal escape ramps in any deep excavations.
- Cease works immediately if an otter is encountered and consult a suitably qualified ecologist.
- Avoid sudden increases in noise or vibration near the drainage ditch.
- See Section 6.4 Water Quality for measures to mitigate against water quality degradation.

6.1.2.5 Amphibians

- Area of works will be strictly delineated prior to commencement.
- Drainage ditches will be maintained where possible during construction activities.
- See Section 6.4 Water Quality for measures to mitigate against water quality degradation.

6.1.2.6 Additional General Disturbance Measures

- Establish clear site boundaries with fencing prior to commencement of works to reduce incidental encroachment into adjacent sensitive areas.
- Implement a controlled site access protocol to reduce unnecessary movement of personnel and vehicles across the site.
- Minimise reversing of vehicles where possible to reduce intermittent high-level noise disturbance.
- Use banksmen where reversing is unavoidable to reduce prolonged alarm noise activation.
- Avoid the use of sudden high-intensity alarm systems or tonal warning devices where alternatives are available.
- Stagger delivery schedules to reduce periods of peak traffic activity and associated disturbance.
- Limit queuing of HGVs and construction vehicles on-site or at site entrances to reduce prolonged noise exposure.
- Position noisy plant equipment (e.g. generators or compressors) away from sensitive boundary

features where possible.

- Use acoustic shielding or temporary noise barriers around stationary high-noise equipment where necessary.
- Avoid unnecessary vehicle movements during quieter periods of ecological sensitivity (early morning and late evening within working hours).
- Ensure site lighting is switched off when not required for operational safety or security purposes.
- Prohibit the use of radios or amplified sound equipment on-site where they may contribute to additional disturbance of wildlife.
- Maintain consistent working areas to avoid progressive spread of disturbance into undisturbed parts of the site.
- Avoid simultaneous operation of multiple high-vibration activities in close proximity where feasible.

6.1.3 Operational Phase

During the operational phase, there is potential for ongoing disturbance effects associated with the occupation and use of the development. These may arise from increased levels of artificial lighting, noise from residential activities and vehicular movements, and general human presence within the site. Such disturbance has the potential to affect the behaviour of species using the site and surrounding habitats, particularly nocturnal and light-sensitive fauna such as bats, badgers, and otters, as well as breeding birds and amphibians in adjacent areas. While these effects are expected to be less intensive than during construction, they are likely to be long-term in nature, and therefore require appropriate mitigation to minimise disturbance impacts.

6.1.4 Measures to Mitigate Against Wildlife Disturbance in the Operational Phase

To minimise disturbance impacts on wildlife both on and surrounding the site during the operational phase, the following mitigation measures should be implemented:

6.1.4.1 Bats

- Implement a site-wide lighting strategy to ensure minimal disturbance to bat commuting and

foraging activity along treelines and boundary features.

- Maintain dark corridors along retained or new linear features to allow continued bat movement across and around the site, particularly along proposed pathways where linear planting (hedgerows/treelines) is feasible along these corridors.
- Avoid unnecessary external lighting during night-time hours, particularly in areas adjacent to treelines/hedgerows or woodland.
- All luminaires should lack UV elements when manufactured
- Metal halide, compact fluorescent sources must not be used.
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white light source (2700 Kelvin or lower) should be adopted to reduce blue light component.
- Light sources should feature peak wavelengths higher than 550 nm to avoid the component of light most disturbing to bats.
- Column heights should be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards.
- Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, should be considered - See ILP GN01.
- Luminaires should always be mounted horizontally, with no light output above 90° and/or no upward tilt.
- The use of bollard or low-level downward-directional luminaires is strongly discouraged. This is due to a considerable range of issues, such as unacceptable glare, poor illumination efficiency, unacceptable upward light output, increased upward light scatter from surfaces and poor facial recognition which makes them unsuitable for most sites. Therefore, they should only be considered in specific cases where the lighting professional and project manager are able to resolve these issues.
- Only if all other options have been explored, accessories such as baffles, hoods or louvres can be

used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely.

- Ensure no artificial lighting is directed onto treelines, hedgerows, woodlands, drainage ditches or commuting corridors at any time.
- Limit lighting to essential safety areas only, avoiding over-illumination of residential streets and gardens.
- Discourage installation of additional private lighting (e.g. uplighting or decorative garden lighting) near boundary features or hedgerows/treelines and woodland.

6.1.4.2 Birds

- Avoid unnecessary artificial lighting during night-time hours to reduce disturbance to nocturnal bird species.
- Discourage prolonged external noise sources (e.g. amplified music or loud garden equipment) near hedgerows/treelines or woodland vegetation.
- Promote awareness of nesting bird sensitivity through resident information materials.
- Encourage reduced use of high-intensity garden lighting during dusk and night-time periods.

6.1.4.3 Badgers

- Avoid directing artificial lighting towards hedgerows/treelines or woodland habitats and known badger commuting routes.
- Maintain low levels of external lighting across the development during night-time hours.
- Encourage residents to minimise unnecessary night-time noise in external garden areas.
- A 5-10 metre-wide buffer of blackthorn must be established around the existing oak-ash-hazel woodland to deter people and pets (such as dogs) from entering and disturbing the badgers and their setts.
- Limit external lighting in rear gardens adjacent to hedgerows/treelines and woodland, particularly in the houses to the north of the site which are adjacent to the oak-ash-hazel woodland.

6.1.4.4 Otters

- Ensure external lighting does not illuminate the drainage ditch or riparian corridor at any time.
- Maintain dark conditions along the watercourse to avoid disturbance to nocturnal movement.
- Discourage garden or security lighting directed towards the ditch.
- Avoid installation of lighting that creates continuous illumination along the northern boundary.
- Encourage low-noise residential activity near the watercourse during night-time hours.
- Discourage reflective lighting or surfaces that may increase light spill into riparian areas.
- Promote awareness among residents of the sensitivity of aquatic mammals to light and noise disturbance.

6.1.4.5 Amphibians

- Maintain low levels of external lighting to reduce disturbance to nocturnal movement and activity.
- Avoid prolonged illumination of ground-level habitats, particularly near grassland habitats or the drainage ditch.
- Discourage bright garden lighting in areas adjacent to vegetated or damp habitats.

6.1.4.6 Additional General Disturbance Measures

- Restrict unnecessary external lighting during night-time hours across the development.
- Maintain overall low-light environment across the site.
- Encourage residents to avoid excessive garden lighting and noise during night-time periods.
- Promote awareness of nearby ecological sensitivities through resident information materials.
- Avoid prolonged or repetitive night-time disturbance activities in external residential areas.
- Encourage general “dark skies” principles where compatible with safety requirements.

6.2 Habitat Degradation, Fragmentation or Loss

6.3 Construction Phase

The proposed development, consisting of 119 dwellings and associated infrastructure, will result in the loss, fragmentation, and degradation of habitats within the site during the construction phase. The development footprint is primarily located on agricultural grassland, much of which will be permanently lost, along with sections of hedgerows/treelines and associated scrub habitats. These features currently provide ecological connectivity, shelter, and foraging opportunities for a range of species.

The partial removal of treelines will contribute to habitat fragmentation, reducing the availability of linear corridors that are important for wildlife movement. Although badgers are known to occupy oak-ash-hazel woodland habitat outside of the immediate works footprint, treelines within the site are likely used as commuting routes. The loss of some of these features may therefore disrupt established movement patterns and reduce connectivity between foraging areas.

Similarly, bats roost in structures outside the site but in close proximity to the proposed works (existing buildings to the west). Treelines within the site likely function as important commuting and foraging corridors, and their removal or degradation may impact bat activity by reducing navigational features and shelter from light and wind.

Bird species will also be affected through the loss of nesting habitat, shelter, and commuting routes associated with treelines and scrub vegetation. The removal of these habitats may result in displacement and a reduction in available breeding and foraging resources within the local area.

Amphibians, including frogs, may experience a loss of terrestrial foraging and sheltering habitat due to the removal of grassland and vegetation. Additionally, a drainage ditch within or adjacent to the site may provide suitable habitat for amphibians, particularly for breeding. Construction activities have the potential to degrade this habitat through changes in water quality, sedimentation, or accidental pollution events.

Otters may also utilise the drainage ditch as a commuting or foraging corridor. Any deterioration in water quality of this feature during construction could negatively affect its suitability for otters and other aquatic or semi-aquatic species.

Overall, the construction phase will result in a reduction in habitat availability, a loss of ecological connectivity, and the degradation of habitats used by a range of species. These impacts have the potential to disrupt key ecological functions such as commuting, foraging, breeding, and sheltering, and may lead to the displacement of fauna from the site and its immediate surroundings.

Highly important habitats on-site such as oak-ash-hazel woodland and the drainage ditch to the north of the site have the potential to be degraded, fragmented or lost during the construction phase without mitigation measures. Additionally, a substantial area of agricultural grassland will be lost. Although this habitat type is of low ecological value due to its low species diversity, it is still an important habitat for many species as a feeding/foraging habitat.

6.3.1 Measures to Mitigate Against Habitat Degradation, Fragmentation or Loss in the Construction Phase

To minimise habitat degradation, fragmentation and loss both on and surrounding the site during the construction phase, the following mitigation measures should be implemented:

6.3.1.1 Bats

- Before any trees are removed, those identified as having ‘moderate’ or ‘high’ potential should undergo a bat assessment. This should involve an endoscopic inspection conducted by a bat expert to check for potential roost features (PRFs) and determine their suitability for bat roosting. The findings will inform detailed mitigation measures related to tree felling and subsequent planting.
- Any trees with high PBRs, e.g. with crevices, hollows, etc., should be removed while a bat specialist is present to deal with any bats found.
- Any bats discovered during works can be retained in a box until dusk and released on-site.
- Trees proposed to be felled and identified with PBRs should be felled on mild days during the

autumn months of September to November or Spring months of February and March (felling during the spring or autumn months avoids the periods when the bats are most active).

- Any ivy-covered trees which require felling should be pushed over and left to lie for 24 hours after felling to allow any bats hidden beneath the ivy cover to escape.
- The buildings outside of the footprint of the proposed development are considered to have varying levels of suitability from roosting bats with low suitability in the outhouses and medium to high suitability in the vacant house and barn (Collins 2023). Any alterations to the vacant house should be preceded by interior and exterior surveys of the building followed by dusk bat emergence surveys.
- As the house is a confirmed bat roost (7th September 2021) and afforded legal protection, the inspections must be carried out by a licenced bat ecologist.
- Any alterations to the barn or outhouses should be preceded by interior and exterior surveys of the buildings followed by dusk bat emergence surveys. Surveys should be undertaken during May to September with at least three surveys recommended during this period.
- Retention of treelines will maintain commuting corridors and reduce fragmentation of bat foraging routes.
- Where treeline removal is required, connectivity between retained sections will be maintained where feasible.
- Replacement planting will be implemented to restore lost linear features.
- Any reinstatement planting will aim to reconnect fragmented habitats as early as practicable.

6.3.1.2 Breeding Birds

- All clearance of tall vegetation (woody or herbaceous) to facilitate construction works will be undertaken outside of the breeding bird season (1st March to 31st August, inclusive).
- Where this seasonal constraint cannot be adhered to, the area of proposed clearance will be checked for nesting birds by a suitably qualified project ecologist. If birds are encountered, clearance works will be suspended in the relevant areas until nesting has finished.
- Retention of treelines, hedgerows, and scrub will minimise loss of nesting and sheltering habitat.
- Vegetation clearance will be minimised to what is strictly necessary to reduce overall habitat loss.

- Habitat connectivity will be maintained through retention of linear features where possible.
- Replacement planting will be implemented to restore lost linear habitat.
- Any reinstatement planting will aim to reconnect fragmented habitats as early as practicable.

6.3.1.3 Badgers

- Pre-construction surveys will be undertaken to confirm the continued absence/presence of badger setts within the works footprint and to identify any changes in activity in adjacent habitats.
- Retention of treelines and hedgerows used as commuting routes will be prioritised to minimise habitat fragmentation and maintain connectivity between the woodland and foraging areas.
- Where treeline loss is unavoidable, gaps will be minimised to reduce fragmentation of commuting routes.
- Temporary habitat corridors will be maintained where possible to allow continued movement through the site during construction.
- Any reinstatement planting will aim to reconnect fragmented habitats as early as practicable.

6.3.1.4 Otters

- Vegetation along the drainage ditch will be retained where possible to prevent habitat degradation and maintain continuous linear cover.
- Crossing points or breaks in vegetation along the ditch will be minimised to avoid fragmentation of this corridor.
- Any temporary loss of bank-side vegetation will be reinstated as soon as practicable to restore habitat continuity.
- Riparian planting along the drainage ditch should be carried out at the earliest stage possible prior to construction to create a natural buffer between the works and the ditch.
- See Section **6.4** Water Quality for measures to mitigate against water quality degradation.

6.3.1.5 Amphibians

- Area of works must be strictly delineated and drainage ditches to be maintained where possible.
- The drainage ditch which exists to the northern boundary of the site and the potential amphibian

habitat at 641134.545,806325.657 ITM should be monitored during the breeding season for signs of spawn.

- Minimising the footprint of vegetation clearance will reduce loss of terrestrial foraging habitat.
- Retention of marginal vegetation along the drainage ditch will maintain habitat structure and reduce degradation.
- Habitat connectivity between terrestrial and aquatic habitats will be maintained where possible.
- See Section 6.4 Water Quality for measures to mitigate against water quality degradation.

6.3.1.6 Treelines and Hedgerows

- All sections of hedgerows and treelines to be retained will be fenced off at the outset of works and for the duration of construction to avoid damage to the trunk, branches or root systems of the trees. Retention of these features will reduce habitat loss and maintain ecological connectivity across the site.
- Temporary fencing will be erected at a sufficient distance from trees and hedges to enclose the Root Protection Areas (RPAs) of the larger trees that are not within the works areas (National Roads Authority, 2005- 2011). In general, the RPA covers an area equivalent to a circle with a radius 12 times the stem diameter (measured at 1.5m above ground level for single-stemmed trees).
- Soil will not be placed within the Root Protection Area for retained trees or within 5 m of hedgerows.
- Fragmentation will be minimised by retaining continuous sections of hedgerows and treelines where feasible.

6.3.1.7 Oak-Ash-Hazel Woodland

- This woodland will be fenced off at the outset of works and for the duration of construction to avoid damage to the trunk, branches or root systems of the trees.
- Temporary fencing will be erected at a sufficient distance from trees to enclose the Root Protection Areas (RPAs) of the larger trees that are not within the works areas (National Roads Authority, 2005- 2011). In general, the RPA covers an area equivalent to a circle with a radius 12

times the stem diameter (measured at 1.5m above ground level for single-stemmed trees). This buffer will be maintained to prevent indirect degradation of the woodland during construction.

- This woodland will be fully retained to avoid habitat loss and prevent fragmentation of this higher value habitat.

6.3.1.8 Grasslands

- All areas of retained grassland will be clearly delineated prior to works commencing to prevent accidental loss or degradation during construction.
- Where grassland is to be retained, it will be protected from vehicle movement, storage of materials, and construction-related compaction to avoid habitat degradation.
- Topsoil stripping (where required) will be undertaken carefully and stored in separate, low banded piles to preserve seed bank viability and prevent nutrient runoff.
- Soil storage areas will be located away from retained grassland habitats to avoid indirect impacts such as smothering or nutrient enrichment.
- Temporary fencing will be installed around retained grassland areas to prevent encroachment and maintain habitat integrity.
- Any reinstatement of grassland following construction will use appropriate native wildflower or grassland seed mixes to restore habitat function.

6.3.1.9 Additional General Habitat Degradation, Fragmentation or Loss Measures

- The footprint of works will be minimised where possible to reduce habitat loss, particularly in areas of higher ecological value.
- Clearly defined working areas will be established to prevent unnecessary encroachment into retained habitats such as treelines, hedgerows, and woodland.
- All retained habitats will be protected in accordance with outlined fencing and RPAs measures to prevent degradation.
- Habitat fragmentation will be minimised through the retention of continuous sections of treelines and hedgerows wherever feasible.
- Where removal of linear features is unavoidable, the extent of breaks will be minimised to reduce

severance of ecological corridors.

- Temporary fragmentation of habitats will be reduced by maintaining connectivity across the site where possible during works.
- Construction activities will be managed to prevent indirect habitat degradation (e.g. through soil compaction, vegetation damage, or accidental encroachment).
- Storage of materials, machinery movement, and site compounds will be located away from retained habitats to avoid degradation.
- All construction personnel will be made aware of sensitive habitats on-site and the importance of their protection.
- Any accidental damage to retained habitats will be addressed promptly with appropriate reinstatement measures.

6.3.2 Operational Phase

During the operational phase of the proposed development, permanent habitat loss and fragmentation will have occurred as a result of the construction of dwellings and associated infrastructure on previously undeveloped agricultural grassland and the partial removal of treelines and hedgerows. This will result in a reduction in available foraging, commuting, and sheltering habitat for a range of species including bats, birds, badgers, amphibians, and otters. In particular, the loss and fragmentation of linear features such as treelines and hedgerows may reduce connectivity across the site, limiting movement between habitats and isolating ecological resources.

As such, habitat enhancement and restoration measures are required to ensure that, during the operational phase, sufficient habitat is available to support these species. Enhancing retained habitats and reinstating ecological corridors will be critical to offset habitat loss, reduce fragmentation, and maintain functional connectivity across the landscape.

6.3.3 Measures to Mitigate Against Habitat Degradation, Fragmentation or Loss in the Operational Phase

To minimise habitat degradation, fragmentation and loss both on and surrounding the site during the

operational phase, the following mitigation measures should be implemented:

6.3.3.1 Bats

- Landscape planting is to include seed/fruit bearing plants and flowering plants attractive to invertebrates. There is opportunity to expand habitat corridors on site through the planting of native shrubs and trees.
- Night-flowering plants (e.g. honeysuckle *Lonicera periclymenum*) and strong smelling plants should be included within the planting plan on completion to attract night pollinators for bats.
- The boundary hedges should be enhanced and maintained with replacement native tree planting wherever gaps occur.
- Gaps in the hedgerows should be planted as part of the development; many bats will avoid even small gaps in treelines and hedgerows that are used for commuting and foraging. It is important to ensure connectivity is maintained as much as possible between foraging areas. This helps maintain the broader green infrastructure network. This allows small fragmented blocks of habitat to operate as one bigger block (Gunnell et al., 2012).
- Planting will be required to mitigate for tree removal and landscaping plans will be required for planting with similar native species.
- The erection of bat boxes will be required to mitigate for the loss of trees. The number of bat boxes is calculated according to the number of trees to be felled and their PBR value.
- Bat box locations (exact trees for erection of bat boxes) should be undertaken by bat specialist prior to construction works being undertaken.
- The wooded area in the north-west section of the overall site would have trees appropriate for a bat box scheme. Bat boxes should be inspected by a licenced bat ecologist at yearly intervals to monitor uptake of boxes and supervise relocation of boxes if not utilised by bats within 2 years of installation.
- All new planting should aim to create continuous, unlit commuting corridors linking retained treelines, hedgerows, and off-site habitats.
- Native tree and shrub planting along roads, boundaries, and open spaces will be designed to reconnect fragmented habitats, enhance existing habitats and also create new ones.

- See Section **6.3.3.10** Grasslands for measures to enhance retained/new grassland habitats on-site for feeding and foraging opportunities.

6.3.3.2 Birds

- Landscape planting is to include seed/fruit bearing plants and flowering plants attractive to invertebrates.
 - Landscape planting to be guided by recommendations given in All-Ireland Pollinator Plan.
- Integrated bird nesting features (e.g. swift bricks, house martin cups, swallow nesting ledges) will be incorporated into new buildings where appropriate.
- A range of bird boxes (e.g. tit boxes, robin boxes, starling boxes) will be installed on retained trees and buildings across the site.
- Planting schemes will include native berry- and seed-producing species (e.g. hawthorn, blackthorn, elder) to provide foraging resources.
- Treelines, hedgerows, and scrub planting will be designed to restore nesting, sheltering, and commuting habitat lost during construction.
- See Section **6.3.3.10** Grasslands for measures to enhance retained/new grassland habitats on-site for feeding and foraging opportunities.

6.3.3.3 Additional Nest Box Information

In accordance with guidance from BirdWatch Ireland, artificial nesting features should be incorporated into the development to compensate for the loss of natural nesting habitat and to enhance breeding opportunities for a range of bird species during the operational phase. A variety of bird boxes and integrated nest features should be installed on buildings (including residential units and the creche) and on retained mature trees across the site.

Swift bricks should be incorporated at high level (typically ≥ 5 m above ground) on suitable elevations of buildings, including the creche, in clusters of at least 3-5 units, as Common Swift (*Apus apus*) is a colonial species. These should be located on north or east-facing aspects where possible and spaced at least 0.5-1 m apart. Nest cups for House Martin (*Delichon urbicum*) should be installed under eaves of buildings, also in small groups, with a clear flight path and at a similar height ($\geq 3 - 5$ m), while Swallow (*Hirundo*

rustica) nesting opportunities can be provided via open-fronted nest boxes or ledges within suitable sheltered structures such as car ports or open sheds.

In addition, a range of general purpose nest boxes should be installed on retained trees and buildings to support a variety of species such as Tits (*Paridae*), Robins (*Erithacus rubecula*), and Starlings (*Sturnus vulgaris*). These boxes should be spaced approximately 10 - 20m apart (depending on species) to reduce competition and should be mounted at heights of 2 - 4m with entrances facing away from prevailing winds. Starling boxes may be installed slightly higher (3 - 5m) and can be grouped where appropriate. All boxes should be positioned to avoid excessive sun exposure and direct exposure to prevailing south-westerly winds. The distribution of nesting features across the site, particularly along retained and newly planted treelines and green corridors, will help to offset habitat loss and fragmentation by providing alternative nesting opportunities and supporting local bird populations in the long term.

6.3.3.4 Badgers

- Post and rail fencing incorporating landscape planting would be the most beneficial outer boundary, allowing for the free movement of mammals and avoiding any hinderance to movement and foraging.
- Native planting (e.g. Elder, Hazel, Blackthorn, Hawthorn) will be incorporated to provide foraging resources such as berries, nuts, and associated invertebrates.
- All site boundaries, pathways, and green corridors will include native tree and hedgerow planting to facilitate movement and reduce fragmentation.
- Continuous vegetated corridors will be maintained to connect the site with adjacent habitats, particularly woodland areas used by badgers.
- Boundary treatments will avoid impermeable fencing where possible to allow continued movement of badgers across the site.
- A 5 - 10 m buffer of Blackthorn will be planted around the existing oak-ash-hazel woodland to protect this habitat where the badger sett is present.
- See Section **6.3.3.10** Grasslands for measures to enhance retained/new grassland habitats on-site for feeding and foraging opportunities.

6.3.3.5 Otters

- Vegetation will be established along the development-side (south) bank of the drainage ditch to create a continuous riparian corridor.
- Native riparian planting (e.g. Willow, Alder, marginal vegetation) will be used to enhance habitat structure and cover.
- The drainage ditch will be maintained as a continuous linear feature to avoid fragmentation of commuting routes.
- Buffer planting will be implemented along the ditch to provide screening and improve habitat suitability for otters.

6.3.3.6 Amphibians

- Areas of grassland should be retained or recreated to provide shelter and a feeding/ foraging area for amphibians, which should be guided by the All-Ireland Pollinator Plan.
- New ponds or small wetland features will be created within suitable areas of the site to provide breeding habitat.
- Wetland margins will be planted with native vegetation to provide shelter and foraging opportunities.
- Habitat connectivity between ponds, drainage features, and terrestrial habitats will be maintained through vegetated corridors.
- Log piles, stone refugia, and rough grassland areas will be incorporated to provide sheltering habitat.
- See Section **6.3.3.10** Grasslands for measures to enhance retained/new grassland habitats on-site for feeding and foraging opportunities.

6.3.3.7 Additional Pond Information

As there is potential for potential amphibian habitat to be intersected/lost at approx. 641134.545,806325.657 ITM, new ponds should be created on-site to provide breeding habitats for amphibians on-site. These ponds will create optimal wet conditions for wetland species to thrive. This could include plants such as Meadowsweet (*Filipendula ulmaria*), Cuckooflower (*Cardamine pratensis*),

Yellow Flag Iris (*Iris pseudacorus*), Water forget-me-not (*Myosotis scorpioides*) and Purple Loosestrife (*Lythrum salicaria*). It might also encourage low-growing wetland grasses like Creeping Bent (*Agrostis stolonifera*) and Small Sweet-grasses (*Glyceria fluitans*), as well as marginal herbs and rushes such as Lesser Spearwort (*Ranunculus flammula*), Watercress (*Nasturtium officinale*), and Water Mint (*Mentha aquatica*), some of which already exist in the area. In addition, marginal plants like Marsh Cinquefoil (*Potentilla palustris*) and Water Dock (*Rumex hydrolapathum*), tall emergents like Branched Burweed (*Sparganium erectum*) and Bulrush (*Schoenoplectus lacustris*), floating-leaved plants such as Yellow Water-lily (*Nuphar lutea*) and Amphibious Bistort (*Persicaria amphibia*), and submerged plants like Common Water-starwort (*Callitriche stagnalis*) and Curled Pondweed (*Potamogeton crispus*) should be considered.

It is important that all planting within and around the pond aligns with ‘The Irish Pond Manual’ from An Taisce (2024). A properly constructed pond will ensure the sustainability and health of the ecosystem. Additional care should be taken to monitor the growth of species and make adjustments as necessary to support biodiversity.

6.3.3.8 Treelines and Hedgerows

- New planting scheme, including trees, to align with development plan requirements for replacement ratio to ensure no net loss of vegetation cover overall over the lifetime of the scheme. New trees to be native species only.
- Any hedges or trees planted as part of the landscape plans should be **native species only**, or species recommended in the ‘Pollinator Friendly Planting Code’. Native species such as Hawthorn, Blackthorn, Hazel, Holly, Elder, will be used to maintain structural and seasonal diversity.
- Planting will be focused along boundaries, roads, and open spaces to create continuous ecological corridors across the site.
- New and enhanced hedgerows will be planted to reconnect retained sections and reduce habitat fragmentation across the site. Hedgerow gaps will be infilled with native species planting to maintain continuous connectivity across the site and prevent fragmentation of commuting routes.
- Where possible, hedgerows and treelines will be widened over time through outward planting to

increase buffer capacity and strengthen ecological corridors across the development.

- Ensure all habitats are linked through a continuous green infrastructure network across the site (not just isolated pockets of planting). This will strengthen connections between woodland, hedgerows, treelines, and the drainage ditch and ensure that there no dead-end habitat fragments are created without linkage to surrounding features.
- Hedgerows and treelines will be managed to maintain an A-shaped profile, wider at the base and tapering towards the top, to maximise structural diversity, ecological value, and ground-level cover.
- Hedgerows and treelines will be managed through a rotational cutting regime, with cutting undertaken in phases so that different sections are cut in different years, ensuring continuous availability of cover, foraging, and nesting resources across the site at all times. No single cutting event will be applied to entire hedgerow or treeline lengths, to avoid temporary loss of habitat continuity and fragmentation of linear ecological corridors.
- A proportion of hedgerows and treelines will be left uncut on a multi-year rotation to allow flowering, fruiting, and development of mature structure beneficial to birds, bats, and invertebrates.
- Cutting will be undertaken outside the breeding bird season (1st March to 31st August inclusive).
- Placement of grass cuttings into hedgerow and treeline bases will be avoided to preserve the herbaceous layer and enhance biodiversity value at the habitat margin.
- Cut material arising from hedgerow and treeline management will be removed from site or processed appropriately and will not be left within retained habitats to avoid nutrient enrichment and habitat degradation.
- Bare branches and deadwood may be retained in other areas of the site to naturally decay and enhance habitat diversity.

6.3.3.9 Oak-Ash-Hazel Woodland

- A buffer zone will be maintained between the woodland and residential development to prevent encroachment and reduce edge effects.
- A belt (5 - 10 m) of dense native scrub (e.g. Blackthorn, Hawthorn) will be planted around the

woodland to act as a natural barrier to access and dumping within this habitat.

- This scrub layer will also provide additional habitat for species such as badgers and birds.
- No formal or informal access routes or pathways will be created within the woodland.
- Measures will be implemented to discourage dumping of garden waste or other materials within the woodland.
- The woodland will be retained and managed to maintain its ecological integrity and prevent degradation over time.

6.3.3.10 Grassland

- Grassland management will follow best practice guidance from the All-Ireland Pollinator Plan to enhance biodiversity and pollinator value across the site.
- Amenity grass areas will be reduced to a minimum, with a significant proportion of grassland managed as biodiversity-rich, species-diverse swards.
- Grass cutting will typically occur once or twice per year depending on location and function, with timing adjusted to allow flowering plants to set seed before cutting (generally late summer/early autumn).
- Cut-and-lift management will be implemented in biodiversity grassland areas, with cuttings removed following each cut to reduce soil fertility and encourage wildflower establishment.
- A rotational mowing regime will be applied across the site so that not all grassland areas are cut at the same time, maintaining continuous foraging habitat for pollinators and other fauna that use the site.
- No fertilisers, herbicides, or soil enrichment will be applied to species-rich grassland areas to maintain low nutrient conditions favourable to wildflower development.
- Rough grassland margins will be retained along treelines, hedgerows, and drainage features to provide additional habitat structure and ecological connectivity.
- Wildflower enhancement will be incorporated where appropriate using native, pollinator-friendly seed mixes consistent with All-Ireland Pollinator Plan recommendations.
- Long grass refugia patches will be retained within larger grassland areas to provide shelter and foraging continuity for invertebrates and small mammals.

6.3.3.11 Additional General Habitat Degradation, Fragmentation or Loss Measures

- This Biodiversity Management Plan will be implemented for the lifetime of the development to ensure the protection, management, and enhancement of habitats.
- Habitat loss resulting from the development will be offset through native planting and habitat creation measures across the site.
- Habitat fragmentation will be addressed through the creation and maintenance of continuous green corridors (e.g. treelines, hedgerows, and riparian vegetation).
- All new planting will consist of native species and will aim to replicate and enhance existing habitat structure and function.
- Retained and newly created habitats will be protected from degradation through appropriate site management and maintenance practices.
- Grassland areas will be managed to maintain biodiversity value, including reduced mowing frequency where appropriate.
- Grass cuttings and green waste will not be deposited within hedgerows, treelines, woodland, or drainage features to avoid nutrient enrichment and habitat degradation.
- Dumping of garden waste or other materials within natural habitats will be prohibited and managed through resident awareness.
- New planting will be monitored to ensure successful establishment, with replacement planting undertaken where necessary.
- Management practices will aim to maintain and enhance ecological connectivity across the site to support species movement and reduce fragmentation.
- Retain or create standing and fallen deadwood in woodland and boundary areas (where safe), to support invertebrates, fungi, birds, and bats.
- Include log piles and brash piles in semi-shaded areas to enhance microhabitats and shelter.
- Retain naturally fallen material within the oak-ash-hazel woodland where it does not pose a safety risk.

6.4 Water Quality

6.4.1 Construction Phase

During the construction phase, there is potential for adverse effects on water quality within drainage ditches and downstream aquatic receptors arising from site clearance, earthworks, and general construction activities. Exposed soils and ground disturbance increase the risk of sediment runoff and siltation entering drainage channels, particularly during periods of heavy rainfall. In addition, accidental pollution events may occur through leaks or spills of fuels, oils, concrete washout water, and other construction-related materials. If not properly controlled, these pollutants could degrade water quality and indirectly affect aquatic habitats, including amphibians using drainage ditches for breeding and species such as otter that may commute through connected watercourses.

6.4.1.1 Measures to Mitigate Against Water Quality Degradation in the Construction Phase

During the primary activities on-site, best practice environmental control measures will be integrated into the construction methodology. These will be detailed in a Construction Environmental Management Plan (CEMP), which will be agreed upon with the Local Authority prior to the start of works. It should be a contractual requirement for the contractor to implement Best Practice Construction and Biosecurity Methods for the site. Before development begins, the site engineer and contractors should be fully briefed on the ecological sensitivity of the site and its connection to designated areas. They must familiarise themselves with the mitigation measures outlined in this NIS, and a signed statement acknowledging these measures should be submitted to the Local Authority along with the Notice of Commencement. Site preparation and construction should adhere to best practices and comply with the relevant guidelines from Inland Fisheries Ireland for the Protection of Fisheries Habitats during Construction and Development Works and River Sites (www.fisheriesireland.ie), with particular attention to controlling silt, aggregate, and hydrocarbons. Guidelines in the CIRIA (Construction Industry Research and Information Association) publications, including C532 – Control of Water Pollution from Construction, should also be followed.

All site-specific mitigation measures should be detailed in a Construction Environmental Management

Plan. These should adhere to the relevant guidelines as follows:

- Guidelines for The Crossing of Watercourses During The Construction Of National Roads Schemes. NRA, Dublin.
- National Roads Authority (2010) The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads. NRA, Dublin.
- Inland Fisheries Ireland (2016) Guidelines on protection of fisheries during construction works in and adjacent to waters. IFI, Dublin.
- Kilfeather, P.J. (2007) Maintenance and protection of fisheries resources during road construction and improvement. Southern Regional Fisheries Board, Clonmel.
- SEPA (1996) SEPA Guidelines for Water Pollution Prevention from Civil Engineering Contracts. Scottish Environmental Protection Agency, Edinburgh.

To minimise degradation of water quality during the construction phase, the following mitigation measures should be implemented:

- The work areas must be kept to the minimum area required to carry out the proposed works and the area should be marked out and cordoned off in advance of work commencement.
- The drainage ditches on-site should be cordoned off before the commencement of the development. Vegetation along the riparian zones of the drains should be preserved.
- Any waste arising from the construction works must be disposed of to a licensed waste facility by a licensed waste haulier.
- The works area either side of drains shall be fenced with Terram or equivalent geo-textile fencing, secured to the ground to prevent the wash-out of suspended solids from the site to watercourses. Where possible, this should be set back from the riparian corridor of the watercourse to allow the retention of a buffer-zone of riparian vegetation along the watercourse.
- There must be no direct or indirect discharge of any surface water or groundwater to any water body during construction activities.
- Works must not take place in periods of heavy precipitation.

- Bare soil should be seeded as soon as possible with grass seed or native wildflower seed (local source if possible). This will minimise erosion into local drains and watercourses.
- Wet concrete is corrosive and can cause serious pollution to watercourses. Best practice in bulk-liquid concrete management must be employed addressing pouring and handling, secure shuttering, adequate curing times, etc.
- Wash water from cleaning ready-mix concrete wagons and mixers may be contaminated. Wagons and mixers must be washed off-site or in a bunded, designated area.
- Concrete batching will take place off-site.
- Cement dust must be controlled as it is alkaline and harmful to the surrounding ecology. Activities that result in the creation of cement dust should be controlled by dampening down areas.
- Raw or uncured waste concrete should be disposed of by removal from the site in a location in a manner that shall not impact any watercourse.
- All fuels, lubricants, and hydraulic fluids will be kept in secure bunded areas remotely from any watercourse. The bunded area will accommodate 110% of the total capacity of the containers within it. Containers will be properly secured to prevent unauthorised access and misuse.
- An effective spillage procedure will be put in place with all staff properly briefed.
- Any waste oils or hydraulic fluids must be collected, stored in appropriate containers, and disposed of offsite in an appropriate manner.
- Storage areas, machinery depots, and site offices will be located remotely from the watercourse.
- All refuelling and lubrication of equipment will take place on sealed and bunded surfaces to avoid the potential for accidental spillage of hydrocarbons.
- All plants and machinery will be regularly maintained and serviced to minimise the release of hydrocarbons.
- Spill kits should be present in all plant machinery.
- Oil booms and oil soakage pads will be kept on-site to deal with any accidental spillage.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling.
- The construction compound will include adequate staff welfare facilities including foul drainage.

- Foul drainage discharge from the construction compound will be tankered off-site to a licensed facility until a connection to the public foul drainage network has been established.
- Road surface re-works should be done with more permeable surface material such as asphalt and avoid the laying of impermeable surfaces such as tarmac.
- When works are close to a sensitive watercourse monitoring for suspended solids concentrations is to be carried out. This should be commenced before construction work begins in order to establish a range of background levels on these watercourses. Works may be suspended in the case of the maximum level being exceeded. If the trigger level is reached, the site should be inspected and control measures examined to ensure that the increase in suspended solids concentrations is not as a result of site works. Records of monitoring should be kept.
- Excavation and vegetation removal shall be minimised in all areas adjacent or close to watercourses. Any proposed excavation or vegetation removal shall be agreed with the project ecologist. Insofar as possible, where this is required, the project ecologist shall direct the construction of permanent bunds in order to divert or catch runoff from the

6.4.2 Operational Phase

During the operational phase, there remains a risk of water quality deterioration associated with increased surface water runoff from impermeable surfaces such as roofs, roads, and hardstanding areas. This runoff may carry hydrocarbons, sediments, and nutrients into drainage ditches and connected aquatic environments. Although Sustainable Drainage Systems (SuDS) will be implemented to manage and attenuate runoff, there is still potential for reduced treatment efficiency during high rainfall events or system exceedance, as well as risks associated with accidental spills or improper waste management. Over time, these pressures could contribute to incremental degradation of aquatic habitats, with potential indirect effects on amphibians and other water-dependent species.

6.4.2.1 Measures to Mitigate Against Water Quality Degradation in the Operational Phase

To minimise degradation of water quality during the operational phase, the following mitigation measures should be implemented:

- During operation, only clean surface water should be directed into local watercourses, via suitable soil and silt interceptors. An attenuation system to include a hydrocarbon and silt interceptor on the storm network will be implemented as outlined in the project description.
- A surface water drainage design should be carried out in accordance with SuDS methodologies and implemented as part of a treatment approach.
- Bicycle spaces on-site and walking access routes will be implemented to encourage the use of alternative transport means and reduce traffic.
- Site verges and gardens should be managed at a low-intensity level to provide maximum habitat availability for pollinators and prevent intensive pesticide run-off.
- Riparian buffer zones should be implemented along drains that run adjacent to access roads to avoid non-point source pollution. This buffer can be planted by a variety of vegetation - trees, bushes, grasses, etc. Riparian buffers reduce the momentum and magnitude of surface runoff, thereby reducing soil and sediment losses, allowing nutrient removal, and enabling uptake of nutrients in the runoff water. It is recommended that riparian buffers should be at least 2 m wide.
- As there will be a significant increase in traffic on the local third-class roads connecting to the site access road, the road running adjacent to the drains should be surveyed and proper SuDs methods implemented to avoid long-term impacts.
- Wastewater treatment systems will follow the EPA's 2021 Code of Practice for Domestic Water Treatment Systems which provides information on design operation and maintenance.
- An attenuation pond is proposed for the site to treat runoff before it passes through the interceptor and into the drainage ditch. This will allow silt and sediment to settle out prior to any discharge to the river. The pond/wetland should be regularly monitored and maintained to ensure it continues to function effectively, and a maintenance schedule should be implemented.

6.5 Waste Management

6.5.1 Construction Phase

During the construction phase, waste generation from site clearance, excavation, demolition (if applicable), and general construction activities has the potential to result in indirect ecological impacts if not appropriately managed. Poorly stored or unmanaged waste, including soil, construction materials, and general refuse, could lead to habitat degradation through encroachment into retained ecological features such as hedgerows, treelines, and drainage corridors. Stockpiled materials may also create localised smothering of vegetation and increase the risk of pollution.

6.5.2 Measures to Mitigate Against Improper Waste Management in the Construction Phase

To mitigate against improper waste management during the construction phase, the following measures should be implemented:

- All construction waste will be managed in accordance with the waste hierarchy (prevention, reuse, recycling, recovery, disposal) to minimise indirect pressures on surrounding ecological receptors.
- Waste storage areas (skips, bins, material stockpiles) will be located in previously disturbed/engineered parts of the site where possible and kept away from retained vegetation, hedgerows/treelines, water features, and ecological buffer zones to avoid indirect impacts.
- No construction waste, surplus materials, or washout liquids will be stored or disposed of within or adjacent to areas of ecological value, including boundary vegetation and drainage features.
- Excavated material will be reused on-site where suitable (e.g. for landscaping or regrading) to reduce the need for off-site disposal and associated transport impacts, limiting indirect disturbance to off-site environments (excluding material containing invasive alien species).
- All waste contractors will be licensed, and waste transfer documentation will be maintained to ensure traceability and prevent illegal dumping that could affect nearby habitats.

- Hazardous wastes (including fuels, oils, paints, and cementitious materials) will be stored in banded, sealed containers to prevent leakage into soils and subsequent contamination of groundwater or downstream aquatic ecosystems.
- Wheel washing and controlled vehicle movement measures will be implemented where necessary to prevent the transfer of soils or waste materials off-site, reducing the risk of spreading contaminants or invasive species.
- Silt, sediment, and construction debris will be controlled using appropriate containment measures (e.g. silt fences, covered skips) to prevent runoff into the drainage ditch.
- Imported soils and reused materials will be managed to avoid the introduction or spread of invasive alien plant species.

6.5.3 Operational Phase

During the operational phase, waste generation from residential and associated activities may also have indirect ecological effects if not properly managed. Inappropriate storage, containment, or disposal of household and garden waste could result in littering of green infrastructure, open spaces, and drainage features, leading to localised habitat degradation and reduced ecological quality. Waste materials may also attract scavengers or pest species, potentially altering local ecological dynamics. In addition, improper handling of garden waste could facilitate the spread of non-native or invasive plant species, particularly where material is deposited within or adjacent to hedgerows, drainage corridors, or other connected ecological features.

6.5.4 Measures to Mitigate Against Improper Waste Management in the Operational Phase

To mitigate against improper waste management during the operational phase, the following measures should be implemented:

- During the operational phase, waste will be segregated at source (general, recycling, biodegradable) to reduce the likelihood of litter that could impact local wildlife.

- Bin storage areas will be designed to be secure, covered, and regularly maintained to prevent wind-blown litter entering adjacent green spaces or ecological corridors.
- Organic waste will be encouraged to be composted or correctly managed via brown bins to reduce nutrient enrichment of landscaped or semi-natural areas, which could otherwise favour invasive or dominant species over native biodiversity.
- Household waste guidance will discourage disposal of garden cuttings, soil, or other organic material into hedgerows, treelines, the oak-ash-hazel woodland, communal green areas, or SuDS features such as the attenuation pond to prevent nutrient enrichment.
- Litter management in communal areas will be maintained to prevent ingestion or entanglement risks to fauna, particularly birds and small mammals.
- Waste collection routes and storage areas will be located away from SuDS features to avoid contamination of surface water systems.

6.6 Invasive Alien Species

6.6.1 Construction Phase

During the construction phase, there is a risk of the spread and introduction of invasive alien species through soil movement, vegetation clearance, and the use of construction machinery in proximity to existing invasive alien species recorded on-site. Disturbed ground, stockpiled soils, and temporary storage areas may provide suitable conditions for invasive species to establish if biosecurity measures are not effectively implemented. Machinery, vehicles, and imported aggregates or topsoil may also transfer invasive plant material between locations. If established, these invasive alien species could spread into retained habitats such as hedgerows, treelines, and drainage ditches, leading to the displacement of native vegetation and a reduction in habitat quality.

6.6.2 Measures to Mitigate Against Invasive Alien Species in the Construction Phase

To mitigate against the spread of invasive alien species during the construction phase, the following measures should be implemented:

- The Invasive Alien Species Management Plan will be implemented during the construction phase in accordance with best practice guidance. This will include measures to prevent the introduction and spread of IAS within or adjacent to the site, particularly during site clearance, earthworks, and material importation.
- Prior to the commencement of works, a site walkover will be undertaken to confirm the presence/absence and extent of any known IAS identified during ecological surveys if twelve months have passed since the initial survey.
- Any confirmed IAS locations will be clearly demarcated and avoided where possible.
- Toolbox talks will be provided to all site personnel to ensure awareness of IAS identification, risks, and reporting procedures, including measures to prevent accidental spread through machinery, soils, or construction materials.
- Strict biosecurity measures will be implemented during construction, including cleaning of machinery and equipment where there is a risk of transporting plant material, soil, or seed material between infected and unaffected areas.
- Excavated soils and imported fill will be managed carefully to ensure that no contaminated material containing IAS materials (seeds, rhizomes, fragments) is redistributed across the site or exported off-site without appropriate control measures.
- Any IAS encountered during construction will be managed in accordance with the site-specific IAS Management Plan and relevant guidance, with specialist treatment/removal undertaken where required.

6.6.3 Operational Phase

During the operational phase, there is a long-term risk of invasive alien species introduction and spread through landscaping activities, ornamental planting, and garden escapes. Non-native species introduced as part of private gardens or public landscaping may become established and spread into adjacent semi-natural habitats, particularly along hedgerows, treelines, oak-ash-hazel woodland and drainage ditches that provide connectivity across the site. Invasive species may outcompete native vegetation, leading to reduced structural and species diversity and a decline in overall ecological value of important habitats.

6.6.4 Measures to Mitigate Against Invasive Alien Species in the Operational Phase

To mitigate against the spread of invasive alien species during the operational phase, the following measures should be implemented:

- During the operational phase, no invasive alien species will be included in the landscape planting scheme. All planting will comprise **native species only** or species listed in the 'Pollinator Friendly Planting Code'.
- Landscaping will be designed to align with the All-Ireland Pollinator Plan and guidance available from pollinators.ie, ensuring that all selected species are pollinator-friendly, non-invasive, and appropriate to local ecology.
- A planting specification will explicitly exclude known invasive species listed under the First Schedule.
- All known IAS identified during baseline ecological surveys will be subject to ongoing monitoring on at least an **annual basis** to check for spread or re-establishment within the site boundary and adjacent habitats.
- Where IAS are identified during operational monitoring, appropriate management measures will be implemented in accordance with the IAS Management Plan, including containment or removal where necessary.
- Residents and site maintenance personnel will be informed of IAS risks and will be discouraged from introducing non-native or potentially invasive garden species into private or communal landscaped areas.
- Ongoing site management will ensure that landscaping practices do not inadvertently facilitate the establishment or spread of IAS through soil movement, inappropriate planting, or unmanaged green waste disposal.

6.7 Management and Monitoring

During the construction phase, biodiversity protection and monitoring will be overseen by a suitably qualified ecologist acting as an Ecological Clerk of Works (ECoW), appointed by the Developer. The ECoW

will undertake a pre-construction site walkover to confirm ecological conditions including habitats present, species using the site and any identified invasive alien species, and will ensure that appropriate protection measures such as fencing, buffers, and exclusion zones are in place prior to works commencing. The Principal Contractor will be responsible for day-to-day implementation of all ecological mitigation measures, with ecological awareness reinforced through toolbox talks delivered by the ECoW.

Certain higher-risk activities will require direct ecological supervision, in particular all clearance of hedgerows, treelines, scrub, or other semi-natural vegetation, which will be undertaken under the supervision of the ECoW to avoid impacts on nesting birds and badgers and to ensure protection of retained ecological features. Works in proximity to drainage ditches and other aquatic habitats will also be subject to ecological oversight where there is potential for impacts on amphibians, otter commuting routes, or water quality. The ECoW will also supervise or inspect key stages of earthworks, soil stripping, and drainage/SuDS installation where there is an increased risk of disturbance to habitats, pollution, or the spread of invasive alien species.

The ECoW will carry out periodic site inspections on a risk-based frequency, with more regular visits during initial clearance and early construction phases and reduced frequency during lower-risk stages, supplemented by additional site visits as required where ecological risks arise. The ECoW will have authority to stop works if ecological risks are identified or if mitigation measures are not being properly implemented. This approach ensures effective ecological oversight during construction, with targeted supervision of sensitive activities and ongoing compliance monitoring across the site.

During the operational phase, responsibility for biodiversity management will transfer to the Site Management Company, appointed by the Developer, with periodic input from a suitably qualified ecologist. Post-construction ecological monitoring will be undertaken at Years 1, 3, and 5 to assess habitat establishment, the condition of green infrastructure and SuDS features, and the effectiveness of ecological mitigation and enhancement measures. Annual monitoring of any identified invasive alien species will also be undertaken, with control measures implemented where necessary in accordance with the site-specific management plan. The Site Management Company will also be responsible for ongoing maintenance of landscaping, SuDS features, lighting controls, and green infrastructure to ensure

continued protection of ecological corridors and habitats, with ecological advice provided as required.

Table 1. Actions required during the construction and operational phase, responsibilities and timing/frequency

Action/Measure	Responsibility	Timing/Frequency
Construction Phase		
Pre-construction ecological walkover to confirm constraints/baseline (hedgerows, treelines, ditches, IAS) and set up buffers/exclusion zones.	ECoW	Prior to any site works.
Toolbox talks on ecology (protected species, IAS, pollution prevention).	ECoW (delivery) / Principal Contractor and Site Operatives (attendance)	Prior to commencement and repeated as needed.
Installation and maintenance of ecological protection measures (fencing, buffers, signage).	Principal Contractor (installation) / ECoW (supervision/verification)	Prior to and during construction.
Supervision of hedgerow, treeline and scrub clearance.	ECoW	During all vegetation clearance activities.
Ecological supervision of works near drainage ditches (amphibians, otter commuting routes, water quality risk)	ECoW	As required during relevant works.
Ecological oversight of earthworks, soil stripping, and SuDS/drainage installation	ECoW	During key construction phases.

Pollution prevention checks (fuel storage, concrete washout, sediment control)	ECoW	Ongoing, with regular inspections.
Monitoring for invasive alien species spread and biosecurity compliance.	ECoW	During site inspections throughout construction.
Routine ecological site inspections	ECoW	Weekly/monthly depending on construction phase risk.
Emergency ecological response (e.g. protected species discovery, pollution event)	ECoW (advice/stop works authority) / Principal Contractor (action)	As required.
Waste management compliance relevant to biodiversity (containment, no encroachment into habitats)	Principal Contractor	Ongoing.
Implementation of enhancement and protection measures outlined in this Biodiversity Management Plan.	Principal Contractor (action), ECoW (verification)	All construction-phase measures, along with the implementation of habitat enhancement and creation measures for the operational phase outlined above, must be completed prior to the end of the construction phase.
Operational Phase		

Implementation of mitigation, enhancement and protection measures outlined in this Biodiversity Management Plan.	Site Management Company	Ongoing post-construction.
Post-construction ecological monitoring to assess habitat establishment, the condition of green infrastructure, SuDS features, and the effectiveness of ecological mitigation and enhancement measures.	Site Management Company, ECoW	Year 1, 3 and 5 post-construction.
Post-construction monitoring of invasive alien species.	Site Management Company, ECoW	Annually.
Ongoing maintenance and management of landscaping, SuDS features, lighting, and green infrastructure to ensure continued protection of ecological corridors and habitats.	Site Management Company, ECoW (advice as required)	For the duration of the operational phase of this development.

Conclusion

conclusion to be completed upon confirmation of measures with client.

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