DixonBrosnan
environmental consultants

Ecological Impact Assessment (EcIA)

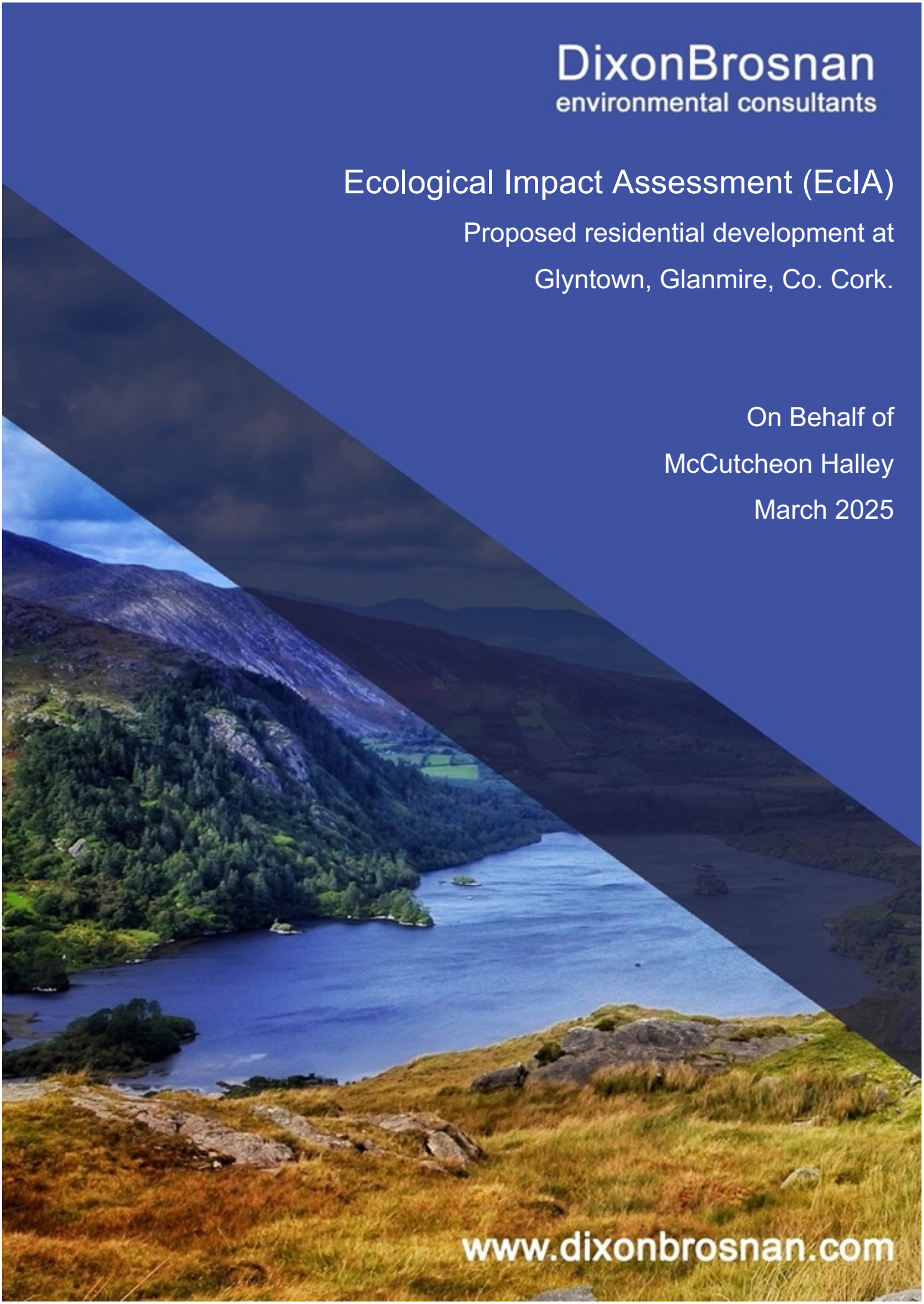
Proposed residential development at

Glyntown, Glanmire, Co. Cork.

On Behalf of

McCutcheon Halley

March 2025



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Project	Ecological Impact Assessment (EcIA) Proposed residential development at Glyntown, Glanmire, Co. Cork.	
Client	McCutcheon Halley	
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08/07/22	1st draft	Sorcha Sheehy BSc PhD
19/07/22	Issue to client (1)	Carl Dixon BSc MSc
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1. Introduction

DixonBrosnan Environmental Consultants were commissioned to assess the potential impacts from a proposed residential development and all associated site works at Glyntown, Glanmire, Co. Cork, on terrestrial and aquatic flora and fauna. This report describes and evaluates the habitats with their representative flora and fauna and addresses the potential impacts of the development on the ecology of the site and the surrounding area.

2. Methodology

2.1 Introduction

This appraisal is based on surveys of the proposed works area and a review of desktop data. Although not part of an environmental impact assessment report (EIAR) this report follows the structure and protocols detailed in *Advice notes for preparing Environmental Impact Statements* (EPA Draft, 2015) and *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'* (EPA 2022).

2.2 Desktop Review

A desktop study was carried out identify features of ecological value occurring within the proposed development site and those occurring in close proximity to it. A desktop review also allows the key ecological issues to be identified early in the appraisal process and facilitates the planning of surveys. Sources of information utilised for this report include the following:

- National Parks & Wildlife Service (NPWS) - www.npws.ie
- Environmental Protection Agency (EPA) – www.epa.ie
- National Biodiversity Data Centre (NBDC) – www.biodiversityireland.ie
- Cork City Biodiversity Action Plan 2009-2014;
- *Cork City Development plan 2022-2028*
- Bat Conservation Ireland – http://www.batconservationireland.org
- Birdwatch Ireland - http://www.birdwatchireland.ie/
- British Trust for Ornithology (BTO)-www.BTO.org
- Invasive Species Ireland - http://www.invasivespeciesireland.com/
- *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011)
- *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (National Roads Authority, 2009)
- *Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)* European Union, 2017 and

- Cork City D0033-01 Wastewater Treatment Plant (WWTP) Annual Environmental Report 2022 (Irish Water 2023).

The appraisal of impacts follows the protocols outlined in guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority, 2009) and CIEEM (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition*.

2.2.1 Relevant Legislation

Flora and fauna in Ireland are protected at a national level by the Wildlife Acts, 1976 to 2000 and the European Communities (Birds and Natural Habitats) Regulations 2011. They are also protected at a European level by the EU Habitats Directive (92/43/EEC) and the EU Birds Directive (79/409/EEC) amended in 2009 as the Directive 2009/147/EC.

Under this legislation, sites of nature conservation importance are then designated in order to legally protect faunal and floral species and important/vulnerable habitats.

The categories of designation are as follows:

- Special Areas of Conservation (SAC) are designated under the European Communities (Birds and Natural Habitats) Regulations 2011 to comply with the EU Habitats Directive (92/43/EEC);
- Special Protection Areas (SPAs) and designated under the EU Birds Directive (79/409/EEC) amended in 2009 as the Directive 2009/147/EC; and
- Proposed Natural Heritage Areas (pNHA) are listed under the Wildlife (Amendment) Act, 2000. They have limited legal protection under Local Authority Development Plans.

2.3 Survey Overview

Site visits were carried out 21st and the 30th of June 2022. Following a minor amendment to the proposed development site boundary, an additional site visit was carried out on the 9th of September 2024. The following surveys were carried out at the site:

- Habitats were mapped according to the classification scheme outlined in the Heritage Council publication '*A Guide to Habitats in Ireland (Fossitt, 2000)'* and following the guidelines contained in '*Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011)'.*
- The proposed development area was surveyed for invasive species.
- All bird species recorded during the walkover survey and habitat survey were recorded.
- A general mammal survey was carried out in conjunction with the habitat survey.
- A bat emergence survey was carried out at the site buildings and along boundary habitats

This report was prepared by Carl Dixon MSc (Ecological Monitoring), Sorcha Sheehy PhD (Ecology/ornithology).

Carl Dixon MSc (Ecology) is a senior ecologist who has over 20 years' experience in ecological and water quality assessments with particular expertise in freshwater ecology. He also has experience in mammal surveys, invasive species surveys and ecological supervision of large-

scale projects. Projects in recent years include the Waste to Energy Facility Ringaskiddy, Shannon LNG Project, supervision of the Fermoy Flood Relief Scheme, Skibbereen Flood Relief Scheme, Upgrade of Mallow WWTP Scheme, Douglas Flood Relief Scheme, Great Island Gas Pipeline etc.

Sorcha Sheehy PhD (ecology/ornithology) is an experienced ecological consultant with over ten years' experience. She has worked on Screening/NIS's for a range of small and large-scale projects with particular expertise in assessing impacts on birds. Recent projects include bird risk assessments for Dublin and Cork Airports, Waste to Energy Facility Ringaskiddy and Water Storage Schemes for Irish Water.

3. Receiving Environment

3.1 Site Location

The site is located on the outskirts of Cork City and near the village of Glanmire. The site is accessed from the East Cliff Road in Glyntown, Glanmire. To the north of the site a band of mixed woodland has developed on steep ground running down to the Glashaboy River. To the east and southeast there is a large residential estate. A review of aerial photography indicates that much of the western section of the site was previously cleared of vegetation. The site location is shown in **Figure 1**.

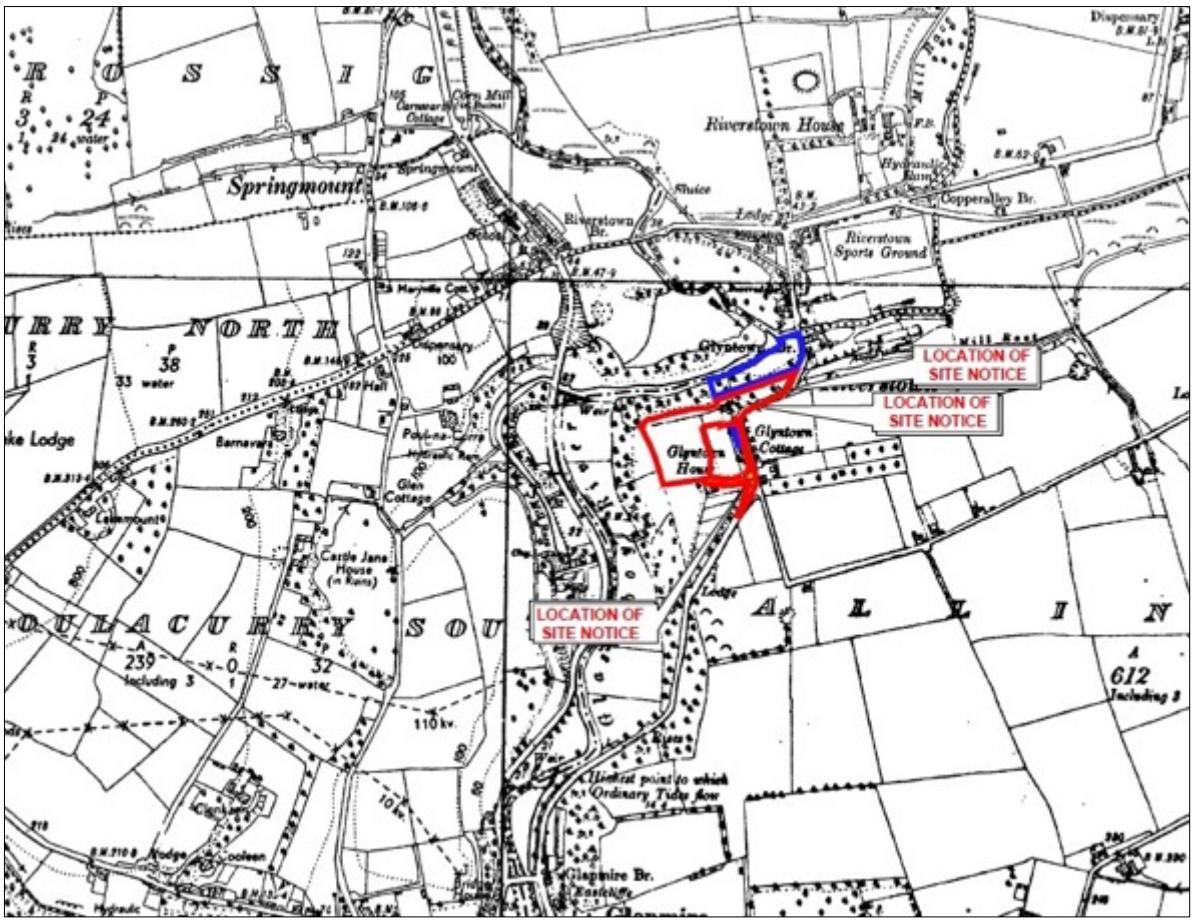

Figure 1. Site location | Source OSI.ie Red denotes development area, blue denotes landownership

3.2 Proposed development

The proposed development is summarized below. An overview is provided in **Figure 2**.

- The construction of residential development of 80 no dwelling units. Of these there are: 30 no. duplexes, 48 no. apartments within 2 apartments blocks and 2 no. apartments within the coach house.
- The conversion of an existing coach house building.
- Ancillary site works including a vehicular entrance and a pedestrian entrance from the East Cliff Road
- Associated secure bicycle parking and bin storage.
- Vehicular access to the proposed development will be via the existing access from the L-2998 public road although it is proposed to alter the entrance in order for it to be perpendicular to the public road.
- The development will also propose to include a pedestrian amenity walkway around the southwest and western boundary of the site. It is proposed to maintain the existing forestry boundary and supplement it with a 2.0m high weld mesh fence where necessary.

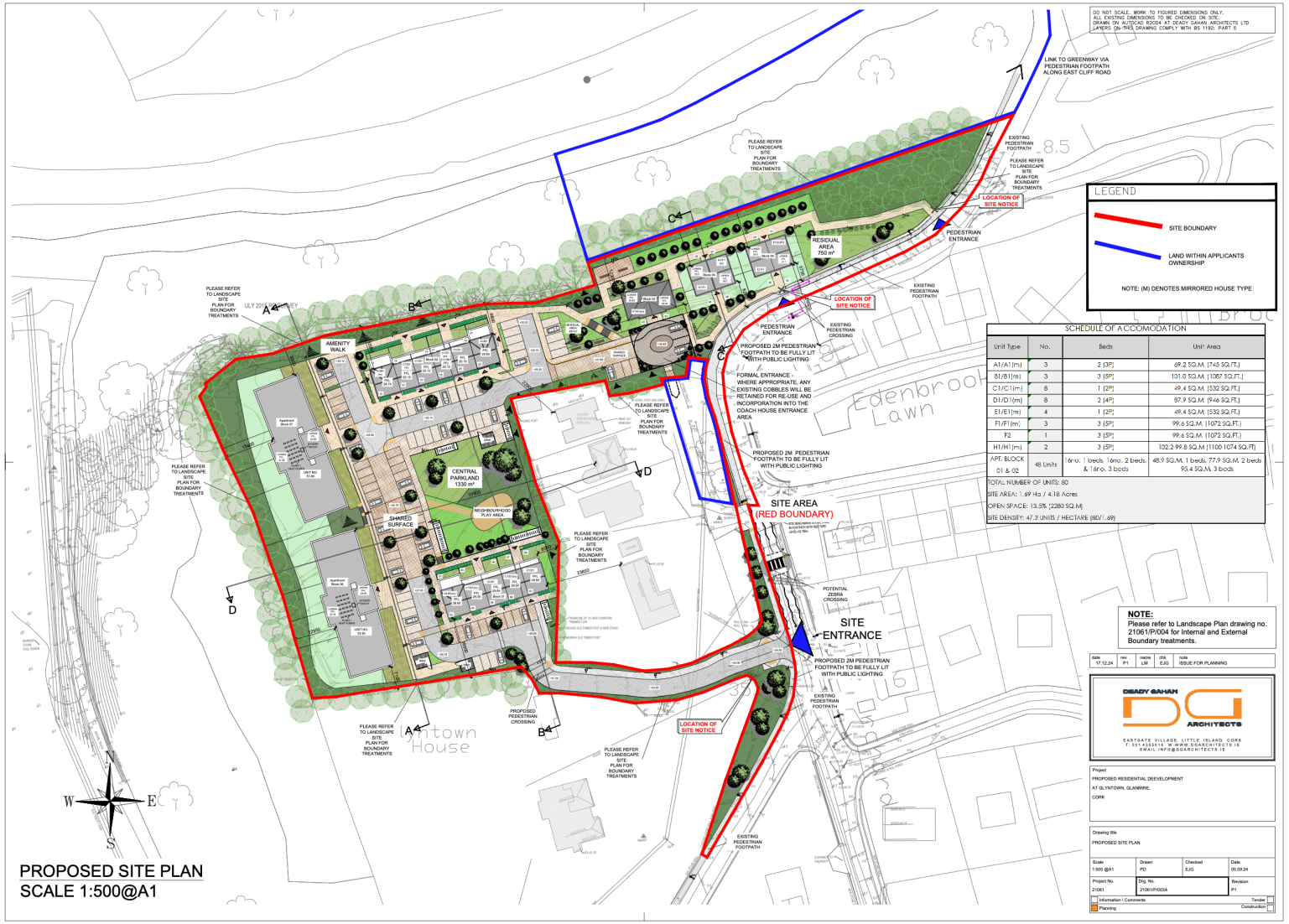

Figure 2. Overview of proposed development site Source DG Architects

3.2.1 Surface Water Management

As was agreed with the engineering section of Cork County Council, the storm water system for the development will involve a network of underground pipelines and manholes discharging to the storm sewer at the junction of East Cliff Road and Brookville Estate via an attenuation system, which will be fitted with flow control devices to ensure no increase in peak flows and an oil interceptor to remove any traces of oil washed off road surfaces.

Surface water discharge rates from the proposed surface water drainage network will be controlled by a vortex flow control device (Hydrobrake or equivalent) and associated attenuation tank. Surface water discharge will also pass via a bypass fuel/oil separator (sized in accordance with permitted discharge from the site).

The proposed surface water drainage network will collect surface water runoff from the site via a piped network prior to discharging off site via the attenuation tank, flow control device and separator arrangement as noted above.

SuDS Appraisal

Stormwater attenuation and treatment measures utilising Sustainable Drainage Systems (SuDS) in addition to attenuation tanks and hydrocarbon interceptors, shall be incorporated into the proposed storm water system.

The SUDS selection process used for this site is in accordance with SUDS selection flow chart. The characteristics of the site are utilised to select the various SUDS techniques that would be applicable.

The applicant has considered the use of all appropriate SUDS devices as part of the site SUDS strategy.

- Underground Attenuation -below the open space area
- Flow control device (e.g. hydrobrake) - installed at the outfall manhole of each catchment
- Petrol Interceptor - installed downstream of each flow control device manhole.

The effectiveness of each SUDS / drainage mechanism proposed is outlined below.

Tree Pits

It is also proposed, where possible to fit tree pits along the entrance road to drain and treat surface water runoff from the road network. This will allow for treatment of first flush and low flows., and high flows will discharge into the surface water network during extreme rainfall events. Rainwater gullies will still be provided downstream of any tree pit to drain runoff during an extreme rainfall event.

Underground Attenuation

The system attenuates surface water to restrict the outflow to the equivalent of an agricultural runoff. This ensures the development will not give rise to any impact downstream of the site.

Flow Control Device

It is proposed to provide a hydrobrake, or similar approved, at the outfall of the surface water catchment to restrict the outflow of water from the subject site. The hydro-brakes will be fitted with a pull cord bypass and a penstock valve installed on the inlet to the manhole for maintenance purposes.

Petrol Interceptor

It is proposed to provide a petrol interceptor upstream of both attenuation tanks to ensure that any remaining hydro-carbons or pollutants within the runoff from trafficked areas are treated prior to outfall to the existing combined sewer. It is proposed to provide a Conder Bypass Separator Type or similar approved.

In conclusion the water quality from this catchment should be of a high quality due to the above-mentioned measures, which are applied in a treatment train to treat the water before discharge at a restricted rate to the local network. The above measures ensure a suitable management train is provided.

Management Train

The management train commences with the introduction of the hydrocarbon interceptors, site control, which provide a degree of treatment before discharging to the attenuation system. The second stage of the management train, regional control, is provided by the underground attenuation, by slowing the storm water discharge down, promoting infiltration and removing additional silts which may remain in the storm water.

Surface Water Drainage Network

The surface water drainage network for the proposed development was modelled using the Microdrainage software application. The surface water pipe lengths, slopes, contributing impermeable areas, upstream invert levels, upstream cover levels and pipe diameters were entered into the model using the drawings supplied.

Volume of Attenuation Tank

The capacity of the attenuation tank is designed to cater for the capacity required for a 1 in 100 year ARI event.

Silt Control and Hydrocarbon Interceptor

A petrol interceptor is a trap used to filter out hydrocarbon pollutants from rainwater runoff. It is used in construction to prevent fuel contamination of streams carrying away the runoff. For the Catchment Area A, the hard-surfaced area that will be draining to the interceptor between SW.012 & SW.011 is approximately 4,060m². A Conder CNSB10s/21 interceptor with a catchment capacity of 5,560m² will be provided. For the Catchment Area B, the hard-surfaced area that will be draining to the interceptor between SW.005 & SW.004 is approximately 4,200m². A Conder CNSB10s/21 interceptor with a catchment capacity of 5,560m² will be provided. The proposed petrol interceptors from Conder Environmental also include a silt storage capacity in addition to the oil storage capacity that allow silt to be collected in the interceptor prior to discharge to the proposed attenuation tanks. This silt build-up can then be removed from the tanks.

3.2.2 Foul Water

A Pre-Connection Enquiry was submitted to Irish Water. The Irish Water Reference Number for this enquiry is CDS21004747. The response to this Enquiry issued on the 28th September 2021 confirmed that connection to the network was feasible without any infrastructure upgrade. There are Irish Water pipes within and in close proximity of the site boundaries

80 No. Units

Section 3.6 of The Irish Water Code of Practice Wastewater Infrastructure states that for the gravity sewers shall be designed to carry a minimum wastewater volume of 6 times the dry weather flow (6DWF) which is to be taken as 450 litres per dwelling

- Loading = (80) (450) / (24) (60) (60) = 0.417 litres/second
- 6DWF = 2.5 litres/second

The layout of the proposed foul sewer network is shown on the Proposed Stormwater & Foul Sewer Layout Plan 6291-5020 & 5021.

The overall quantity of wastewater for the proposed development is estimated at 216m³ per day.

This is based on the unit schedule submitted by the architect. The foul waste within the development will be collected via an internal gravity network and will discharge to the existing public foul sewer on Main Street.

All works will be in accordance with Irish Water specifications and requirements.

All works will be in accordance with Irish Water Code of Practice for Wastewater Supply & the Wastewater Infrastructure Standard Details Document Number: IW-CDS-5030-01.

4. Designated Conservation Areas

4.1 European (Natura 2000) Sites

Special Areas of Conservation (SACs) and candidate SACs are protected under the Habitats Directive 92/43/EEC and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Special Protection Areas (SPAs) are protected under the Birds Directive 2009/147/EC and European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Collectively, these sites are referred to as Natura 2000 or European sites.

The proposed development site does not form part of any Special Protection Area (SPA) or Special Area of Conservation (SAC). The proposed development site is located within the zone of influence of three designated sites i.e. Great Island Channel SAC, Blackwater River (Cork/Waterford) SAC and Cork Harbour SPA (**Table 1**). Relevant Natura 2000 sites are shown in **Figure 3**.

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay, Ringabella Creek and the Rostellan and Poulnabibe inlets. Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its populations of Black-tailed Godwit and Redshank. In addition, it supports nationally important wintering populations of 22 species, as

well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive.

The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and, compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owennacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel. The site is a Special Area of Conservation (SAC) for two habitats listed on Annex I; [1140] Tidal Mudflats and Sandflats [1330] Atlantic Salt Meadows.

The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. The portions of the Blackwater and its tributaries that fall within this SAC flow through the counties of Kerry, Cork, Limerick, Tipperary and Waterford. Nearby towns include Rathmore, Millstreet, Kanturk, Banteer, Mallow, Buttevant, Doneraile, Castletownroche, Fermoy, Ballyduff, Rathcormac, Tallow, Lismore, Cappoquin and Youghal. Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively.

Table 1. Designated sites and their location relative to the proposed development site

Natura 2000 Sites	Site Code	Distance at closest point and potential source-pathway-receptor link
Special Area of Conservation (SAC)		
Great Island Channel SAC	001058	3.7km
Blackwater River (Cork/Waterford) SAC	002170	12.1 km
Special Protection Area (SPA)		
Cork Harbour SPA	004030	1.0km
Natural Heritage Areas (NHA) or proposed Natural Heritage Areas (pNHA)		
Glanmire Wood pNHA	001054	905m
Dunkettle Shore pNHA	001082	1.7km
Douglas River Estuary pNHA	001046	2.65km
Great Island Channel pNHA	001058	3.4km
Rockfarm Quarry Little Island pNHA	001074	4.3km

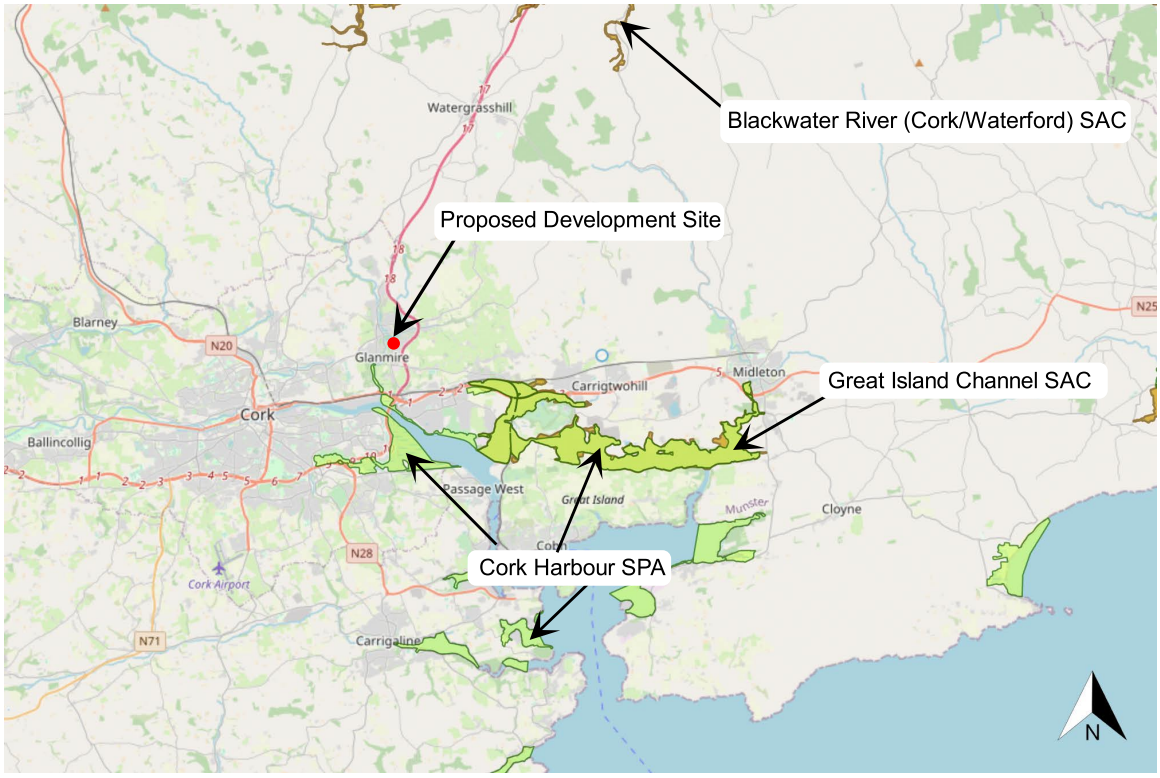

Figure 3. Location of the proposed development boundary and Natura 2000 sites located within zone of influence of the site | Source: EPA Envision mapping https://gis.epa.ie/EPAMaps/) | Not to scale

4.2 Nationally Protected Sites

Natural Heritage Areas (NHAs/pNHAs) are national designations under the Wildlife Act 1976, as amended. A Natural Heritage Area (NHA) is designated for its wildlife value and receives statutory protection. A list of proposed NHAs (pNHAs) was published on a non-statutory basis in 1995, but these have not since been statutorily proposed or designated. NHAs and pNHAs in the vicinity of the proposed development site are listed in **Table 1** and illustrated in **Figure 4**. There are no NHAs or pNHAs overlapping with or adjacent to the proposed development site.

The closest pNHAs are the Glanmire Woods pNHA (1.3km southwest) and the Dunkettle Shores pNHA (2.0km southwest). Glanmire Wood pNHA occurs on the east bank of the Glashaboy River, immediately south of Glanmire village. The main habitat of interest is mixed broad-leaved woodlands dominated by oak (*Quercus* sp.), beech (*Fagus sylvatica*) and sycamore (*Acer pseudoplatanus*) with a few conifers. This site is of interest because this type of woodland is rare in east Cork. There is no pathway for impact from the proposed development to the woodland conservation interests of the Glanmire Wood pNHA.

Dunkettle Shores pNHA is located at the mouth of Glashaboy River, where it meets the Lee estuary, on the eastern edge of Cork city. It is adjacent to Glanmire Wood and is an integral part of Cork harbour. The site is of value because its mudflats provide an important feeding ground for waterfowl and it acts as a significant roost for birds in the upper harbour. Furthermore, it is an integral part of Cork harbour which is an internationally important wetland, regularly holding flocks of over 20,000 waterfowl. The Dunkettle shores pNHA is potentially hydrologically connected to the proposed development site via the Glashaboy River.

A number of pNHAs form part of the Cork Harbour complex including the Douglas River Estuary pNHA which is located 3.0km southwest of the proposed development site. There is a potential hydrological connection between the proposed development site and Cork Harbour via surface water runoff during the construction and operational phase.

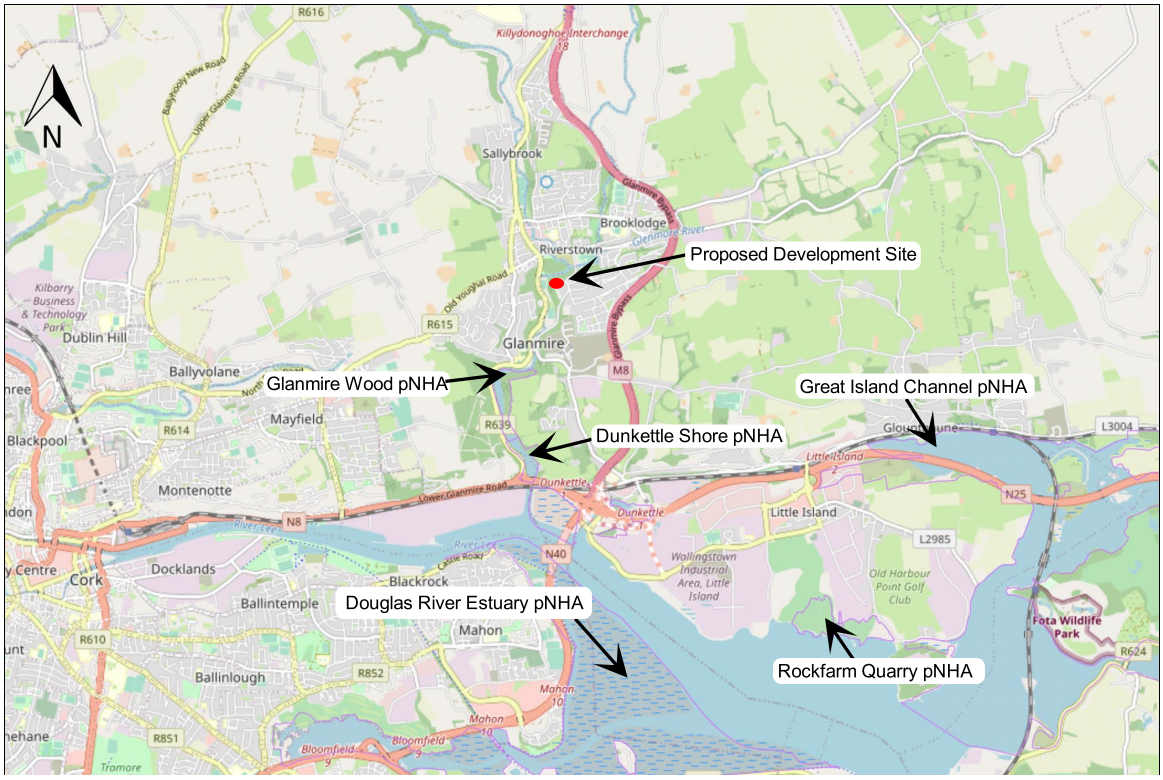

Figure 4. Proposed Natural Heritage Areas (pNHAs) in the vicinity of the proposed development site | Source: EPA Envision mapping https://gis.epa.ie/EPAMaps/) | Not to scale

4.3 Ramsar Sites

The Convention on Wetlands, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. A key commitment of Ramsar Contracting Parties is to identify and place suitable wetlands onto the List of Wetlands of International Importance. Cork Harbour is listed as a Ramsar site, which is a non-statutory designation.

4.4 Important Bird Areas – Cork Harbour

Important Bird and Biodiversity Areas (IBAs) are sites selected as important for bird conservation because they regularly hold significant populations of one or more globally or regionally threatened, endemic or congregator bird species or highly representative bird assemblages. The European IBA programme aims to identify, monitor and protect key sites for birds all over the continent. It aims to ensure that the conservation value of IBAs in Europe (now numbering more than 5,000 sites or about 40% of all IBAs identified globally to date) is maintained, and where possible enhanced. The programme aims to guide the implementation of national conservation strategies, through the promotion and development of national

protected-area programmes. Through their designation they aim to form a network of sites ensuring that migratory species find suitable breeding, stop-over and wintering places along their respective flyways.

The function of the Important Bird Area (IBA) Programme is to identify, protect and manage a network of sites that are important for the long-term viability of naturally occurring bird populations, across the geographical range of those bird species for which a site-based approach is appropriate. The proposed development site has a potential hydrological connection via the Glashaboy River to the Cork Harbour IBA (Site Code: IE088).

The site qualifies for designation under the following IBA Criteria (2000):

- A4iii - The site is known or thought to hold, on a regular basis, ≥ 20,000 waterbirds or ≥ 10,000 pairs of seabird of one or more species.
- B1i - The site is known or thought to hold ≥ 1% of a flyway or other distinct population of a waterbird species
- B2 - The site is one of the most important in the country for a species with an unfavourable conservation status in Europe and for which the site-protection approach is thought to be appropriate.
- C3 - The site is known to regularly hold at least 1% of a flyway population or of the EU population of a species threatened at the EU level (not listed on Annex 1 of The Birds Directive).
- C4 - The site is known to regularly hold at least 20,000 migratory waterbirds and/or 10,000 pairs of migratory species of one or more species.
- C6 - The site is one of the five most important in the European region in question for a species or subspecies considered threatened in the European Union.

Table 2. Provides a summary of the Cork Harbour IBA trigger species.

Species	Current IUCN Red List Category	Season	Year(s) of estimate	Population estimate	IBA Criteria Triggered
Eurasian Curlew (*Numenius arquata*)	NT	winter	1995	1,669 individuals	B2
Bar-tailed Godwit (*Limosa lapponica*)	NT	winter	1996	456 individuals	B2
Black-tailed Godwit (*Limosa limosa*)	NT	winter	1996	1,399 individuals	B1i, C3
Dunlin (*Calidris alpine*)	LC	winter	1995	12,050 individuals	B1i, B2, C3
Common Redshank (*Tringa tetanus*)	LC	winter	1996	1,344 individuals	B1i, C3
Common Tern (*Sterna hirundo*)	LC	breeding	1995	102 breeding pairs	C6
A4iii Species group - waterbirds	n/a	winter	-	20,000 individuals	A4iii, C4

5. Habitats

Site surveys were carried out on the 21st and the 30th of June 2022. Habitat mapping was carried out in line with the methodology outlined in the Heritage Council Publication, *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011). The terrestrial and aquatic habitats within or adjacent to the proposed development site was classified using the classification scheme outlined in the Heritage council publication *A Guide to Habitats in Ireland* (Fossitt, 2000) and cross referenced with Annex I Habitats where required.

The ecological value of habitats has been defined using the classification scheme outlined in the *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (National Roads Authority (NRA) 2009) which is included in **Appendix 1**. It should be noted that the value of a habitat is site specific and will be partially related to the amount of that habitat in the surrounding landscape. Habitats that are considered to be good examples of Annex I and Priority habitats are classed as being of International or National Importance. Semi-natural habitats with high biodiversity in a county context and that are vulnerable, are considered to be of County Importance. Habitats that are semi-natural, or locally important for wildlife, are considered to be of Local Importance (higher value) and sites containing small areas of semi-natural habitat or maintain connectivity between habitats are considered to be of Local Importance (lower value).

A current overview of habitats recorded within the site is shown in **Figure 5** and the habitats recorded on site are described in **Table 3**. Site photographs are included below**.** No Annex I habitats were recorded within the proposed development site. No protected species were recorded during the site visits.

It is noted that an additional site visit was carried out the 9th of September 2024 to review a small area along the East Cliff Road which has recently been included in the proposed development site boundary (as per **Figure 2**). This new area includes a small section of non-native/native treeline (WL2), Amenity grassland GA2 and Stonewalls and other stonework BL1.

Table 3. Habitat present within proposed development site and their relative value

Habitat	Comments	Habitat value (NRA guidelines)
Dry meadow and grassy verge GS2/Scrub WS1	The area in proximity to the existing coach house has not been actively managed and now consists of a mixture of dry meadow and grassy verge and invading scrub. Species noted include False Oat Grass, Yorkshire Fog, Cocksfoot, Curled Dock, Hogweed, Field Thistle, Wild Clematis, Meadow Vetchling, Purple Loosestrife, Red Clover and Hedge Woundwort. A consolidated area of ground at the front of the coach house which is less fertile supports Oxeye Daisy, Common Knapweed, Germander Speedwell and Ripwort Plantain. Scrub includes dense stands of Bramble with Willow also noted. Ash saplings were also recordeed. The invasive species Winter Heliotrope has a scattered distribution.	Local value (Lower importance)

Habitat	Comments	Habitat value (NRA guidelines)
	Dry meadows and grassy verges GS2 corresponds to the Habitats Directive Annex 1 habitat: 'lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) (6510). However, this mosaic of grassland within the proposed development area is common and does not represent a valuable example of this Annex I habitat type.	
Recolonising bare ground ED3/Dry meadow and grassy verge GS2/ Scrub WS1	A review of arial photography indicates that much of the western section of the site was previously cleared of vegetation. It has now been colonised by a mosaic of habitats with scrub becoming dominant. Willow (Pussy Willow, Goat Willow and occasional Crack Willow) is very common and forms dense thickets. Birch (Silver and Downy) also common. Other scrub species include Bramble and Wild Rose, Gorse, Elm and Hawthorn. Buddleia is occasional. Some Pedunculate Oak and Ash saplings have become established and in the absence of active management this area would develop from a dominance by willow/birch scrub to woodland habitat. Within more consolidated and less fertile areas, such as tracks which have not become dominated by scrub, there is a mixture of recolonising bare ground and grassland. Species noted include Yorkshire Fog, Self Heal, Oxeye Daisy, Meadow Vetchling, Birds Foot Trefoil, Centuary, Rosebay Willow Herb, Common Figwort and Cats ear, Primrose and Creeping Jenny. Dry meadows and grassy verges GS2 corresponds to the Habitats Directive Annex 1 habitat: 'lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) (6510). However, this mosaic of grassland within the proposed development area is common and does not represent a valuable example of this Annex I habitat type.	Local value (Higher importance)
Buildings and artificial surfaces BL3	An old coach house structure is located in the eastern section of the site. It is in good condition overall with an intact roof. Most of the windows are boarded up. It supports a small number of Pipistrelle Bats (See **Section 7.2.1**). Sections of modern block wall in the eastern section of the site are of negligible ecological value.	Local value (Higher importance)
Stone Walls and Other Stonework BL1	An old stonewall forms the road boundary in the eastern section of the site. It supports some more specialised species including Polypody, Ivy, Wild Rose and Male Fern.	Local value (Lower importance)
Mixed broadleaved woodland WS1	Adjoining the development boundary to the north and west is an area of mixed broadleaved woodland. It occupies land which slopes steeply to the Glashaboy River and will not be directly affected by the proposed development. Beech and Sycamore are the most common species and there are some mature conifers, particularly along woodland boundaries. Bramble forms dense thickets in the	Local value (Higher importance

Habitat	Comments	Habitat value (NRA guidelines)
	understorey and Elm, Holly and Hazel are occasional. Other species noted include Soft Shield Fern, Wood Avens, Pignut, Lord and Ladies and Wood Dock	
Amenity grassland GA2	There are some small areas of managed amenity grassland adjacent to the proposed entrance.	Local value (Lower importance)

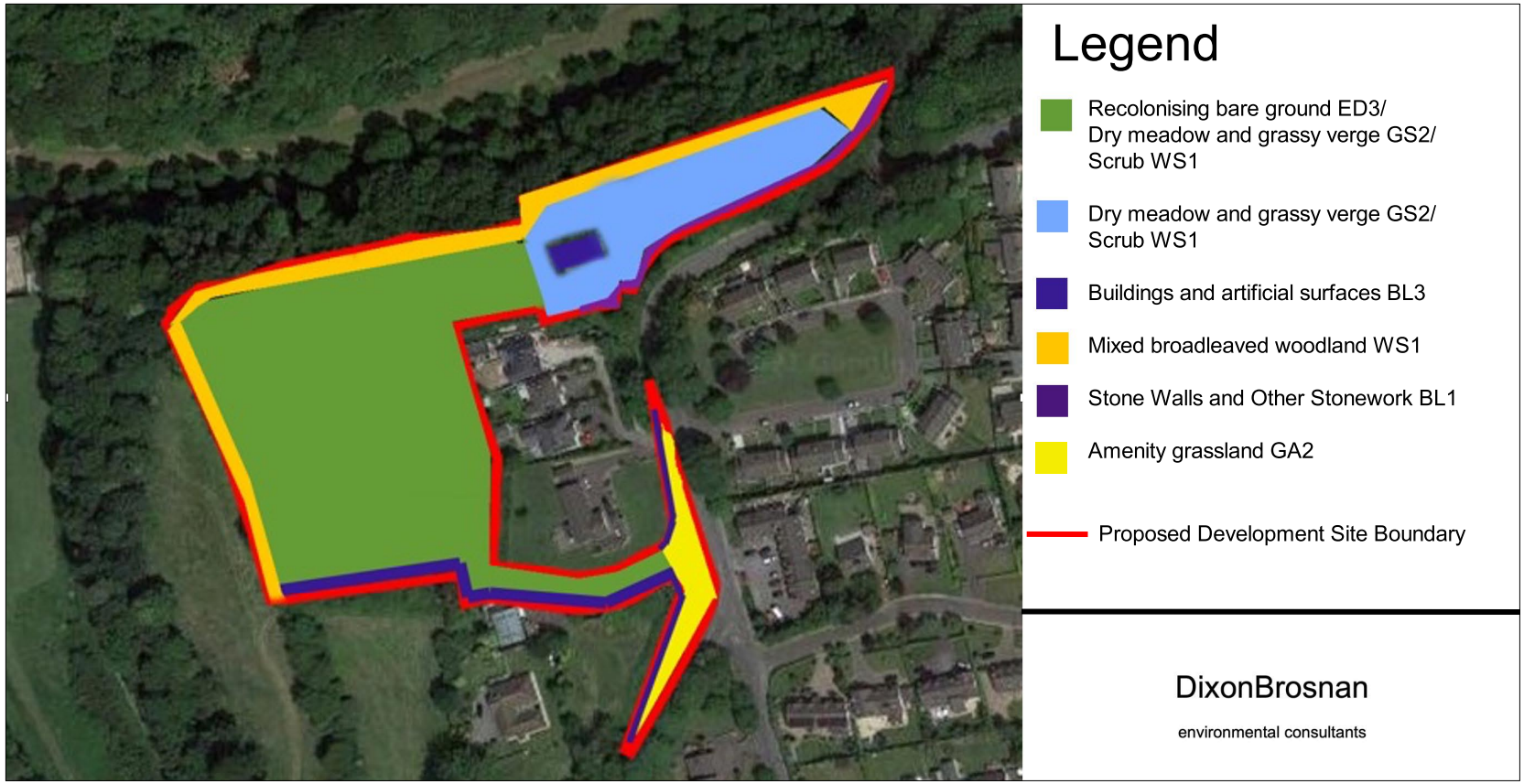

Figure 5 Habitat Map.

Photograph 1: Dense scrub in western section of the site

Photograph 2. Coach house with dry meadow and grassy verge

Photograph 3. Mixed woodland on steeply sloping ground between the proposed development site and Glashaboy River.

Photograph 4. Amenity grassland and modern wall of low ecological value.

Photograph 5. Treeline included within updated red line boundary

Photograph 6. Stonewall included within updated red line boundary

6. Flora

The site of the development lies within Ordnance Survey National Grid 10km square W77. The National Parks and Wildlife Service (NPWS) rare plant database lists two protected plant species within W77 i.e., Meadow Barley (*Hordeum secalinum*), Chives (*Allium schoenoprasum*). These species are protected by the Flora Protection Order 2015 (S.I. No. 356 of 2015). Little Robin, an endangered plant species has also been recorded within W77. However, no rare, threatened or legally protected plant species, as listed in the Irish Red Data Book (Wyse Jackson *et al* 2016; Stace 2019) were recorded within the proposed development site. **Table 4** lists threatened species, designations and 10km grid square. No rare species were recorded during the site survey, nor are they expected to occur given that the habitats within the study area are relatively common.

The National Biodiversity Data Centre (NBDC) online database provides data on the distribution of mammals, birds, and invertebrates within the 10km grid squares. Some 389 flowering plants are listed by the NBDC as present in the grid square W77.

Table 4. NBDC listed flowering and endangered flowering plants for grid square W77

Grid Square	Flowering plant Species	Latin Name	Designations/Threatened Status
W77	Chives	*Allium schoenoprasum*	Flora Protection Order & Vulnerable
W77	Little-robin	*Geranium purpureum*	Endangered
W77	Meadow Barley	*Hordeum secalinum*	Flora Protection Order & Endangered

Source NBDC database

7. Fauna

7.1 Otter

Otters *Lutra lutra*, along with their breeding and resting places are protected under the provisions of the Wildlife Act 1976, as amended by the Wildlife (Amendment) Act, 2000. Otters have additional protection because of their inclusion in Annex II and Annex IV of the Habitats Direct which is transposed into Irish law in the European Communities (Natural Habitats) Regulations (S.I 94 of 1997), as amended. Otters are also listed as requiring strict protection

in Appendix II of the Berne Convention on the Conservation of European Wildlife and Natural Habitats and are included in the Convention on International Trade of Endangered species (CITES).

Although rare in parts of Europe they are widely distributed in the Irish countryside in both marine and freshwater habitats. Otters are solitary and nocturnal and as such are rarely seen. Thus, surveys for Otters rely on detecting signs of their presence. These include spraints (faeces), anal gland secretions, paths, slides, footprints and remains of prey items. Spraints are of particular value as they are used as territorial markers and are often found on prominent locations such as grass tussocks, stream junctions and under bridges. In addition, they are relatively straightforward to identify.

Otters occasionally dig out their own burrows but generally they make use of existing cavities as resting placing or for breeding sites. Suitable locations include eroded riverbanks, under trees along rivers, under fallen trees, within rock piles or in dry drainage pipes or culverts etc. If ground conditions are suitable the holt may consist of a complex tunnel and chamber system. Otters often lie out above ground especially within reed beds where depressions in the vegetation called “couches” are formed. (NRA 2008). Generally, holts or resting areas can be located by detecting signs such as spraints or tracks.

In contrast natal holts which are used by breeding females can be extremely difficult to locate. They are often located a considerable distance from any aquatic habitats and Otters may also use habitats adjoining small streams with minimal or no fish populations. In addition, natal holts are usually carefully hidden and without obvious sprainting sites. Otters do not have a well-defined breeding season.

It is noted that Otters are largely nocturnal, particularly in areas subject to high levels of disturbance as evidenced by the presence of Otters in the centre of Cork and Limerick City. Thus, Otters are able to adapt to increased noise and activity levels; however, breeding holts are generally located in areas where disturbance is lower.

A review of existing records showed that Otter or signs of Otter have been recorded on 31 occasions within grid square W77, the most recent being in September 2018. Otter are known to occur within the Glanmire area and the nearby Glashaboy River which supports a population of salmonids and eels. Although Otter are expected to forage along the Glashaboy River no signs of Otter such as spraints, anal mucus, feeding sign, holts and couches were recorded within 150m of the proposed development site.

7.2 Bats

In Ireland, nine species of bat are currently known to be resident. These are classified into two Families: the *Rhinolophidae* (Horseshoe bats) and the *Vespertilionidae* (Common bats). The lesser horseshoe bat *Rhinolophus hipposideros* is the only representative of the former Family in Ireland. All the other Irish bat species are of the latter Family and these include three pipistrelle species: common *Pipistrellus pipistrellus*, soprano *P. pygmaeus* and Nathusius’ *P. nathusii*, four *Myotids*: Natterer’s *Myotis nattereri*, Daubenton’s *M. daubentonii*, whiskered *M. mystacinus*, Brandt’s *M. brandtii*, the brown long-eared *Plecotus auritus* and Leisler’s *Nyctalus leisleri* bats.

Whiskered and Natterer's bats are listed as 'Threatened in Ireland', while the other species are listed as 'Internationally Important' in the Irish Red Data Book 2: Vertebrates (Whilde, 1993). The population status of both Whiskered and Natterer's bats was considered 'indeterminate' because of the small numbers known of each, a few hundred and approximately a thousand respectively. Ireland is considered to be an international stronghold for Leisler's bat, whose global status is described as being at 'low risk, near threatened' (LR; nt) by the IUCN (Hutson, *et al*., 2001).

Near threatened status is applied to those taxa that are close to being listed as vulnerable (facing a high risk of extinction in the wild in the medium-term future on the basis of a range of criteria defined by the IUCN). The Irish population of the Lesser Horseshoe Bat is estimated at 14,000 individuals and is considered of International Importance because it has declined dramatically and become extinct in many other parts of Europe. Data collected shows that the species increased significantly between from the early 1990's to present.

A review of existing bat records within W77 (NBDC) showed that the Irish bat species listed in **Table 5** have been recorded.

Table 5. Presence of Irish bat species within grid squares W77

Common name	Scientific name	Presence
Lesser Noctule	*Nyctalus leisleri*	Present
Pipistrelle	*Pipistrellus pipistrellus sensu lato*	Present
Soprano Pipistrelle	*Pipistrellus pygmaeus*	Present
Daubenton's Bat	*Myotis daubentonii*	Present
Natterer's Bat	*Myotis nattereri*	Present
Brown Long-eared Bat	*Plecotus auritus*	Present
Whiskered Bat	*Myotis mystacinus*	Present
Lesser Horseshoe	*Rhinolophus hipposideros*	Absent
Nathusius's Pipistrelle	*Pipistrellus nathusii*	Absent

NBDC

It is noted that other species which have not been included within this database are also likely to occur. Lesser horseshoe bat (*Rhinolophus hipposideros*) is the only species of bat listed on Annex II of the Habitats Directive (Directive 92/43/EEC). The closest recorded records for Lesser horseshoe bat is approximately 18km west of the proposed development site (NBDC records). While the remaining Irish bat species; Nathusius' pipistrelle and Brandt's M. brandtii bats have not been recorded in the local area to date. Nathusius' pipistrelle and Brandt's bat, are rarer Irish species, which are less likely to occur.

All bat species are protected under the Wildlife Acts (1976 & 2000) which make it an offence to wilfully interfere with or destroy the breeding or resting place of all species; however, the Acts permit limited exemptions for certain kinds of development. All species of bats in Ireland are listed in Schedule 5 of the 1976 Act and are therefore subject to the provisions of Section 23 which make it an offence to:

- Intentionally kill, injure or take a bat;
- Possess or control any live or dead specimen or anything derived from a bat;
- Wilfully interfere with any structure or place used for breeding or resting by a bat; or

- Wilfully interfere with a bat while it is occupying a structure or place which it uses for that purpose.

All bats are listed on Annex IV of the EU Habitats Directive. The domestic legislation that implements this Directive gives strict protection to individual bats and their breeding and resting places. It should also be noted that any works interfering with bats and especially their roosts, including for instance, the installation of lighting in the vicinity of the latter, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by NPWS. Furthermore, on 21st September 2011, the Irish Government published the European Communities (Birds and Natural Habitats) Regulations 2011 which include the protection of the Irish bat fauna and further outline derogation licensing requirements. **Table 6** summarises the protection given to bats by national and international legislation and conventions.

Table 6. Legislative protection for bats in Ireland

Legislation/Convention	Relevance to Irish bats
Irish Wildlife Act (1976) & Irish Wildlife (Amendment) Act 2000.	It is an offence to wilfully interfere with or destroy the breeding or resting place of bats, (with some exemptions for certain kinds of construction development). Provides for the creation of NHAs.
EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Directive 92/43/EEC), commonly known as the 'Habitats Directive	Lists all the vesper bats in Annex IV as in need of strict protection and also encourages Member States to conserve landscape features such as river corridors, field boundaries, ponds and woodlands. It also requests that Member States establish a system to monitor the incidental capture and killing of the animals listed in Annex IV. The lesser horseshoe bat is further listed in Annex II of the EU Habitats Directive The level of protection offered to lesser horseshoe bats effectively means that areas important for this species are designated as Special Areas of Conservation.
The Convention on the Conservation of European Wildlife and Natural Habitats, commonly known as the 'Berne Convention'.	It obliges states to protect and conserve animals and their habitats, especially those listed as endangered or vulnerable. Also obliges parties to promote national policies for the conservation of wild fauna and natural habitats
The Convention on the Conservation of Migratory Species of Wild Animals, commonly known as the 'Bonn Convention'.	This led to the European Bats Agreement (EUROBATS), which lists a wide range of objectives, including promoting research programmes relating to the conservation and management of bats, promoting bat conservation and public awareness of bats, and identifying and protecting important feeding areas of bats from damage and disturbance.

A study by Lundy *et al.* (2011) examined the relative importance of landscape and habitat associations across Ireland. Maximum Entropy Models (MEM) were constructed for each bat species using records from the National Bat Database from 2000-2009. This method allows species' records that have not been collected in a systematic survey to be analysed. The

results help explain patterns of species' occurrence and predict where species might occur. Landcover (CORINE), topography, climate, soil pH, riparian habitat and human bias factors were incorporated into the models. The analyses provide a picture of the broad scale geographic patterns of occurrence and local roosting habitat requirements for Irish bat species. This also provides a 'habitat suitability' index. The index ranges from 0 to 100, with 0 being least favourable and 100 most favourable for bats. The habitat indices for all Irish bats for the landscape within the vicinity of the proposed development sit is shown in **Table 7**.

Table 7. Model Predicted Habitat suitability indices for All Irish bat species at the proposed development site

Bat species	Common Name	Habitat indices
All Bats		35.56
Pipistrellus pygmaeus	Soprano pipistrelle	50
Plecotus auratus	Brown long-eared bat	51
Pipistrellus pipistrellus	Common pipistrelle	48
Rhinolophus hipposideros	Lesser horseshoe	0
Nyctalus leisleri	Leisler's bat	49
Myotis mystacinus	Whiskered bat	43
Myotis daubentoniid	Daubenton's bat	30
Pipistrellus nathusii	Nathusius' pipistrelle	10
Myotis nattereri	Natterer's bat	39

Source: NBDC

Bats generally make use of large mature trees that contain natural holes, cracks/splits in major limbs, loose bark, hollows/cavities, dense epicormic growth (bats may roost within it) and bird and bat boxes. The importance of trees to bats varies with species, season and foraging behaviour. For Leisler's bats, trees are essential for both summer and winter roosts while Daubenton's and Natterer's bats utilise trees more often during the summer months. Other species such as brown long-eared bats and pipistrelle bats avail of trees in the winter months. In general, individual males throughout the season use tree roosts, more often, while females will use trees for temporary night roosts or night perches for consuming prey. Hollow trees are widely used by bats for both summer and winter roosts (weather dependent) and bats will roost in 'sound' trees in crevices, holes and under split bark. Bats rest, give birth, raise young and hibernate in tree holes, crevices and beneath loose bark. Species of trees utilised by bats include oak, ash, beech and Scots pine. Trees, especially native ones also play host to numerous insect species which are prey items for bat species. Trees also provide shelter for swarming insects which bats will avail of. In addition, trees are important commuting routes for bats. A gap in a hedge/treeline of greater than 10m may force some species of bats to seek an alternative commuting route. Although the site is located in the vicinity of retail and residential developments, illumination of the site is currently low and the site contains large dark areas which could provide bat foraging habitat.

There are no affected trees which could potentially provide roosting habitat for bats. Woodland habitat will be retained. The immature trees which will be removed within the site boundary lack the structural elements such as cracks and crevices that would provide valuable bat roosting habitat.

The existing coach house is a period dwelling which is not occupied and has potential entry points. This building was classified as a moderate value Potential Roost Feature (PRF) (Collins 2016). A bat emergence survey was therefore considered necessary.

7.2.1 Bat emergence survey

A site survey was carried out on the 21st of June 2022 using a Batbox Duet bat detector and Echo Meter Touch 2 PRO bat detector. This survey followed the guidelines set out in *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)* (Collins 2016).

Weather conditions were suitable with bright dry conditions and suitable temperatures (>8oC). The survey covered the building and trees/woodland boundaries of the site.

Three bat species were recorded during the site survey i.e., Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat. A single Leisler's Bat was recorded foraging over the adjoining woodland. One Common Pipistrelle was recorded emerging from a boarded, circular window close to the apex at the front (southern face) of the coach house. No evidence of a significant breeding roost was recorded and it is possible that usage of the building is transitory. Common pipistrelles are crevice dwellers. They use many features on and in a building but relatively rarely enter the roof void. Features used in summer include soffits, fascia's, barge-boards, weather boarding, between roof felt/membrane and tiles/slates, around window frames, in cavity walls, under hanging tiles and lead flashing. In winter, pipistrelle species may use cavity walls or crevices deep in solid walls.

A small number of bats (Common Pipistrelle and Soprano Pipistrelle) were detected foraging within the site, probably 2-3 individuals in total. However, foraging was sporadic and limited in duration. Activity levels at the Glytown Bridge over the Glashaboy River approximately 70m from the site boundary recorded continuous high levels of activity with Common Pipistrelle, Soprano Pipistrelle and Daubentons Bat recorded.

Overall, the proposed development site is considered of local value for common bat species. The Glashaboy River and the woodland area which adjoins the site are the highest value habitats for bats in the local landscape. One Common Pipistrelle was recorded emerging from the coach house. Although likely to be a temporary roost rather than a maternity roost site, specific mitigation will be implemented to ensure there is no impact on roosting bats.

7.3 Other terrestrial mammals

Seventeen other species of terrestrial mammal have been recorded within grid square W77. Eight of which are protected under the Irish Wildlife Act, namely Badger, Pygmy Shrew, Red Squirrel, Hedgehog, Irish Hare, Irish Stoat, Fallow Deer and Sika Deer.

7.3.1 Badger (*Meles meles*)

Badger setts are protected under the provisions of the Wildlife Act 1976, as amended, and it is an offence to intentionally, knowingly or unknowingly kill or injure a protected species, or to wilfully interfere with or destroy the breeding site or resting place of a protected wild animal.

Badger setts are formed by a complex group of interlinked tunnels, and therefore works in proximity to setts can potentially cause damage to a protected species. Badgers are also protected under Appendix III of the Berne. No signs of Badger were recorded during site survey.

7.3.2 Fallow Deer (*Dama dama*)

Ireland's second largest deer species and are the most widespread of the deer, found in nearly every county of the island. In Ireland the fallow deer mainly resides in mature deciduous or mixed woodlands which are close to open grassland. Fallow deer is not likely to occur within or in the vicinity of the proposed site. The site is of negligible value for Fallow Deer.

7.3.3 Hedgehog (*Erinaceus europaeus*)

Listed on Appendix III of the Berne Convention and can be found throughout Ireland, with male hedgehogs having an annual range of around 56 hectares. Hedgehog is unlikely to occur within the proposed development site. The site may be utilised by Hedgehog.

7.3.4 Irish Stoat (*Mustela erminea hibernica*).

Irish stoats occur in most habitats with sufficient cover, including urban areas. It is unlikely that stoat occurs within the proposed development site given the lack of suitable habitat for prey species. The site may be utilised by Irish Stoat.

7.3.5 Red Squirrel (*Sciurus vulgaris*)

Listed on Appendix III of the Berne Convention can be found throughout Ireland. Red squirrel is known to occur in the wider area (NBDC records), however there is no suitable habitat for Red Squirrel within the proposed development site. The woodland adjoining the site may be used by Red Squirrel.

7.3.6 Irish hare (*Lepus timidus hibernicus*)

Listed on Appendix III of the Berne Convention, Annex V(a) of the EC Habitats Directive (92/43/EEC) and as an internationally important species in the Irish Red Data Book.

The Irish hare is adaptable and lives in a wide variety of habitats. It typically reaches its highest densities on farmland, particularly where there is a mix of grassland and arable fields along with hedgerows and other cover. There is no suitable habitat for this species within the proposed development site. The site is of negligible value for Irish Hare.

7.3.7 Pygmy Shrew (*Sorex minutus*)

Common throughout mainland Ireland and has a preference for habitats such as hedgerows and grasslands; they have also been found utilizing stone walls. Pygmy Shrew could potentially occur within the proposed development site. The site may be utilised by Pygmy Shrew.

7.3.8 Sika Deer (*Cervus nippon*)

Sika Deer is the smallest of the three deer species now resident in Ireland. They are non-native species with the first Irish population introduced to the Powerscourt estate in county

Wicklow in 1860 then to Killarney four years later. They are protected under the Wildlife Act in the republic and under the 1985 Wildlife Order in Ulster although they are listed as a quarry species and can be hunted under license. Sika deer are mainly associated with woodland areas which have open grasslands nearby. There is no suitable habitat for this species within the proposed development site. The proposed development site is of negligible value for Sika Deer.

7.4 Reptiles and Amphibians

According to records held by the NBDC, Common Frog (*Rana temporaria*) and Smooth Newt (*Lissotriton vulgaris*) are the only amphibians recorded within grid square W77 (NDBC). The reptile species Common Lizard (*Zootoca vivipara*) and Red-eared Terrapin (*Trachemys scripta*) have also been recorded.

Common Frog is listed in Annex V of the EU Habitats Directive and is protected under the Wildlife Acts. The species was not recorded during the site survey.

The Smooth Newt is the only member of the Urodela (the tailed amphibians) found in Ireland. While commonly encountered near water bodies, adult newts are actually terrestrial, only returning to water bodies to breed. There is no suitable habitat for this species within the site boundary.

There are no wetland habitats within the proposed development site and it is of negligible value for amphibian species.

Common Lizard is Ireland's only native terrestrial reptile and is so protected under the Wildlife Act. The species has not been recorded the vicinity of the proposed development site (NBDC) and it is unlikely that the species occurs within or in proximity to the proposed development site.

Red-eared Terrapin is a non-native species, first reported in the wild in Ireland in 2003. It is a regulated invasive species of Union concern under the European Regulation on the prevention and management of the introduction and spread of invasive alien species. There is currently an EU wide ban on the sale of this species and personal and zoo ownership are being phased out (European Commission, 2017).

The proposed development site is of negligible value for reptile species.

7.5 Birds

The National Biodiversity Centre online data base lists 162 species of bird recorded within grid square W77. Of these species, a number are listed under Annex I of the Birds Directive and are Red Listed Birds of Conservation Concern in Ireland (Gilbert *et al*. 2021) (**Table 8**). Bird species listed in Annex I of the Birds Directive are considered a conservation priority. During the survey, all birds seen or heard within the development site were recorded. Certain bird species are listed by BirdWatch Ireland as Birds of Conservation Concern in Ireland (BOCCI). These are bird species suffering declines in population size (Gilbert *et al*. 2021). BirdWatch Ireland and the Royal Society for the Protection of Birds have identified and classified these species by the rate of decline into Red and Amber lists. Red List bird species are of high conservation concern and the Amber List species are of medium conservation. Green listed

species are regularly occurring bird species whose conservation status is currently considered favourable.

Table 8. Bird species listed under Annex I of the Birds Directive and/or classified as Red Listed Birds of Conservation Concern in Ireland recorded within grid square W77

Species	Birds Directive Annex I	BOCCI Red List
Whooper Swan	X	
Great Northern Diver	X	
Little Egret	X	
Little Gull	X	
Peregrine Falcon	X	
Golden Plover	X	X
Bar-tailed Godwit	X	X
Kingfisher	X	
Common Tern	X	
Corncrake	X	X
Dunlin	X	X
Hen Harrier	X	
Mediterranean Gull	X	
Merlin	X	
Short-eared Owl	X	
Wigeon		
Shoveler		X
Tufted Duck		
Long-tailed Duck		X
Goldeneye		X
Lapwing		X
Woodcock		X
Curlew		X
Redshank		X
Black-headed Gull		
Herring Gull		
Barn Owl		X

Species	Birds Directive Annex	BOCCI
	I	Red List
Meadow Pipit		X
Grey Wagtail		X
Yellowhammer		X

Source NDBC

A bird survey was carried out in conjunction with habitat surveys on the 21st and the 30th of June 2022. During the survey, all birds seen or heard within the development site were recorded. Signs of birds were also noted e.g., nests. All birds recorded during site surveys of the proposed works areas are common in the local landscape. No Annex I species or BOCCI species were recorded onsite and no SCI species for the Cork Harbour SPA were recorded. Bird species recorded within the site are shown in **Table 9**.

Table 9. Bird Species recorded during site surveys.

Species		Birds Directive Annex	BOCCI	
		I	Red List	Amber List
Corvus frugilegus	Rook			
Fringilla coelebs	Chaffinch			
Erithacus rubecula	Robin			
Carduelis carduelis	Goldfinch			
Hirundo rustica	Swallow			X
Parus caeruleus	Blue tit			
Sturnusvulgaris	Starling			X
Motacilla alba	Pied Wagtail			
Columba livia domestica	Feral Pigeon			
Turdus merula	Blackbird			
Phylloscopus collybita	Chiffchaff			
Troglodytes troglodytes	Wren			
Corvus cornix	Hooded Crow			

According to the Cork City Council *Glashaboy Flood Relief Scheme Constraints Report*, the Annex I species Kingfisher *Alcedo atthis* has been recorded within the Glashaboy River. However, the proposed development is location approximately 70m from the river and is screened from the river by existing woodland. No impact on Kingfisher will occur.

There is no suitable amenity grassland within the proposed development that could potentially be used as *ex situ* foraging grounds for SCI waders for the Cork Harbour SPA such as Golden Plover and Curlew. The largely manmade habitats onsite do not provide high value habitat for these species. Overall, the proposed development site is of local value for terrestrial bird species that are relatively common in the Irish countryside. Boundary vegetation provide some

roosting or nesting habitat for birds within the proposed development site. The proposed development site is of Local importance (Higher value) for birds.

7.6. Invasive Species

Non-native plants are defined as those plants which have been introduced outside of their native range by humans and their activities, either purposefully or accidentally. Invasive non-native species are so-called as they typically display one or more of the following characteristics or features: (1) prolific reproduction through seed dispersal and/or re-growth from plant fragments; (2) rapid growth patterns; and, (3) resistance to standard weed control methods.

Where a non-native species displays invasive qualities and is not managed it can potentially: (1) out compete native vegetation, affecting plant community structure and habitat for wildlife; (2) cause damage to infrastructure including road carriageways, footpaths, walls and foundations; and, (3) have an adverse effect on landscape quality. The NBDC lists a number of both aquatic and terrestrial high impact invasive species which have been recorded within grid square W77 (**Table 10**).

Table 10. High impact invasive species recorded in W77

Common Name	Latin Name
Canada Goose	*Branta canadensis*
Ruddy Duck	*Oxyura jamaicensis*
Cherry Laurel	*Prunus laurocerasus*
Common Cord-grass	*Spartina anglica*
Knotweed	*Fallopia japonica x sachalinensis = F. x bohemica*
Giant Hogweed	*Heracleum mantegazzianum*
Giant Knotweed	*Fallopia sachalinensis*
Giant-rhubarb	*Gunnera tinctoria*
Indian Balsam	*Impatiens glandulifera*
Japanese Knotweed	*Fallopia japonica*
Parrot's-feather	*Myriophyllum aquaticum*
	Rhododendron ponticum
Harlequin Ladybird	*Harmonia axyridis*
American Mink	*Mustela vison*
Brown Rat	*Rattus norvegicus*
Fallow Deer	*Dama dama*

Common Name	Latin Name
Feral Ferret	*Mustela furo*
House Mouse	*Mus musculus*
Sika Deer	*Cervus nippon*

Source NBDC database

Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 make it an offence to plant, disperse, allow dispersal or cause the spread of certain species e.g. Japanese knotweed and Rhododendron, keep the plant in possession for purpose of sale, breeding, reproduction, propagation, distribution, introduction or release, keep anything from which the plant can be reproduced or propagated from the species, without a granted licence and keep any vector material for the purposes of breeding, distribution, introduction or release. Regulation 49 deals with the 'Prohibition on introduction and dispersal' while Regulation 50 deals with the 'Prohibition on dealing with and keeping certain species'. Regulation 50 has yet to be brought into Irish law. Regulation 74 is a transitional provision in relation to Regulation 49 and 50.

The Wildlife (Amendment) Act 2000 states that anyone who plants or otherwise causes to grow in a wild state in any place in the State any species of (exotic) flora, or the flowers, roots, seeds or spores of (exotic) flora shall be guilty of an offence. There is a statutory obligation under S.I. 477 of 2011 of the European Communities (Birds and Natural Habitats) Regulations 2011 to address invasive species in Ireland.

The non-native invasive species Buddleia *Buddleia davidii*, was recorded in eastern section of the site. Buddleia is classified as an Amber Threat species by Invasive Species Ireland which under the right ecological conditions may have a negative impact on native species or habitats. Buddleia is also included in the NRA *Guidelines on the Management of Noxious Weeds and Non-native Species on National Roads* (NRA, 2010) as this species has been shown to have an adverse impact on landscape quality, native biodiversity or infrastructure; and is likely to be encountered during road schemes.

Himalayan Honeysuckle *Leycesteria formosa* was recorded within the treeline at the north of the site and within areas of recolonising bare ground. This species are listed as "Amber List: Uncertain Risk" by the NBDC i.e., their ecological impact remains uncertain due to lack of data showing impact or lack of impact.

The invasive species Winter Heliotrope *Petasites fragrans* was recorded within the woodland understorey plants to the south of the site. Winter Heliotrope is included in the *NRA Guidelines on the Management of Noxious Weeds and Non-native Species on National Roads* (NRA, 2010) as this species have been shown to have an adverse impact on landscape quality, native biodiversity or infrastructure; and are likely to be encountered during road schemes.

7.7 Other species

Inland Fisheries Ireland (IFI) carried out a survey of the Glashaboy catchment, in 2018 (SWRDB 2018). This survey recorded five fish species within Glashaboy River catchment. Brown trout *Salmo trutta* Atlantic Salmon *Salmo salar* and European eel *Anguilla anguilla* were recorded. Atlantic Salmon are protected under Annex II and Annex IV of the Habitats Directive.

European Eel is listed by the International Union for Conservation of Nature (IUCN) as a critically endangered species, with numbers in catastrophic decline. Within the greater Glashaboy catchment lamprey species (unnamed) and Three-spined stickleback *Gasterosteus aculeatus* were also recorded.

A search of the NBDC database was carried out to determine if any protected, rare or notable species of invertebrates within 2km of the proposed development site (W77H). One threatened species of invertebrate Large Red Tailed Bumble Bee (*Bombus (Melanobombus) lapidarius*) was recorded within W77H in 2019. During the habitats survey no rare or notable species of invertebrate were observed within the application site.

Whilst no site is not without invertebrate interest, it is considered unlikely, given the habitat types, that the proposed development site would support any protected invertebrate species. While the loss of some recolonising bare ground habitat and/or early successional species at the site may lead to a short-term loss of invertebrate foraging habitat, the proposed planting at the site is likely to provide alternative foraging habitat for invertebrate species.

8. Water Quality

8.1 River Basin Management Plan for Ireland 2018 – 2021 (2nd Cycle)

The Water Framework Directive (WFD) sets out the environmental objectives which are required to be met through the process of river basin planning and implementation of those plans. Specific objectives are set out for surface water, groundwater and protected areas. The challenges that must be overcome in order to achieve those objectives are very significant. Therefore, a key purpose of the River Basin Management Plan (RBMP) is to set out priorities and ensure that implementation is guided by these priorities.

The second-cycle RBMP aims to build on the progress made during the first cycle. Key measures during the first cycle included the licensing of urban waste-water discharges (with an associated investment in urban waste-water treatment) and the implementation of the Nitrates Action Programme (Good Agricultural Practice Regulations). The former measure has resulted in significant progress in terms both of compliance levels and of the impact of urban waste-water on water quality. The latter provides a considerable environmental baseline which all Irish farmers must achieve and has resulted in improving trends in the level of nitrates and phosphates in rivers and groundwater. It is acknowledged, however, that sufficient progress has not been made in developing and implementing supporting measures during the first cycle.

Overall, RBMP assesses the quality of water in Ireland and presents detailed scientific characterisation of our water bodies. The characterisation process also takes into account wider water quality considerations, such as the special water-quality requirements of protected areas. The characterisation process identifies those water bodies that are *At Risk* of not meeting the objectives of the WFD, and the process also identifies the significant pressures causing this risk. Based on an assessment of risk and pressures, a programme of measures has been developed to address the identified pressures and work towards achieving the required objectives for water quality and protected areas. Data relating to the watercourses within the study area is provided in **Table 11** and the location of these shown in **Figure 6.** Limited data of the 3rd cycle of the WFD has been released by the EPA and this also referred to below where relevant.

Table 11. WFD Status

Catchment: Lee, Cork Harbour and Youghal Bay (Code 19) – 2nd Cycle

This catchment includes the area drained by the River Lee and all streams entering tidal water in Cork Harbour and Youghal Bay and between Knockaverry and Templebreedy Battery, Co. Cork, draining a total area of 2,153km². The largest urban centre in the catchment is Cork City. The other main urban centres in this catchment are Ballincollig, Macroom, Carrigaline, Crosshaven, Blarney, Glanmire, Midleton, Carrigtohill, Cobh, Passage West and Belvelly. The total population of the catchment is approximately 328,854 with a population density of 153 people per km².

Several small coastal rivers drain the area to the southeast of Cork Harbour and the area at the eastern extreme of the catchment is drained by the Womanagh River which flows into the sea on the western side of Youghal Bay.

The Lee-Cork Harbour catchment comprises 18 sub-catchments with 92 river water bodies, three lakes, 13 transitional, six coastal water bodies and 16 groundwater bodies. There are five heavily modified and no artificial water bodies in the catchment.

The catchment assessment notes that:

- Twenty-two river water bodies and all three lake water bodies in the catchment are At Risk of not meeting their water quality objectives. Measures will be needed in these water bodies to improve the water quality outcomes.
- There are eight Transitional and coastal water bodies in the catchment that are At Risk of not meeting their water quality objectives.
- Outer Cork Harbour water quality was defined as *Good* in the period from 2013-2018. Water quality in Cork Harbour was defined as *Moderate* in the same period.
- Water quality on the Owenboy Estuary, a transitional waterbody, was unassigned.
- There are five Special Areas of Conservation (SACs) in the catchment, not all of which have water quality and/or quantity conservation objectives for their qualifying interests.
- Diffuse urban pressures, caused, for example, by misconnections, leaking sewers and runoff from paved and unpaved areas, have been identified as a significant pressure in five river water bodies.
- Three river water bodies, two of which are on the Owenboy (Cork_020 and 040) subcatchments are subject to extensive modification due to channelization.
- Agriculture is a significant pressure on two transitional water bodies Glashaboy estuary and Owenboy estuary

The proposed development site is located within the Sub-catchment Glashaboy [L.Mahon]_SC_010. One out of six river water bodies within this sub-catchment is AT RISK i.e. Butlerstown_010 due to Moderate biological status. Siltation is likely to be the issue within this water body possibly due to road activities.

Wastewater discharges from the proposed development will discharge into Cork Harbour at Lough Mahon.

Waterbodies relevant to the proposed project

Waterbody	WFD Status	Significant Pressure	Pressure Category
Glashaboy (Lough Mahon_030	Not at risk	No	n/a
Glashaboy Estuary	At risk	Yes	Agriculture/urban runoff

Catchment: Lee, Cork Harbour and Youghal Bay (Code 19) – 2nd Cycle			
Lough Mahon	At risk	Yes	Urban wastewater

Source: EPA envision mapping and www.catchments.ie

Figure 6. WFD waterbodies in the vicinity of the proposed development | Source: EPA Envision mapping https://gis.epa.ie/EPAMaps/) | not to scale

9. Evaluation of Potential Impacts

During construction, potential impacts could arise from increased noise and disturbance which could result in the disturbance/displacement of birds and mammals. There will be a nett, permanent loss of terrestrial habitats. Increased traffic and noise associated with the site could potentially increase levels of disturbance which could result in the disturbance/displacement of birds and mammals. Increased dust levels during construction could have localised impacts on vegetation and habitats.

Discharges of silt, were they to occur through inadequate control of surface water run-off, could impact on fisheries habitat and aquatic ecology in local watercourses. Minor spills of hydrocarbons during construction could impact on surface water quality with resultant impacts on aquatic ecology. Wastewater discharges during the operational phase could impact on the water quality of the Cork Harbour.

9.1 Do Nothing' Impact

Most of the habitats to be affected have been significantly modified from the natural state by human activity. If habitats were left unmanaged a general pattern of succession from

recolonising scrub to woodland would be expected to occur. If sufficient time elapsed without development, the unused areas of the proposed development area would be expected to develop a covering of woodland with a mix of native and introduced species.

9.2 Impact Appraisal

When describing changes/activities and impacts on ecosystem structure and function, important elements to consider include positive/negative, extent magnitude, duration, frequency and timing, and reversibility (IEEM, 2018).

Section 3.7 of the *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'*, (EPA 2022) provides standard definitions which have been used to classify the effects in respect of ecology. This classification scheme is outlined below in **Table 12**.

Table 12. EPA Impact Classification

Impact Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment.
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment.
Significance	Imperceptible	An effect capable of measurement but without significant consequences.
	Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging trends.
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound	An effect which obliterates sensitive characteristics.
Duration and Frequency	Momentary Effects	Effects lasting from seconds to minutes.
	Brief Effects	Effects lasting less than a day.
	Temporary Effects	Effects lasting less than a year.
	Short-term	Effects lasting one to seven years.
	Medium-term	Effects lasting seven to fifteen years.
	Long-term	Effects lasting fifteen to sixty years.
	Permanent	Effects lasting over sixty years.
	Reversible Effects	Effects that can be undone.
	Frequency	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost.
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic	Where the resultant effect is of greater significance than the sum of its constituents.

Impact Characteristic	Term	Description
	'Worst Case'	The effects arising from a development in the case where mitigation measures substantially fail.

9.3. Potential Impacts on Terrestrial Habitats

Impacts on terrestrial habitats are generally restricted to direct removal of habitats. Indirect impacts may occur via damage and disturbance arising from vehicular activities and storage of overburden and materials. Levels of dust during construction are predicted to be low and effectively managed by mitigation. The impact on vegetation in adjoining habitats from wind-blown dust is predicted to be imperceptible. No rare floral species were recorded within the study area. Based on the criteria outlined by EPA, 2022, as described above, the predicted impacts are detailed in **Table 13.**

Table 13. Predicted impacts as a result of the proposed development

Habitat	Habitat value (NRA guidelines)	Potential Impacts
Dry meadow and grassy verge GS2/Scrub WS1	Local value (Lower importance)	Most of this habitat will be removed as part of the proposed development. The potential impact on this will be negative, not significant and long-term
Recolonising bare ground ED3/Dry meadow and grassy verge GS2/ Scrub WS1	Local value (Higher importance)	Most of this habitat will be removed as part of the proposed development. The potential impact on this will be negative, slight and long-term
Stone Walls and Other Stonework BL1	Local value (Lower importance)	This habitat will be removed The potential impact on this will be negative, not significant and long-term
Buildings and artificial surfaces BL3	Local value (Higher importance)	Coach house used by Pipistrelle bat, will be retained. The potential impact on this will be negative, slight and long-term
Mixed broadleaved woodland WS1	Local value (Higher importance)	Habitat will be retained. No impact
Amenity grassland GA2/ Buildings and artificial surfaces BL3	Local value (Lower importance)	This habitat will be removed. The potential impact on this will be negative, not significant and long-term

9.3.1 Potential impacts from spread of invasive species

No scheduled or high-risk invasive species were recorded within the proposed development site or works area. Two other medium impact invasive species namely Buddleia and Himalayan Honeysuckle as well as Winter Heliotrope were recorded within the proposed development site boundary. These species are classified as medium/low impact invasive species by the NBDC. There is potential during the construction phase for invasive species to be spread within the planning boundary, thus impacting negatively on adjoining habitats.

9.4 Potential Impacts on Fauna

9.4.1 Bats

Small numbers of bats were recorded foraging within the proposed development site. The immature trees and scrub earmarked for removal do not provide suitable roosting habitat for bats. The habitats which dominate the site are considered of moderate value for local bat populations, and their removal will have a slight negative impact. Increased lighting at the site may have an adverse effect on local bat populations utilising woodland habitats on the periphery of the site.

Lighting deters some bat species in particular Myotis species, from foraging. Studies have shown that illumination levels as low as 0.06 lux can influence the behaviour of bats. Even a full moon night (0.02 lux) can reduce bat activity within more sheltered, darker wildlife corridors and foraging areas (e.g., woodlands). No Myotis species were recorded during the site survey. It is noted that pipistrelle species appear to be more tolerant of light and disturbance (Speakman 1991; Stones et al. 2009; Haffner 1986). Leisler's Bats will also opportunistically feed on such insect gatherings in lit areas (Bat Conservation Ireland 2010).

As construction works will largely be confined to daytime hours, lighting during the construction phase will be minimal and there will no impact on foraging bats. During operation, lighting at the site will increase from current levels. This may result in a loss of dark areas for foraging bats, particularly in habitats bordering the site. However, given the small numbers of bats which forage at the site, the impacts on local bat populations during operation will not be significant. Bats are likely to continue to forage in dark areas within and adjacent to the proposed development site.

It is noted that as part of the landscape plan for the development, woodland at the site will be retained and additional planting is proposed. Lighting mitigation measures are also included in **Section 10.4 and Section 10.7**. These measures will help to mitigate against the loss of scrub/woodland habitat within the site and minimise light spillage onto the adjoining woodland. Overall, the impact will be localised and is unlikely to significantly impact on overall bat populations as there will no loss of critical resources for bats. This impact on local bat populations will be negative, slight and long-term at a local level.

9.4.2 Otter

Otter have been recorded within the Glashaboy River which is located approximately 70m to the north of the site. The Glashaboy River supports a population of fish providing prey for Otter. However, no Otter breeding holts were recorded during the site surveys. The proposed works will result in an increase in noise and disturbance during the construction phase during

daytime hours. However, given Otter's largely nocturnal habits, ability to move away from short-term disturbance and ability to habituate to anthropogenic noise and disturbance, the impact on Otter during construction will not be significant. The proposed development site is located within an existing urban setting.

No instream works are required, and mitigation measures will ensure light and noise levels during construction will be kept to a minimum. Following construction, noise and disturbance is likely to increase. However, given the baseline noise and disturbance, fauna which use the area are likely to be habituated to a similar level of disturbance and Otter are expected to continue to use habitats in proximity to the planning boundary following construction. Overall, the impact on Otter is predicted to be long-term and slight.

9.4.3 Other Mammals

Badger, Hedgehog, Irish Stoat etc have all been recorded within grid square W77. Mammal species which are protected under the Irish Wildlife Act 1976, as amended, such as Hedgehog and Pygmy Shrew could potentially occur within the proposed development site, although no signs of these species were recorded. Although the habitats to be directly affected may form part of the territories of various mammal species, they do not provide critical resources and direct impacts on these habitats will be localised and temporary. Whilst increased noise and disturbance is predicted to occur during construction and to a lesser degree during operation. The predicted noise level will not be excessive in the context of normal domestic and road traffic levels. The impact on other mammals is predicted to be slight in the short-term and imperceptible in the long-term.

9.4.4 Birds

The terrestrial bird species recorded within the proposed development site are typical for the habitats onsite and are generally common. No rare or uncommon bird species or species of high conservation value were recorded. However, there will be a nett loss of common bird breeding and foraging habitat within the proposed development site i.e., recolonising bare ground, grassland/scrub. The landscape plan for the proposed development includes the retention of the woodland habitat along the boundaries of the site as well as new planting. Grassland areas will also be provided within the landscape plan. These will provide some alternative foraging habitat for birds.

Some displacement of feeding birds may occur during construction due to increased noise and disturbance. Disturbance can cause sensitive species to deviate from their normal, preferred behaviour, resulting in stress, increased energy expenditure and, in some cases, species mortality.

It is noted that the area in proximity to the proposed development is subject to disturbance from existing residential and therefore any birds which utilise this area will have habituated to high levels of daytime disturbance. Whilst works could potentially disrupt feeding patterns, given the availability of similar habitat in the surrounding area and the ability of birds to move away from disturbance, the impact on the feeding behaviour of these species is predicted to be imperceptible.

During the operational phase, the levels of activity will stabilise and birds in the surrounding landscape will be expected to habituate to any increased noise and disturbance levels. The

impact on terrestrial birds, in habitats adjoining the proposed development site is therefore predicted to be negative, not significant and long-term.

9.4.5 Other species

No signs of amphibians were recorded and there are no wetland habitats suitable for these species within the site boundary. The site is negligible value for amphibians and reptiles. The proposed development area is only likely to support common invertebrate species. Fish species including Brown Trout and Atlantic Salmon are known to occur in the Glashaboy River. However, no instream works are proposed, and mitigation measures will ensure there is no impact on water quality from the proposed development. Given that the habitats which will be affected are relatively common in the surrounding landscape, any impact on these species will be slight to not significant.

9.5 Potential impact on water quality

9.5.1 Impacts on water quality during the construction phase

Potential impacts on aquatic habitats which can arise from this type of development include increased silt levels in surface water run-off, inadvertent spillages of hydrocarbons from fuel and hydraulic fluid and increased nutrients from treated wastewater.

In the absence of appropriate design and mitigation, high levels of silt in surface water run-off from construction works, could theoretically impact on fish species. If of sufficient severity, adult fish could theoretically be affected by increased silt levels as gills may become damaged by exposure to elevated suspended solids levels. Excessive siltation can cause eggs and fry to be smothered. In particular impacts on spawning lamprey and salmonids can be significant. If of sufficient severity, aquatic invertebrates may be smothered by excessive deposits of silt from suspended solids. In areas of stony substrate, silt deposits may result in a change in the macro-invertebrate species composition, favouring less diverse assemblages and impacting on sensitive species. Aquatic plant communities may also be affected by increased siltation. Submerged plants may be stunted and photosynthesis may be reduced.

Inadvertent spillages of hydrocarbons during construction could introduce toxic chemicals into the aquatic environment via surface water run-off or groundwater contamination and have a direct toxicological impact on habitats and fauna.

During construction there may be an increased probability of silt discharging from the proposed development site. In the absence of appropriate design and mitigation, high levels of silt in surface water run-off could theoretically arise. However, as part of the proposed construction process, mitigation measures have been specified to ensure that water quality within the Glashaboy River and are not impacted during construction works. Therefore, there will be no significant impact on surface water from the from the proposed development during the construction phase. No significant impact on downstream aquatic receptors including Cork Harbour SPA, Dunkettle Shores pNHA and/or other pNHA sites will occur.

9.5.2 Impacts on water quality during the operational phase

Wastewater discharges

The proposed residential development could potentially result in an increase in nutrients discharging to Cork Harbour via the Cork City Wastewater Treatment Plant (WWTP). Increased nutrients can potentially impact on estuarine habitats by changing baseline ecological conditions and increasing algal growth.

The proposed residential development could potentially result in an increase in nutrients discharging to Cork Harbour via the Lough Mahon discharge for the Cork City WWTP. Increased nutrients can potentially impact on estuarine habitats by changing baseline ecological conditions and increasing algal growth, which in turn could impact on feeding success for birds listed as qualifying interests for the Cork Harbour SPA.

The Cork City WWTP has a design capacity i.e. Population Equivalent (P.E.) of 413,200. The WWTP obtained a discharge licence (Reg: D0033-01) from the EPA and has assigned emission limit values (ELV's) for a range of parameters to ensure a high degree of protection to the Lough Mahon and surrounding waters.

Treated effluent from the proposed development will discharge from the Cork City WWTP via the main treated effluent line. The discharge licence assigns ELV's for biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS), Total Nitrogen (Total N), Total Phosphorous (Total P), Ammonia Total (as N), orthophosphate (As P) and pH. The ELVs are set based on the full design capacity (P.E 413,200) and are aimed at providing a high degree of protection to the receiving water body and to ensure the receiving waterbody is capable of accommodating the proposed discharge without causing or exacerbating a breach in the relevant standards.

Based on the planned occupancy, the P.E. for the proposed development has been calculated at 216 (2.7 per unit). This would increase the current WWTP load from 241,480 (based on 2020 EPA data) to 231,000 which is well within the 413,200 P.E. design capacity. Thus, given the limited scale of the proposed development and the ability of the WWTP to cater for the additional loading, no impact is expected.

The AER notes that the final effluent from the Primary Discharge Point was non-compliant with the Emission Limit Values in 2022. The noncompliance's with the ELVs were in relation to Total P (mg/l) and Total N (mg/l). This non-compliance was because nutrient removal does not form part of the WWTP process. In relation to ongoing monitoring of water quality, the 2022 AER concluded the following:

- The coastal/transitional ambient monitoring results do not meet the required EQS. The EQS relates to the Oxygenation and Nutrient Conditions set out in the Surface Water Regulations 2009.
- The WWTP discharge was not compliant with the ELV's set in the wastewater discharge licence for the following: BOD, 5 days with Inhibition (Carbonaceo
- mg/l, Total Nitrogen mg/l.
- The ambient monitoring results do not meet the required EQS at the upstream and the downstream monitoring locations. The EQS relates to the Oxygenation
- and Nutrient Conditions set out in the Surface Water Regulations 2009.
- The discharge from the wastewater treatment plant does not have an observable impact on the water quality.

The discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status. Overall, the discharge from the WWTP does not have an observable negative impact on receiving water quality nor a negative impact on the Water Framework Directive Status. The addition of the effluent discharge from the proposed residential development to the Cork City WWTP is well within its design capacity and will not comprise the operational capability of the WWTP to treat effluent to comply with emission limit values. Therefore, the impacts from the proposed development will be negligible given the current operating conditions at the WWTP.

Surface water discharges

The storm water system will involve a network of underground pipelines and manholes discharging to a public storm sewer on the main road via the new attenuation system, which will be fitted with flow control devices to ensure no increase in peak flows and an oil interceptor and silt trap to remove any traces of oil and silt washed off road surfaces. Given the surface water design measures, the impact from surface water runoff during the operational phase is predicted to be neutral. No significant impact on downstream aquatic receptors including Cork Harbour SPA, Dunkettle Shores pNHA and/or other pNHA sites will occur.

9.6 Cumulative Impacts

Cumulative impacts on fauna chiefly relate to increased noise and activity levels and potential impacts on water quality. In-combination impacts from noise/disturbance are likely to be most pronounced during construction. This is a short-term impact which will be localised. During operation, small volumes of traffic will be generated and noise levels are unlikely to be significantly above existing levels. As this proposed development is not predicted to significantly increase long-term noise and disturbance levels or impact significantly on water quality, no significant cumulative impacts have been identified.

10. Mitigation Measures

The mitigation measures have been drawn up in line with current best practice and include an avoidance of sensitive habitats at the design stage. It is clear that the mitigation measures are designed to achieve a lowering or reducing of the risk of impact to acceptable levels. The risk that the mitigation measures will not function effectively in preventing significant ecological impacts is low. The likely success of the proposed mitigation measures is high. The following mitigation measures will be implemented.

10.1 Construction Phase Mitigation Measures

Construction best practice measures (of relevance in respect of any potential ecological impacts) will be implemented throughout the project, including the preparation and implementation of detailed method statements. The works will incorporate the relevant elements of the guidelines outlined below. Further detail on mitigation is provided in the document *Construction Environmental Management Plan – Residential Development At Glyntown, Glanmire, Cork City* (DOSA, 2022).

- NRA (2010) *Guidelines for the Management of Noxious Weeds and Non- Native Invasive Plant Species on National Roads*. National Roads Authority, Dublin.
- Murphy, D. (2004) *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites*. Eastern Regional Fisheries Board, Dublin.
- IFI (2016) *Guidelines on protection of fisheries during construction Works in and adjacent to waters* (IFI, 2016)
- H. Masters-Williams et al (2001) *Control of water pollution from construction sites. Guidance for consultants and contractors (C532).* CIRIA.
- E. Murnane, A. Heap and A. Swain. (2006) *Control of water pollution from linear construction projects. Technical guidance (C648). CIRIA.*
- E. Murnane et al., (2006) *Control of water pollution from linear construction projects. Site guide (C649). CIRIA.*

All personnel involved with the project will receive an on-site induction relating to operations and the environmentally sensitive nature of the proximity of the Glashaboy River to re-emphasize the precautions that are required as well as the mitigation to be implemented.

- Work to agreed plans, methods and procedures to eliminate and minimise environmental impacts,
- Understand the importance of avoiding pollution on-site, including noise and dust, and how to respond in the event of an incident to avoid or limit environmental impact;
- Respond in the event of an incident to avoid or limit environmental impact;
- Report all incidents immediately to their line manager;

- Monitor the workplace for potential environmental risks and alert the immediate line manager if any are observed; and
- Co-operate as required, with site inspections.

10.2 Protection of Water Quality

- A silt fence in compliance with CIRIA C532 shall be used as a mitigation measure to prevent silting up of the adjoining water course. The silt fence shall be erected along the northern boundary to control water pollution from the construction site to the Glashaboy River
- A Site Environment Plan (SEP) identifying fuel storage and refuelling locations will be developed and this plan will also identify the spill kit locations. Spill response kits will be required for each piece of heavy equipment (i.e. Excavators, Loaders, Trucks) which will be at least 21 litre drum size each with spill pads, sorbent, small boom, plastic garbage bag and gloves.
- Silt traps will be installed on surface water drains during the site development works.
- Constructing buildings and roads above the flood level to ensure that back flows through the surface water outfalls will not occur.
- All foul and other waste water will be discharged to the foul drainage system.
- The storm drainage system with associated hydrocarbon interceptors and silt collection will be cleaned and maintained on an on-going basis throughout its lifetime in a manner and frequency that is in line with guidelines and ensures water-quality protection during/after the cleaning/maintenance processes.

10.3 Management of hydrocarbons

- Diesel tanks, used to store fuel for the various items of machinery, will be self-contained and double-walled.
- Refuelling will be carried out from these tanks or from delivery vehicles and will not be left unattended.
- Fuels, lubricants and hydraulic fluids for equipment used on the construction site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice - (Enterprise Ireland BPGCS005).
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the site and properly disposed of.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.
- The development's road network will be finished with tarmac or asphalt surface which will discharge runoff to a piped drainage system.

- Proven engineering practice will apply during the hydraulic design process.
- Surface water drains will be installed in roads and streets and in pre-determined wayleaves adjacent to building structures.
- Spillage and leaks of oil from cars parked in the development during the operational phase is unavoidable. To reduce the potential impacts, oil interceptors will be incorporated into the site drainage design.
- The area is serviced by mains gas and this utility will be provided to the new development. The use of home heating oil is therefore eliminated so the risk has been removed.

10.4 Lighting

During construction site lighting will typically be provided by tower mounted temporary portable construction floodlights. The floodlights will be cowled and angled downwards to minimise spillage to surrounding properties. The following measures will be applied in relation to site lighting:

- Lighting will be provided with the minimum luminosity sufficient for safety and security purposes. Where practicable, precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas
- Lights will be switched off when not in use
- Lighting will be positioned and directed so that it does not to unnecessarily intrude on adjacent ecological receptors and structures used by protected species. The primary area of concern is the potential impact on woodland on the boundary of the site. There will be no directional lighting focused towards these boundary habitats and cowling and focusing lights downwards will minimise light spillage.
- Works will primarily take place during hours of daylight to minimise disturbance to any nocturnal mammal species.

10.5 Noise and vibration

- Details of construction activities, prediction levels/assessments will be discussed with the relevant authority, both prior to construction and during construction. Detailed construction programmes will be available in advance of work starting on site;
- Where work outside of agreed hours or likely to exceed specified noise limits is necessary then this shall only proceed subject to notification to Cork City Council Environmental Health Officer and local residents, and approval given.
- Except for emergency situations, notification will be in advance of any requirement for out of hours/noisy working.
- Where the potential for noise exists, 'Best Practicable Means' will be used to reduce noise to achieve compliance consistent with the recommendations of BS 5228, and may include:
- Careful selection of plant items, construction methods, programming, and implementing a 'noise and vibration protocol', which outlines monitoring frequency and action levels etc;
- Design and use of site hoarding and screens/noise barriers, to provide acoustic screening at the earliest opportunity;
- Vehicles and machinery will not be left running when not in use (i.e. no idling);
- Choice of routes and programming for the transport of construction materials.
- Noise during site clearance and construction shall not exceed 65 db (a), Leq 30 minutes and the peak noise shall not exceed 75 dB(A), when measured at any point off site.
- BS 5228 applies a noise limit of 70 dBA between 07:00 am and 19:00 pm outside the nearest window of the occupied room closest to the site boundary in suburban areas away from main road traffic and industrial noise. For the duration of construction works, a daytime noise limit (07:00 am to 19:00 pm) of 70 dBA shall apply (in accordance with the requirements of BS 5228 and generally in agreement with the NRA guidelines).
- Monitoring devices will be placed on all boundaries proximate to the construction site and along routes for construction traffic.
- Vibration Limits to be applied for the duration of construction works are as set out in BS 5228-2:2009+A1:2014 (Code of Practice for Vibration Control on Construction and Open Sites) and BS 7385: 1993 (Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration). These will be checked at a minimum of twice a week.

10.6 Habitats

The Wildlife Amendment Act 2000 (S.46.1) provides that it is an offence to cut, grub, burn or destroy any vegetation on uncultivated land or such growing in any hedge or ditch from the

first of March to the 31st of August. Exemptions include the clearance of vegetation in the course of road or other construction works or in the development or preparation of sites on which any building or other structure is intended to be provided. None the less it is recommended that vegetation be removed outside of the breeding season where possible. In particular, removal during the peak-breeding season (April-June inclusive) should be avoided. Such a timeframe would also minimise the potential disturbance of breeding birds outside of the proposed development site boundary.

To prevent incidental damage by machinery or by the deposition of spoil during site works, any habitats earmarked for retention in close proximity to the proposed works will be identified and will be securely fenced or sign posted early in the construction phase. These will be clearly visible to machine operators.

Any trees shown on planning drawings to be retained will be protected for the duration of the construction activities on site and in accordance with BS 5837. Protective measures will include a protection fence erected beyond the branch spread of the trees and no construction activities will take place within the protective barrier save for perimeter fencing along the site boundaries. Tree felling and clearing of vegetation shall take place out of bird nesting season.

The protective fencing is to coincide, as far as is practical, with the root protection area (RPA), unless otherwise agreed.

The following measures are particularly important:

- Materials are never to be stacked within the root spread of the tree;
- No oil, tar, bitumen, cement or other material is to be allowed to contaminate the ground;
- No fires shall be lit beneath or in close proximity to the tree canopy;
- Trees to be retained should not be used as anchorages for equipment or for removing stumps
- Root Protection Area (RPA) Outside tree canopy dripline roots or other trees, or for other purposes;
- No notices, telephone cables or other services should be attached to any part of the tree;
- Cement mixing should not be carried out within the canopy/protected area of the tree;
- Rails clamped securely to posts
- Soil levels are to be maintained as existing within the root spread of the tree. Any alteration to soil levels in an area up to one and a half times the diameter of the tree canopy must be agreed with the ER/Architect.

Disturbed areas will be seeded or planted using appropriate native grass or species native to the areas where necessary.

10.7 Bats

During the site works, general mitigation measures for bats will follow the National Road Authority's '*Guidelines for the Treatment of Bats during the Construction of National Road Schemes'* NRA (2005c) and *'Bat Mitigation Guidelines for Ireland: Irish Wildlife Manuals, No. 25'* (Kelleher, C. & Marnell, F. (2006)). These documents outline the requirements that will be met in the pre-construction (site clearance) stage to minimise negative effects on roosting

bats, or prevent avoidable effects resulting from significant alterations to the immediate landscape.

One Common Pipistrelle was recorded emerging from the coach house which will be retained. The contractor will take all required measures to ensure works do not harm individuals by altering working methods or timing to avoid bats, if necessary. The following mitigation measures will be implemented:

- As one bat was recorded within the coach house structure the applicant will apply for a derogation licence from NPWS prior to the commencement of any works on the coach house. Works will only proceed under the conditions specified by a derogation licence.

- Bat boxes will be erected under ecological supervision to provide alternative roosting habitat prior to the commencement of works on the building. It is proposed that eight bat boxes will be located on mature trees along the site boundary. (https://www.wildcare.co.uk/vincent-pro-bat-box-10651.html for box proposed or similar).

- It is proposed that works on this building will be carried out during the period from April to September inclusive when summer roosting bats will not be present.

- If works are to take place within the summer period for bats then potential entrance points for bats will be carefully blocked in the period from November to March to ensure bats to not re-enter the building. The supervising ecologist will check to ensure there are no bats present, prior to the commencement of these works.

- The bat specialist will work with the contractor to ensure that crown reduction and tree removal is minimised and that trees earmarked for retention are adequately protected.

- Tree-felling and crown reduction, if required, will be undertaken in the period September to late October/early November. During this period bats are capable of flight and may avoid the risks of tree-felling if proper measures are undertaken.

- Felled trees (and tree branches) will not be mulched immediately. Such trees will be left lying several hours and preferably overnight before any further sawing or mulching. This will allow any bats within the tree to emerge and avoid accidental death. The bat specialist will be on-hand during felling operations to inspect felled trees for bats. If bats are seen or heard in a tree that has been felled, work will cease and the local NPWS Conservation Ranger will be contacted.

- Tree will be retained where possible and no ‘tidying up’ of dead wood and spilt limbs on tree specimens will be undertaken unless necessary for health and safety.

- Treelines and woodland outside the proposed development area but adjacent to it and thus at risk, will be clearly marked by a bat specialist to avoid any inadvertent damage.

- If bats are recorded by the bat specialist within any vegetation or structure on site i.e. trees, or walls to be removed or impacted on, no works will proceed without a relevant derogation licence from the NPWS.

- External lighting should be kept to a minimum during construction and operation, at locations where it is likely to disturb bats, and where possible will follow the *Bat Conservation Ireland Lighting Guidelines and the Bat Conservation Trust 'Bats and artificial lighting in the UK' 2018 Guideline*s, if applicable.

- No white light should be used along peripheral habitats i.e. on the western site boundary towards the woodland/Glashaboy River, as this has the greatest impact on bats. Low pressure sodium lights have a minimum impact on bats. Lighting that has little or no UV content have the least impact on bats.

- It is important to maintain Dark Zones for foraging bats in areas where lighting is not necessary. This is particularly important along linear habitats such as treelines and hedgerows. However, where lighting is required, this lighting should be placed at a minimum height using the lowest lux value permitted for health and safety.

- The lighting will be directionally focused, onto roads and pedestrian areas to provide a safe means of traversing the development, with no spillage of light to adjoining habitats. To reduce light spillage from luminaries, lights that are designed not to emit light at angles greater than 70˚ from the vertical plane should be used. Other designs to luminaires to help reduce light spillage and to direct light to the intended area only are by using accessories such as hoods, cowls, louvres and shields.

10.8 Air Quality

Construction works will be carried out in such a way as to limit the emissions to air of pollutants (particularly dust and fine particles (PM10)), employing Best Practicable Means. The site will be managed in accordance with the CWMP to minimise the potential effects on air quality from construction. Monitoring will be undertaken throughout the construction period to enable proactive management of dust and PM10 levels. Wind speed and direction will be included in the monitoring.

10.9 Invasive species

To prevent Japanese Knotweed from outside the site being inadvertently being brought into the site, the contractor will be required to inspect vehicles before using them on site, and will pay particular attention to caterpillar tracks and where trucks and dumpers are stowed.

The supplier of fill will be required to provide a guarantee that the fill to be imported does not contain knotweed. In addition, the fill will be inspected for signs of knotweed, prior to importation to site. The UK Environmental Agency's publication *Managing Japanese knotweed on development sites - The Knotweed Code of Practice* (EA 2013), states that inspection of topsoil brought into the site, should be carried out using the guidance in appendix I-IV of the code BS 3882:2007 '*The British Standard Specification for topsoil and requirements for use*'. This Standard was replaced subsequently by BS3882:2015 *Specification for Topsoil.* The inspection of fill will be carried out according to this Standard.

Since invasive species spread quickly, should construction works be carried out more than 12 months following the current site surveys, a pre-construction survey will be undertaken to identify the extent of invasive species at that time. The survey will be undertaken by a suitably qualified ecologist.

Non-third schedule invasive species (Himalayan Honeysuckle, Winter Heliotrope and Buddleia) will be removed from within the planning boundary via mechanical movement and herbicide treatment if required.

11. Conclusions

Overall, the development will impact primarily on habitats of low to high local importance which have developed on previously disturbed ground. There will also be a loss of habitats which are used as foraging grounds for common bird and mammal species. There will be a small loss of scrub can be used as nesting habitats for common bird species. Woodland will be retained. No trees suitable as bat roosting habitat were identified within the site. No impact on aquatic habitats is predicted. No particular difficulties in the effective implementation of the prescribed mitigation measures have been identified. No impact from the spread of invasive species will occur.

Design measures and mitigation measures to protect water quality will ensure that no adverse impact on designated sites (SACs, SPAs or pNHAs) and/or their conservation objectives will occur.

During construction, there will be increased noise and disturbance which could potentially impact on birds and mammals including Otter and bat species. There is likely to be a loss of bat foraging habitat on the boundary of the site due to operational lighting. However, given the small numbers of bats which forage at the site the impact on this will not be significant. Mitigation measures including the provision of bat boxes will minimise any impacts on roosting bats. Given the availability of alternative nesting habitat in the vicinity, the impact on nesting birds is likely to be slight and short-term. With the exception of localised impacts and short-term impacts during construction, no significant impacts on fauna are envisaged.

References

CIRIA (2001). Control of water pollution from construction sites. E. Murnane, A. Heap, A. Swain (eds).

Collins, J. 2016 Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn).

Curtis, T.G.F.; McGough, H.N. (1988) The Irish Red Data Book - 1 Vascular Plants [400 KB]

EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements. Environmental Protection Agency.

EPA (2003) Advice notes on current practice in the preparation of Environmental Impact Statements. Environmental Protection Agency.

EPA (2015) Advice Notes for Preparing Environmental Impact Statements Draft September 2015

EPA (2015) Revised Guidelines on the Information to be Contained in Environmental Impact Statements (Environmental Protection Agency, draft September 2015);

Fossitt J A (2000) A Guide to Habitats in Ireland. The Heritage Council, Kilkenny

Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods - a Manual of Techniques for Key UK Species.* RSPB: Sandy.

Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 – 2026". Irish Birds 43: 1-22

Haffner M, Stutz HP (1986) Abundance of Pipistrellus pipistrellus and Pipistrellus kuhlii foraging at street-lamps. Myotis 23-24: 167–168.

Heritage Council, 2011. Best Practice Guidance for Habitat Survey and Mapping

IEEM (2006) Guidelines for ecological impact assessment in the United Kingdom.

Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. *Irish Wildlife Manuals*, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Lundy, M.G., Aughney, T., Montgomery, W.I., & Roche, N., (2011) Landscape conservation for Irish bats & species specific roosting characteristics. Bat Conservation Ireland.

NRA (2005a). Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes. National Road Authority.

NRA (2005b). Guidelines for treatment of bats during construction of National Road Schemes. National Road Authority

NRA (2008) Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes. National Road Authority

NRA (2009). Guidelines for assessment of ecological impacts of National Road Schemes. National Road Authority.

Speakman JR (1991) Why do Insectivorous Bats in Britain Not Fly in Daylight More Frequently? Funct Ecol 5: 518–524.

Stace, C.A. (2019). New flora of the British isles 4th edition.

Stone EL, Jones G, Harris S (2009) Street lighting disturbs commuting bats. Curr Biol 19: 1123– 1127.

SWRDB (2018). Fish in Rivers Factsheet 2018. Glashaboy catchment.

Webb, D.A., Parnell, J. & Doogue, D. (1996) An Irish flora. Seventh edition. Dundalgan Press (W. Tempest), Dundalk.

Wyse Jackson, Úna FitzPatrick, Edwina Cole, Matthew Jebb, Damian McFerran, Micheline Sheehy Skeffington & Mark Wright (2016) Ireland Red List No.10: Vascular Plants

Appendices

Appendix 1. NRA 2009 Guidelines

Table 1: Examples of valuation at different geographical scales

Ecological valuation: Examples

International Importance:
 	
• 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
• Proposed Special Protection Area (pSPA).
• Site that fulfills the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
• Features essential to maintaining the coherence of the Natura 2000 Network.[4]
• Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
• Resident or regularly occurring populations (assessed to be important at the national level)5 of the following:
  ○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
  ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
• Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
• World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
• Biosphere Reserve (UNESCO Man & The Biosphere Programme).
• Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
• Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
• Biogenetic Reserve under the Council of Europe.
• European Diploma Site under the Council of Europe.
• Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).[6]

National Importance:
 	
• Site designated or proposed as a Natural Heritage Area (NHA).
• Statutory Nature Reserve.
• Refuge for Fauna and Flora protected under the Wildlife Acts.
• National Park.
• Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
• Resident or regularly occurring populations (assessed to be important at the national level)7 of the following:
  ○ Species protected under the Wildlife Acts; and/or
  ○ Species listed on the relevant Red Data list.
• Site containing 'viable areas'[8] of the habitat types listed in Annex I of the Habitats Directive.

County Importance:
 	
• **Area of Special Amenity.[9]**
• **Area subject to a Tree Preservation Order.**
• **Area of High Amenity, or equivalent, designated under the County Development Plan.**
• **Resident or regularly occurring populations (assessed to be important at the County level)[10] of the following:**
  ○ **Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;**
  ○ **Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;**
  ○ **Species protected under the Wildlife Acts; and/or**
  ○ **Species listed on the relevant Red Data list.**
• **Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.**

- **County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, 11 if this has been prepared.**
- **Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.**
- **Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.**

Local Importance (higher value):

- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
- Resident or regularly occurring populations (assessed to be important at the Local level)12 of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value):

- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;
- Sites or features containing non-native species that are of some importance in maintaining habitat links.

4 See Articles 3 and 10 of the Habitats Directive.
5 It is suggested that, in general, 1% of the national population of such species qualifies as an internationally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.
6 Note that such waters are designated based on these waters' capabilities of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*).
7 It is suggested that, in general, 1% of the national population of such species qualifies as a nationally important population. However, a smaller population may qualify as nationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.
8 A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).
9 It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.
10 It is suggested that, in general, 1% of the County population of such species qualifies as a County important population. However, a smaller population may qualify as County important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.
11 BAP: Biodiversity Action Plan
12 It is suggested that, in general, 1%of the local population of such species qualifies as a locally important population. However, a smaller population may qualify as locally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle