Enviroguide CONSULTING

ECOLOGICAL IMPACT ASSESSMENT REPORT

FOR

PROPOSED WAREHOUSE DEVELOPMENT

AT

KINGSWOOD ROAD,
CITYWEST BUSINESS PARK,
DUBLIN 24

ON BEHALF OF

Rockface Developments Ltd.

Prepared by
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1 INTRODUCTION

Enviroguide Consulting was commissioned by Rockface Developments Ltd. to carry out an Ecological Impact Assessment for a Proposed Development at Kingswood Road, Citywest Business Park, Dublin 24.

This Ecological Impact Assessment (EcIA) assesses the potential effects of the Proposed Development on habitats and species; particularly those protected by National and International legislation or considered to be of particular nature conservation importance. This report will describe the ecology of the Proposed Development area, with emphasis on habitats, flora and fauna, and will assess the potential effects of the Construction and Operational Phases of the Proposed Development on these ecological receptors. The report follows Guidelines for Ecological Impact Assessment in the UK and Ireland, by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018).

1.1 Quality assurance and competence

Synergy Environmental Ltd., T/A Enviroguide Consulting, is wholly Irish Owned multi-disciplinary consultancy specialising in the areas of the Environment, Waste Management and Planning. Enviroguide staff members are highly qualified in their field. Professional memberships include the Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association and Chartered Institute of Ecology and Environmental Management (CIEEM).

All surveying and reporting has been carried out by qualified and experienced ecologists and environmental consultants. Shannen O'Brien, Ecologist with Enviroguide undertook the ecological surveys and desktop research for this report.

Shannen O'Brien has a B.A. in Zoology from Trinity College Dublin and a M.Sc. Hons. in Wildlife Conservation and Management from University College Dublin, and has experience in desktop research, report writing, and literature scoping-review, as well as practical field and laboratory experience (Pollinator surveying, sampling and identification, habitat surveying, invasive species surveying, etc.). Shannen has prepared Stage I and Stage II Appropriate Assessment Reports, Invasive Species Surveys, Ecology Statements, and Ecological Impact Assessments (EcIA).

2 RELEVANT LEGISLATION

An Ecological Impact Assessment (EcIA) is a process of identifying, quantifying, and evaluating potential effects of development-related or other actions on habitats, species and ecosystems (CIEEM, 2016). The Proposed Development is a sub-threshold for an Environmental Impact Assessment (EIA) under the Planning and Development Regulations 2011-2018.

When an EcIA is undertaken as part of an EIA process it is subject to the EIA Regulations (under the EU Planning and Development [Environmental Impact Assessment] Regulations 2001-2018). An EcIA is not a statutory requirement, however it is a best practice evaluation process. This EcIA has been undertaken to support and assess the Proposed Development planning application and assesses the potential impacts that the Proposed Development may have on the ecology of the site and its environs. Where potential for a risk to the environment is identified, mitigation measures are proposed on the basis that by deploying these mitigation measures the risk is eliminated or reduced to an insignificant level. This EcIA is provided to assist the Competent Authority with its decision making in respect of the Proposed Development.

2.1 National Legislation

2.1.1 Wildlife Act 1976 and amendments

The Wildlife Act 1976 was enacted to provide protection to birds, animals, and plants in Ireland and to control activities which may have an adverse impact on the conservation of wildlife. With regard to the listed species, it is an offence to disturb, injure or damage their breeding or resting place wherever these occur without an appropriate licence from the National Parks and Wildlife Service (NPWS). This list includes all wild birds along with their nests and eggs. Intentional destruction of an active nest from the building stage up until the chicks have fledged is an offence. This includes the cutting of hedgerows from the 1st of March to the 31st of August. The act also provides a mechanism to give statutory protection to Natural Heritage Areas (NHAs). The Wildlife Amendment Act 2000 widened the scope of the Act to include most species, including the majority of fish and aquatic invertebrate species which were excluded from the 1976 Act.

The current list of plant species protected by Section 21 of the Wildlife Act, 1976 (and amendments) is set out in the Flora (Protection) Order, 2015 (S.I. No. 356/2015). The Flora (Protection) Order affords protection to several species of plant in Ireland, including 68 vascular plants, 40 mosses, 25 liverworts, 1 stonewort and 1 lichen. This Act makes it illegal for anyone to uproot, cut or damage any of the listed plant species and it also forbids anyone from altering, interfering, or damaging their habitats. This protection is not confined to within designated conservation sites and applies wherever the plants are found.

2.1.2 EC (Birds and Natural Habitats) Regulations 2011

The EU Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive 1992) provides protection to particular species and habitats throughout Europe. The Habitats Directive has been transposed into Irish law through the EC (Birds and Natural Habitats) Regulations 2011.

Annex IV of the EU Habitats Directive provides protection to a number of listed species, wherever they occur. Under Regulation 23 of the Habitats Directive, any person who, in regards to the listed species, "Deliberately captures or kills any specimen of these species in the wild, deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration, deliberately takes or destroys eggs from the wild or damages or destroys a breeding site or resting place of such an animal shall be guilty of an offence."

2.1.3 Invasive Species Legislation

Certain plant species and their hybrids are listed as Invasive Alien Plant Species in Part 1 of the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations* 2011 (SI 477 of 2011, as amended). In addition, soils and other material containing such invasive plant material, are classified in Part 3 of the Third Schedule as vector materials and are subject to the same strict legal controls.

Failure to comply with the legal requirements set down in this legislation can result in either civil or criminal prosecution, or both, with very severe penalties accruing. Convicted parties under the Act can be fined up to €500,000.00, jailed for up to 3 years, or both.

Extracts from the relevant sections of the regulations are reproduced below.

"49(2) Save in accordance with a licence granted [by the Department of Arts, Heritage and the Gaeltacht], *any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in anyplace* [a restricted non-native plant], *shall be guilty of an offence.*

49(3) … it shall be a defence to a charge of committing an offence under paragraph (1) or (2) to prove that the accused took all reasonable steps and exercised all due diligence to avoid committing the offence.

50(1) Save in accordance with a licence, a person shall be guilty of an offence if he or she […] offers or exposes for sale, transportation, distribution, introduction, or release—

(a) an animal or plant listed in Part 1 or Part 2 of the Third Schedule,

(b) anything from which an animal or plant referred to in subparagraph (a) can be reproduced or propagated, or

(c) a vector material listed in the Third Schedule, in any place in the State specified in the third column of the Third Schedule in relation to such an animal, plant or vector material."

2.2 International Legislation

2.2.1. EU Birds Directive

The Birds Directive constitutes a level of general protection for all wild birds throughout the European Union. Annex I of the Birds Directive includes a total of 194 bird species that are considered rare, vulnerable to habitat changes or in danger of extinction within the European Union. Article 4 establishes that there should be a sustainable management of hunting of listed species, and that any large scale non-selective killing of birds must be outlawed. The Directive

requires the designation of Special Protection Areas (SPAs) for: listed and rare species, regularly occurring migratory species and for wetlands which attract large numbers of birds. There are 25 Annex I species that regularly occur in Ireland and a total of 153 Special Protection Areas have been designated.

2.2.2. EU Habitats Directive

The Habitats Directive aims to protect some 220 habitats and approximately 1000 species throughout Europe. The habitats and species are listed in the Directives annexes, where Annex I covers habitats and Annex II, IV and V cover species. There are 59 Annex I habitats in Ireland and 33 Annex IV species which require strict protection wherever they occur. The Directive requires the designation of Special Areas of Conservation for areas of habitat deemed to be of European interest. The SACs together with the SPAs from the Birds Directive form a network of protected sites called Natura 2000.

2.2.3. Water Framework Directive

The EU Water Framework Directive (WFD) 2000/60/EC is an important piece of environmental legislation which aims to protect and improve water quality. It applies to rivers, lakes, groundwater, estuaries, and coastal waters. The Water Framework Directive was agreed by all individual EU member states in 2000, and its first cycle ran from 2009 – 2015. The Directive runs in 6-year cycles, so the second cycle ran from 2016 – 2021, and the current (third) cycle runs from 2022-2027.The aim of the WFD is to prevent any deterioration in the existing status of water quality, including the protection of good and high water quality status where it exists. The WFD requires member states to manage their water resources on an integrated basis to achieve at least 'good' ecological status, through River Basin Management Plans (RBMP), by 2027.

2.2.4. Bern and Bonn Convention

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) was enacted to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was introduced to give protection to migratory species across borders in Europe.

2.2.5. Ramsar Convention

The Ramsar Convention on Wetlands is an intergovernmental treaty signed in Ramsar, Iran, in 1971. The treaty is a commitment for national action and international cooperation for the conservation of wetlands and their resources. In Ireland there are currently 45 Ramsar sites which cover a total area of 66,994 Ha.

3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Location

The Site of the Proposed Development is 2.56 Ha and located within Citywest Business Park. The Site is currently primarily comprised of a greenfield site and is bounded on the northwest by residential properties and commercial units, and along the southwest by commercial units. The northeast of the Site is abutted by Kingswood Road, while the southeast is bordered by Kingswood Avenue. The surrounding landscape is predominantly urban in nature.

3.2 Description

Rockface Developments Limited intend to apply for permission for development at a 2.56 Ha site at Kingswood Road and Kingswood Avenue, Citywest Business Campus, Dublin 24. The lands are generally bounded to the south-east by Kingswood Avenue, south-west and north-west by existing built development and to the north-east by Kingswood Road.

The development will comprise the provision of a warehouse with ancillary office and staff facilities and associated development. The warehouse will have a maximum height of 18 metres with a gross floor area of 11,691 sq m including a warehouse area (10,604 sq m), ancillary staff facilities (499 sq m) and ancillary office area (588 sq m).

The development will also include: a vehicular and pedestrian entrance to the site from Kingswood Road, a separate HGV entrance from Kingswood Avenue; 64 No. ancillary car parking spaces; covered bicycle parking; HGV parking and yards; level access goods doors; dock levellers; access gates; hard and soft landscaping; canopy; lighting; boundary treatments; ESB substation; plant; and all associated site development works above and below ground.

The incorporation of Sustainable Urban Drainage Systems (SUDS) into the design of the Proposed Development is mandatory for all new developments under the Greater Dublin Regional Code of Practice for Drainage Works. As such, the Proposed Development design entails a suite of SuDS measures. SUDS is a series of management practices and control structures that aim to mimic natural drainage. SUDS reduces flood risk, improves water quality and provides amenity through the use of permeable paving, swales, green roofs, rainwater harvesting, detention basins, ponds and wetlands[1].

3.2.1 Construction Phase

As stated in the Tree Report (Enviroguide, 2022), the Proposed Development will involve clearance of vegetation from the Site, including the removal of 37 trees with a stem diameter of more than 100mm and approximately 100 trees with a stem diameter of less than 100mm.

[1] https://www.dublincity.ie/dublin-city-development-plan-2016-2022/9-sustainable-environmental-infrastructure/95-policies-and-objectives/954-surface-water-drainage-and

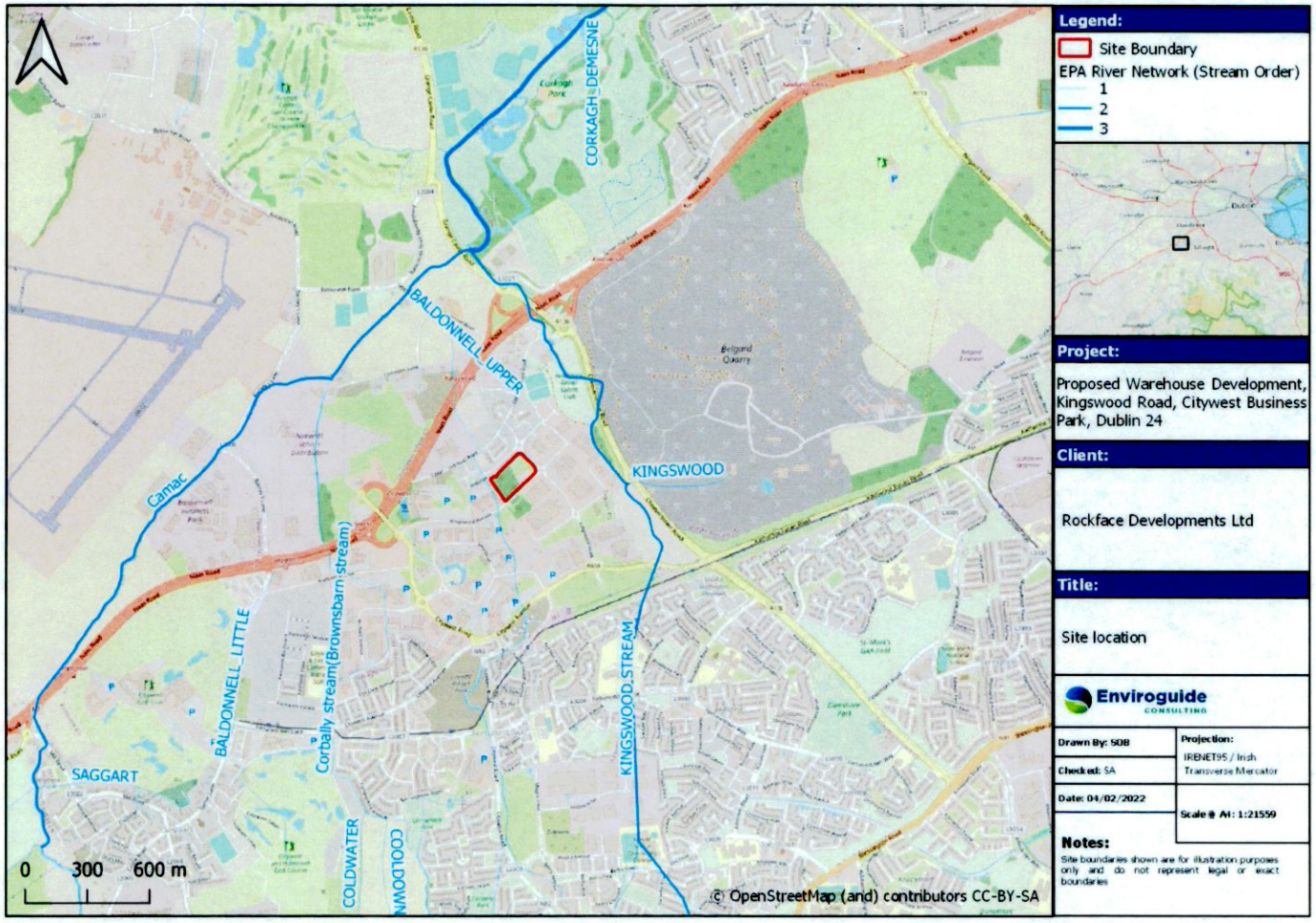

FIGURE 1. SITE LOCATION.

4 METHODOLOGY

This section details the steps and methodology employed to undertake an Ecological Impact Assessment of the Proposed Development.

4.1 Scope of Assessment

The specific objectives of the study were to:

- Undertake baseline ecological surveys and evaluate the nature conservation importance of the Site of the Proposed Development.
- Identify and assess the direct, indirect, and cumulative ecological implications or impacts of the Proposed Development during its lifetime; and
- Where possible, propose mitigation measures to remove or reduce those impacts at the appropriate stage of development.

4.2 Desk Study

A desktop study was carried out to collate and review available information, datasets and documentation sources pertaining to the site's natural environment. The desktop study relied on the following sources:

- Information on species records and distributions, obtained from the National Biodiversity Data Centre (NBDC) at *www.maps.biodiversityireland.ie*.
- Information on waterbodies, catchment areas and hydrological connections obtained from the Environmental Protection Agency (EPA) at *www.gis.epa.ie*.
- Information on bedrock, groundwater, aquifers and their statuses, obtained from Geological Survey Ireland (GSI) at *www.gsi.ie* ;
- Information on the network of designated conservation sites, boundaries, qualifying interests and conservation objectives, obtained from the National Parks and Wildlife Service (NPWS) at *www.npws.ie* ;
- Satellite imagery and mapping obtained from various sources and dates including Google, Digital Globe and Ordnance Survey Ireland.
- Information on the existence of permitted developments, or developments awaiting decision, in the vicinity of the Proposed Development from South Dublin County Council available at: https://sdublincoco.maps.arcgis.com/apps/webappviewer/index.html?id=004b5a1a557a4c1a91b4629923f9d4b7
- Information on the extent, nature and location of the Proposed Development, provided by the applicant and/or their design team.
- The current conservation status of birds in Ireland taken from Gilbert et al. (2021).
- The pollinator friendly planting code provided by The All-Ireland Pollinator Plan (2015-2020 and 2021-2025) available at www.pollinators.ie
- Connecting with Nature – Draft Biodiversity Action Plan for South Dublin County 2020-2026
- South Dublin County Council Development Plan 2016-2022

A comprehensive list of all the specific documents and information sources consulted in the completion of this document is provided in Section 11, References.

4.3 Field surveys

4.3.1 Habitat Surveys

Habitat surveys were carried out at the Site on the 19th of January 2022 and the 20th of June 2022. Habitats were categorised according to the Heritage Council's '*A Guide to Habitats in Ireland*' (Fossitt, 2000) to level 3. The habitat mapping exercise had regard to the 'Best Practice Guidance for Habitat Survey and Mapping' (Smith et al., 2010) published by the Heritage Council. Satellite imagery was used together with GPS to accurately enable field navigation. Habitat categories, characteristic plant species, invasive species and other ecological features were recorded.

4.3.2 Bat Surveys

Bat habitat assessment surveys were carried out on Site of the Proposed Development on the 19th of January 2022 and the 20th of June 2022 along with the overall habitat survey.

4.3.3 Bird Surveys

Bird surveys were completed on the 19th of January 2022 and the 20th of June 2022. All birds encountered on Site, through visual and/or audio means, were recorded during this survey.

4.3.4 Mammal Surveys

Mammal surveys of the Site were carried out in conjunction with the habitat surveys. The Site was examined for tracks and signs of mammals. The habitat types recorded throughout the survey area were used to assist in identifying the fauna considered likely to utilise the area.

4.3.5 Invasive Species Surveys

The Site was assessed for the presence of invasive plant species during the habitat surveys undertaken.

4.4 Consultation

No consultation was undertaken as part of this Ecological Impact Assessment.

4.5 Assessment

The value of the ecological resources, i.e., the habitats and species present or potentially present, was determined using the ecological evaluation guidance given in the National Roads Authority's Ecological Assessment Guidelines (NRA, 2009b), presented in Appendix I. This evaluation scheme, with values ranging from locally important to internationally important, seeks to provide value ratings for habitats and species present that are considered ecological receptors of impacts that may ensue from a proposal. As per the NRA guidelines, impact assessment is only undertaken of key ecological receptors (KERs).

The assessment of the potential effect or impact of the Proposed Development on the identified key ecological receptors was carried out with regard to the criteria outlined in the

EPA Guideline (EPA, 2022), presented in Appendix II. These guidelines set out a number of parameters such as quality, magnitude, extent and duration that should be considered when determining which elements of the Proposed Development could constitute impact or sources of impacts.

4.6 Limitations

An extensive search of available datasets for records of rare and protected species within proximity of the Proposed Development has been undertaken as part of this assessment. However, the records from these datasets do not constitute a complete species list. The absence of species from these datasets does not necessarily confirm an absence of species in the area.

A general bat activity survey was not carried out on the Site of the Proposed Development.

5 BASELINE ECOLOGICAL CONDITIONS

5.1 Site Overview

5.1.1 Geology, Hydrology and Hydrogeology

The Site of the Proposed Development is within the *Liffey and Dublin Bay* catchment and *Liffey_SC_090* sub catchment. The closest watercourse to the Site is the Baldonnell Upper Stream 23m to the west, which flows into the River Camac 985m north of the Site. Water quality in the River Camac has been designated as *Moderate* by the EPA in 2019 (station code: RS09C020250). The River Camac flows into the River Liffey, and ultimately into Dublin Bay.

The Site is situated on the Dublin groundwater body, which is *Not At Risk* of not meeting its WFD objectives. The aquifer type within the Site boundary is a *Locally Important* (LI) aquifer on bedrock which is *Moderately Productive in Local Zones Only*. The groundwater rock units underlying the aquifer are classified as *Dinantian Upper Impure Limestones* (GSI, 2022). The level of vulnerability of the Site to groundwater contamination via human activities is *High* throughout most of the Site, with an area classed as *Extreme* within the south of the Site. The soil is classified as *Elton* and the subsoil is Limestone till (Carboniferous) (*TLs*) (EPA, 2022).

5.2 Designated Sites

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs). It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected sites throughout the European Community. SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the qualifying interests of the sites; from these the conservation objectives of the site are derived.

Natural Heritage Areas (NHAs) are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with SAC and/or SPA sites. Although many NHA designations are not yet fully in force under this legislation (referred to as 'proposed NHAs' or pNHAs), they are offered protection in the meantime under planning policy which normally requires that planning authorities give recognition to their ecological value.

Table 1 below presents details of the designated sites within a 15km radius of the Proposed Development. In addition, the potential for connectivity with designated sites at distances of greater than 15km from the Development was also considered in this initial assessment, and there is potential connectivity between the Proposed Development Site and two European Sites located at a distance greater than 15km from the Proposed Development based on the S-P-R model.

The result of this preliminary screening concluded that there is a total of 6 SACs, 4 SPAs and 15 pNHAs located within the Zone of Influence of the Proposed Development Site. The distances to each site listed are taken from the nearest possible point of the Proposed Development Site boundary to nearest possible point of each European site or pNHA. In addition, Dublin Bay is designated as a UNESCO Biosphere[2]. Dublin Bay Biosphere contains three different zones, which are managed in different ways:

- The core zone of Dublin Bay Biosphere comprises 50km² of areas of high natural value. Key areas include the Tolka and Baldoyle Estuaries, Booterstown Marsh, Howth Head, North Bull Island, Dalkey Island and Ireland's Eye.
- The buffer zone comprises 82km² of public and private green spaces such as parks, greenbelts and golf courses, which surround and adjoin the core zones.
- The transition zone comprises 173km² and forms the outer part of the Biosphere. It includes residential areas, harbours, ports and industrial and commercial areas.

TABLE 1. DESIGNATED SITES WITHIN THE ZONE OF INFLUENCE (15KM) OF THE PROPOSED DEVELOPMENT, POTENTIAL PATHWAYS BETWEEN THE PROPOSED DEVELOPMENT SITE AND THE DESIGNATED SITES. SITES THAT HAVE BEEN SCREENED INTO THIS ECIA FOR FURTHER ASSESSMENT ARE SHADED IN GREEN.

Site Name & Code (Receptor)	Distance to Proposed Development	Potential Pathway to receptor
Special Area of Conservation		
Glenasmole Valley SAC (001209)	5.2km	No – Refer to AA Screening Report accompanying this application.
Wicklow Mountains SAC (002122)	6.9km	
Rye Water Valley/Carton SAC (001398)	8.8km	
Red Bog, Kildare SAC (000397)	13.1km	
South Dublin Bay SAC (000210)	14.3km	
North Dublin Bay SAC (000206)	*>15km*	
Special Protection Area		
Wicklow Mountains SPA (004040)	10.1km	No – Refer to AA Screening Report accompanying this application.
Poulaphouca Reservoir SPA (004063)	13.3km	
South Dublin Bay and River Tolka Estuary SPA (004024)	14.3km	
North Bull Island SPA (004006)	*>15km*	
Proposed Natural Heritage Area		
Lugmore Glen (001212)	2.7km	No – there is no hydrological connection with these pNHAs and the intervening distances between the Site and the pNHAs are sufficient to exclude the possibility of significant effects on the pNHAs arising from: emissions of noise, dust, pollutants and/or vibrations emitted from the Site during the Construction Phase;
Grand Canal (002104)	3.7km	
Slade Of Saggart And Crooksling Glen (000211)	3.7km	

[2] A biosphere is a special designation awarded by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) but managed in partnership by communities, NGOs and local and national governments (https://www.dublinbaybiosphere.ie/).

Site Name & Code (Receptor)	Distance to Proposed Development	Potential Pathway to receptor
Dodder Valley (000991)	4.7km	increased traffic volumes during the Construction and Operational Phase and associated emissions; potential increased lighting emitted from the Site during Construction and Operational Phase; and increased human presence at the Site during Construction and Operational Phase.
Glenasmole Valley (001209)	5.2km	
Liffey Valley (000128)	7.0km	
Royal Canal (002103)	8.7km	
Rye Water Valley/Carton (001398)	8.8km	
Kilteel Wood (001394)	9.6km	
Fitzsimon's Wood (001753)	12.5km	
Red Bog, Kildare (000397)	12.9km	
Poulaphouca Reservoir (000731)	13.2km	
Booterstown Marsh (001205)	14.6km	
North Dublin Bay (000206)	14.1km	No - There is an indirect hydrological connection to Dublin Bay via surface water discharges to the surrounding surface water network and the River Camac during the Construction and Operational Phases and discharges from Ringsend WwTP during the Operational Phase. However, the potential for surface water generated at the Site of the Proposed Development to reach Dublin Bay and cause significant effects, during the Construction and Operational Phases, is excluded due to: • The distance and consequent potential for dilution in the River Camac, River Liffey and Dublin Bay. Surface water discharges would have to travel over 20km along the River Camac and River Liffey before discharging into Dublin Bay. • The potential for dilution in the surface water network during heavy rainfall events. Also, the potential for foul water generated at the Site of the Proposed Development to reach Dublin Bay and cause significant effects, during Operational Phase, is excluded due to: • It is considered that effects on marine biodiversity and the European Sites within Dublin Bay from the current operation of Ringsend WwTP are unlikely (see section 8.1.3 for more details). • The main area of dispersal of the treated effluent from Ringsend WwTP is in the Tolka Basin and around North Bull Island. South Dublin Bay is unaffected by the effluent from the plant (Irish Water, 2018). • The increase of the Population Equivalent (PE) load at the facility as a result of the Proposed Development, assuming each PE unit was not previously supported by the WwTP, is considered to be an insignificant increase in terms of the overall scale of the facility. The increased load does not have the capacity to alter the effluent released from the WwTP to such an extent as to result in likely significant effects on European sites in Dublin Bay.
South Dublin Bay (000210)	14.3km	

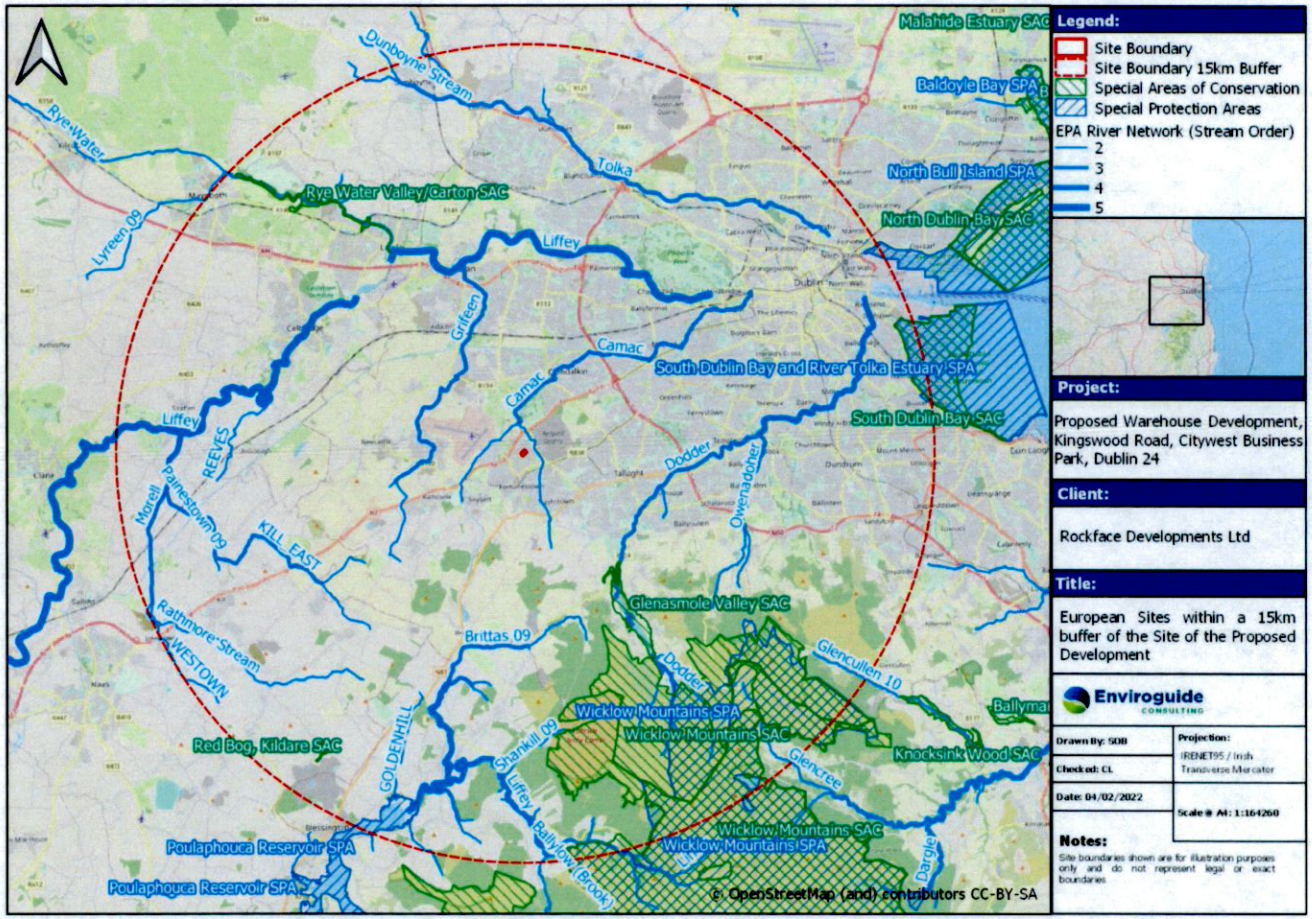

FIGURE 2. EUROPEAN SITES WITHIN 15KM OF THE PROPOSED DEVELOPMENT SITE. 1ST ORDER STREAMS ARE NOT SHOWN ON THIS MAP.

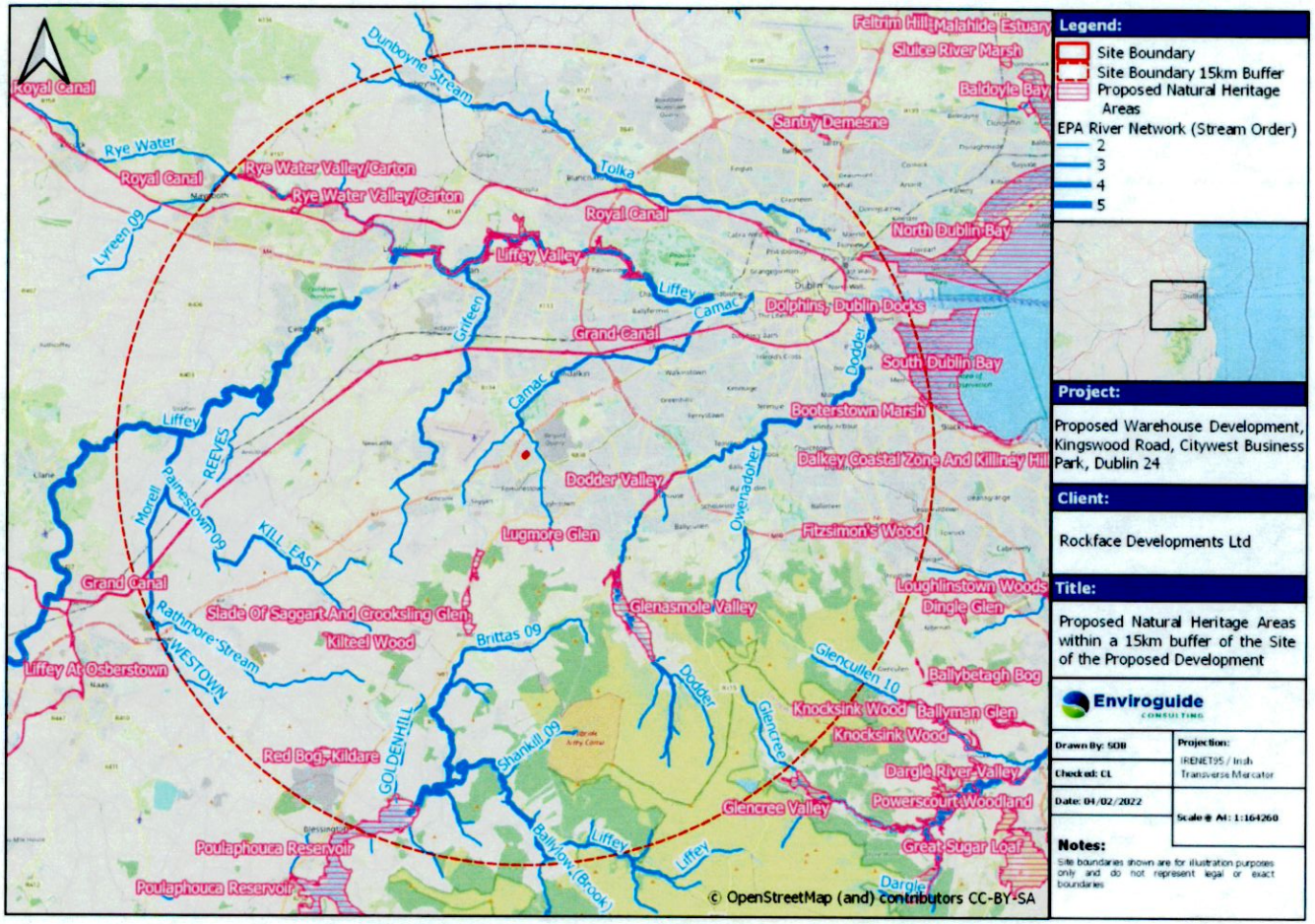

FIGURE 3. PROPOSED NATURAL HERITAGE AREAS WITHIN 15KM OF THE PROPOSED DEVELOPMENT SITE. 1ST ORDER STREAMS ARE NOT SHOWN ON THIS MAP.

5.3 Desk Study

5.3.1 Species and Species Groups

The Site of the Proposed Development is located within the Ordnance Survey Ireland National Grid 2km square O02P. Species records from the National Biodiversity Data Centre (NBDC) online database for this grid square was studied for the presence of rare or protected flora and fauna. The following records were excluded:

- Records greater than 20 years old.
- Species records with no designation or conservation status (excluding mammals and birds).

In addition, data from various sources (e.g., Inland Fisheries Ireland) were used to determine the presence of species in the vicinity of the Proposed Development. The following sections outline the results of this assessment.

5.3.1.1 Flora

Rare and Protected Flora

Species records from the NBDC online database were studied for the presence of rare or protected flora. Three records of species listed as Least Concern in the Ireland List No.8: Bryophytes (Lockhart et al., 2012) were found, namely *Bryum dichotomum*, Crimson-tuber Thread-moss *Bryum rubens*, and Silver-moss *Bryum argenteum*. These species were all recorded 1.2km north of the Site within Camac Valley camping ground. There are no records for protected bryophytes within the area[3].

Invasive Plant Species

The NBDC have records (dated within the last 20 years) of 1 *Medium Impact* invasive plant species within the 2km (O02P) grid square, namely Butterfly Bush (Table 2).

TABLE 2. INVASIVE PLANT SPECIES WITHIN THE 2KM (O02P) GRID SQUARE. THE RECORDS ARE DATED WITHIN THE LAST 20 YEARS AND ARE PROVIDED BY THE NBDC.

Name	Date of last record	Database	Legal status / Designation
Butterfly Bush *Buddleja davidii*	11/06/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	- Medium Impact Invasive

5.3.1.2 Mammals (excl. bats)

Records for terrestrial mammals were retrieved from the NBDC online database. Table 3 lists these species, their last record date and summarises their legal status/designation. Seven terrestrial mammals were recorded within the 2km grid square (O02P), three of which are native, namely Badger, Irish Hare and Red Fox, and the remaining species, Brown Rat, Grey Squirrel, Rabbit, and Greater White-toothed Shrew are invasive species. The Badger was

[3] https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e

recorded as roadkill along the R136, 500m northeast of the Site, while the Hare was observed at the Casement Aerodome, 1.6km northwest of the Site of the Proposed Development.

TABLE 3. TERRESTRIAL MAMMAL SPECIES WITHIN THE 2KM (O02P) GRID SQUARE. THE RECORDS ARE DATED WITHIN THE LAST 20 YEARS AND ARE PROVIDED BY THE NBDC.

Name	Date of last record	Database	Legal Status / Designation
Brown Rat *Rattus norvegicus*	09/10/2015	Atlas of Mammals in Ireland 2010-2015	- High Impact Invasive - Regulation S.I. 477 (Ireland)
Eastern Grey Squirrel *Sciurus carolinensis*	31/12/2012	Irish Squirrel Survey 2012	- High Impact Invasive - EU Regulation No. 1143/2014 - Regulation S.I. 477 (Ireland)
Eurasian Badger *Meles meles*	13/02/2016	Mammals of Ireland 2016-2025	- Wildlife (Amendment) Act, 2000
European Rabbit *Oryctolagus cuniculus*	23/01/2017	Mammals of Ireland 2016-2025	- Medium Impact Invasive
Greater White-toothed Shrew *Crocidura russula*	26/03/2020	Mammals of Ireland 2016-2025	- Medium Impact Invasive
Irish Hare *Lepus timidus subsp. hibernicus*	14/07/2017	Mammals of Ireland 2016-2025	- EU Habitats Directive Annex V - Wildlife (Amendment) Act, 2000
Red Fox *Vulpes vulpes*	16/08/2016	Mammals of Ireland 2016-2025	- n/a

5.3.1.3 Bats

There are 3 bat species recorded within the 2km grid square associated with the Site (O02P), namely Lesser Noctule *Nyctalus leisleri*, Pipistrelle *Pipistrellus pipistrellus sensu lato* and Soprano Pipistrelle *Pipistrellus pygmaeus*. The NBDC maps landscape suitability for bats based on Lundy et al. (2011). The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. The overall habitat suitability index for bats in the area is 39.67. The species with the highest individual suitability scores for the area encompassing the Site are Lesser Noctule *Nyctalus leisleri* and Common Pipistrelle *Pipistrellus pipistrellus*, both with 59.

5.3.1.4 Birds

A total of 9 bird species have been recorded within the 2km grid square by the NBDC. Of these, 1 is listed as *Red* and 3 are listed as *Amber* in *Birds of Conservation Concern in Ireland 2020-2026* (Gilbert et al., 2021).

Red listed species include:

Swift *Apus apus*

Amber listed species include:

Swallow *Hirundo rustica*
Coot *Fulica atra*
Sand Martin *Riparia riparia*

5.3.1.5 Fish

There were no fish species recorded within the 2km grid square by the NBDC. There are no waterbodies within the Site of the Proposed Development itself.

Atlantic salmon (*Salmo salar*) & Brown trout (*Salmo trutta*)

There are three species of salmonid associated with freshwater habitats in Ireland, namely Atlantic Salmon (*Salmo salar*), Brown Trout (*Salmo trutta*) and Arctic Char (*Salvelinus alpinus*), the latter of which is only associated with lake waterbodies in Ireland. The Atlantic salmon is listed as an Annex II species under the Habitat Directive. The River Camac was surveyed in September of 2017 and three age classes of Brown Trout (0+, 1+ and 2+) were recorded at the survey site located closest to the Site of the Proposed Development, which was the Moneenalion Commons Bridge, 945m northwest of the Site (Matson et al., 2018).

Petromyzonidae (Lamprey sp.)

There are three lamprey species native to Ireland including Sea Lamprey (*Petromyzon marinus*), River Lamprey (*Lampetra fluviatilis*) and Brook Lamprey (*Lampetra planeri*). All three species are listed under Annex II of the Habitats Directive and are protected by the Fisheries Acts 1959 to 2006. Lamprey was not recorded were recorded at the Moneenalion Commons Bridge survey site in 2017 (Matson et al., 2018).

European eel (*Anguilla anguilla*)

European eel is a red listed species[4] and are currently considered to be one of the most threatened fish species in Ireland (King *et al.* 2011). Eels were not recorded at the Moneenalion Commons Bridge survey site in 2017 (Matson et al., 2018).

5.3.1.6 Amphibians

There are no records of Common Frog *Rana temporaria* or Smooth Newt *Lissotriton vulgaris* within the 2km (O02P) grid square (NBDC: *Amphibians and reptiles of Ireland*). No suitable habitat exists for either species at the Site, with no pooling, ditches or wet grassland type habitats present. The Site is considered unsuitable for amphibian usage and therefore these species are not assessed further in this report.

5.3.1.7 Invertebrates

There are two records of protected White-clawed crayfish (*Austropotamobius pallipes*) within the 2km (O02P) grid square, both of which were sighted at the Moneenalion Bridge, 945m northwest of the Site. There are records of two *Near Threatened* and one *Data Deficient* invertebrate species.

Near Threatened

- Large Red-Tailed Bumblebee *Bombus lapidarius*
- Moss Carder-bee *Bombus muscorum*

Data Deficient

- Smeathman's Furrow Bee *Lasioglossum smeathmanellum*

[4] The status of a species is designated by the relevant authorities as Red. Amber or Green. Red list species range from vulnerable to extinct, Amber list species with unfavourable conservation status or declining population, and Green list species are those which are not currently of conservation concern.

5.3.1.8 Other species and species groups

There are no records of Common Lizard *Zootoca vivipara* within the 2km grid square (O02P). In addition, this species is associated with coastal and heathland habitats, but also locally in rural gardens, stone walls and roadside verges (King et al., 2011). The habitat at the Site of the Proposed Development is not considered suitable for this species.

5.4 Field Surveys

5.4.1 Habitats & Flora – 19th January 2022

The habitats encountered and identified at the Site of the Proposed Development have been classified and coded as per Fossitt (2000). These are described below.

- Recolonising Bare Ground (ED3)
- Buildings and Artificial Surfaces (BL3)
- Treelines (WL2)
- Amenity Grassland (improved) (GA2)

Recolonising Bare Ground ED3 was observed within south-western half of the Site, with grass recolonising this area of previously cleared vegetation, along with Cleavers (*Gallium aparine*), Speedwell (*Veronica sp.*), and Nettle (*Urtica dioica*). The north-eastern area of the Site is comprised of *Amenity Grassland (improved) GA2* with Dock (*Rumex sp.*) recorded within this habitat.

Treelines WL2 habitat is present along the southwest, northwest and northeast boundaries of the Site, with species including Ash (*Fraxinus excelsior*), Aspen (*Populus tremula*), Rowan (*Sorbus aucuparia*), Field Maple (*Acer campestre*), Willow (*Salix sp.*), Oak (*Quercus sp.*), Silver Birch (*Betula pendula*), and Bramble (*Rubus fruticosus agg.*) observed. Ivy (*Hedera helix*) was observed throughout the treelines along the southwest of the Site. *Buildings and Artificial Surfaces BL3* exists on Site in the form of a disused car park.

FIGURE 4. TREELINE WL2 HABITAT ALONG THE SOUTHWEST OF THE SITE, WITH RECOLONISING BARE GROUND ED3 AT THE SITE OF THE PROPOSED DEVELOPMENT – PHOTO TAKEN 19TH OF JANUARY 2022

FIGURE 5. BUILDINGS AND ARTIFICIAL SURFACES BL3 HABITAT AND AMENITY GRASSLAND (IMPROVED) GA2 (LEFT) ON SITE – PHOTO TAKEN 19TH OF JANUARY 2022

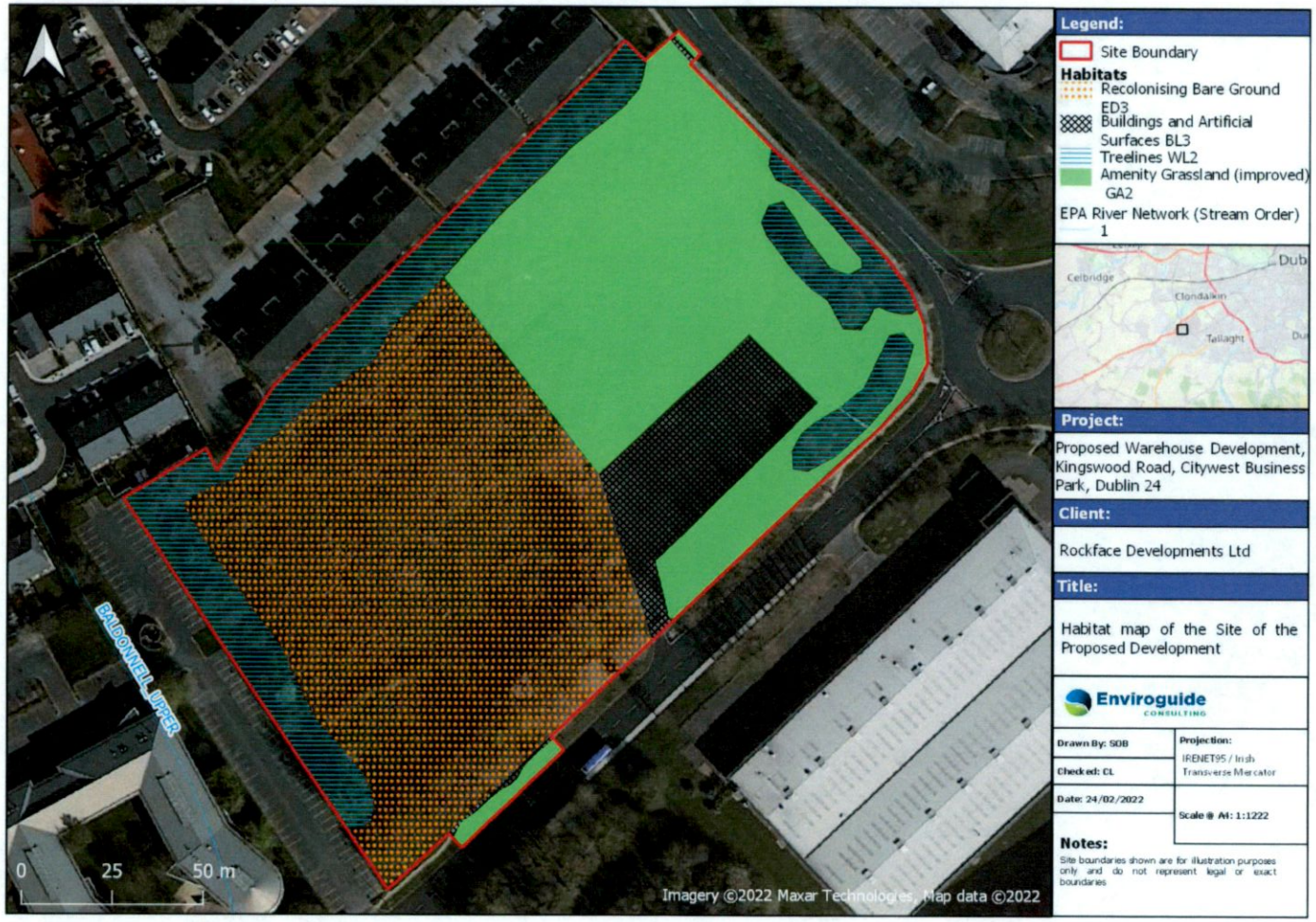

FIGURE 6. HABITATS FOUND WITHIN SITE OF THE PROPOSED DEVELOPMENT – 19TH JANUARY 2022

5.4.2 Habitats & Flora – 20th June 2022

The habitats encountered and identified at the Site of the Proposed Development have been classified and coded as per Fossitt (2000). These are described below.

- Dry Meadows and Grassy Verges (GS2)
- Recolonising Bare Ground (ED3)
- Spoil and Bare Ground (ED2)
- Buildings and Artificial Surfaces (BL3)
- Treelines (WL2)
- Amenity Grassland (improved) (GA2)

The predominant habitat on the Site of the Proposed Development is Dry Meadows and Grassy Verges GS2, which had evolved from the *Recolonising Bare Ground ED3* and much of the *Amenity Grassland (improved) GA2* habitat previously observed on Site. Species recorded within this habitat include Nettle, Dock, Ragwort (*Senecio jacobaea*), Hogweed (*Heracleum sphondylium*), Dandelion (*Taraxacum officinale agg.*), Cleavers, Poppy (*Papaver rhoeas*), and Rosebay Willowherb (*Chamaenerion angustifolium*). An area of *Recolonising Bare Ground ED3* remains within the northwest of the Site, and the *Amenity Grassland (improved) GA2* present along the northeast, east and southeast boundaries of the Site contains White Clover (*Trifolium repens*).

The *Buildings and Artificial Surfaces BL3* habitat on Site remains unchanged from the initial survey undertaken in January 2022. The area of *Treeline WL2* habitat was reduced via felling, and the species present were unaltered. An area of *Spoil and Bare Ground ED2* was observed immediately west of the derelict carpark on Site in the form of a large heap of soil.

FIGURE 7. DRY MEADOWS AND GRASSY VERGES GS2 HABITAT ON SITE, AND TREELINE WL2 HABITAT PRESENT IN THE BACKGROUND – PHOTO TAKEN 20TH OF JUNE 2022

FIGURE 8. SPOIL AND BARE GROUND ED2 ON SITE, WITH AMENITY GRASSLAND GA2 PRESENT WITHIN THE FOREGROUND – PHOTO TAKEN 20TH JUNE 2022

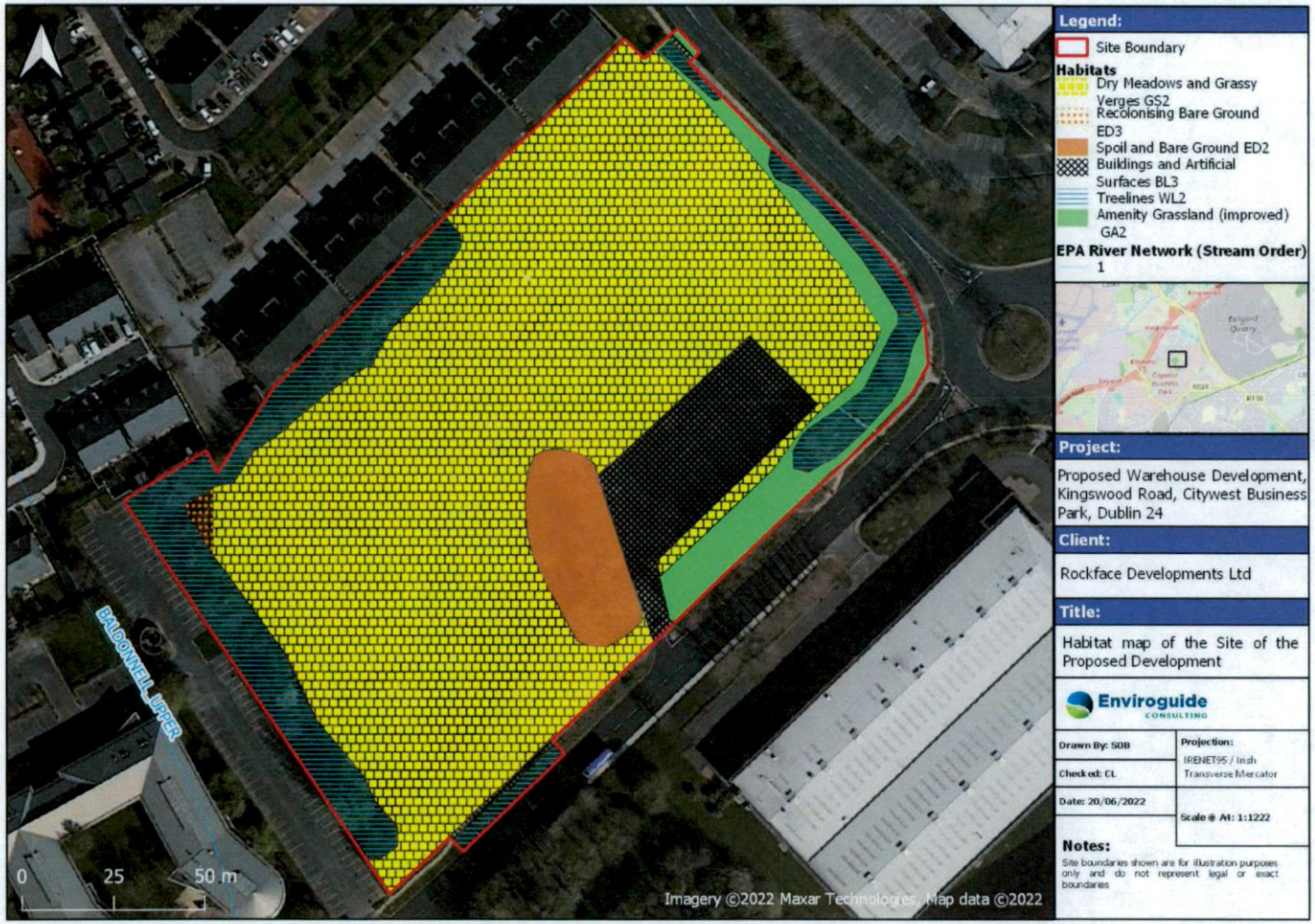

FIGURE 9. HABITATS RECORDED ON SITE OF THE PROPOSED DEVELOPMENT - 20TH OF JUNE 2022

5.4.2.1 Invasive Plant Species

Non-native species in Ireland have been assessed and assigned an impact rating of either 'High', 'Medium' or 'Low' impact based on a number of factors that determine a species' potential to become established in this country and have significant impacts (Kelly et al., 2013). Invasive species can also be rated as an 'Amber-list species', which signifies a 'Medium' impact potential or established invasive species that may pose a threat to conservation goals (Invasive Species Ireland).

No non-native/invasive species were observed on the Site of the Proposed Development on the 19th of January 2022 or the 20th of June 2022.

No species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011) including Japanese Knotweed (*Reynoutria japonica*) were recorded at the Site.

5.4.3 Bats

There are no buildings on the Site of the Proposed Development that would provide suitable roosting or foraging habitat for local bats. A number of trees on Site have areas of relatively dense Ivy cover, which has the potential to provide roosting and foraging habitat for individual bats, and the linear vegetation offers potential commuting habitat. Therefore, these trees and the Site itself has *'Low'* bat potential with regards to roosting, foraging, and commuting opportunities for bats in the vicinity.

5.4.4 Birds

The bird species recorded on site visit 19th of January 2022 are outlined in Table 4 and birds observed on the 20th of June 2022 are listed in Table 5.

TABLE 4 BIRD SPECIES OBSERVED ON SITE - 19TH OF JANUARY 2022

Species	Conservation Concern	Observations/Notes
Robin *Erithacus rubecula*	Green	One individual observed within the treeline along the northwest boundary of the Site
Wren *Troglodytes troglodytes*	Green	One individual heard calling within the treeline along the southwest boundary of the Site
Herring Gull *Larus argentatus*	Amber	Several individuals observed flying over the Site
Magpie *Pica pica*	Green	Several individuals observed flying over the Site
Blackbird *Turdus merula*	Green	One individual observed within the treeline along the southwest boundary of the Site
Goldcrest *Regulus regulus*	Amber	Two individuals observed within the treeline along the southwest boundary of the Site

TABLE 5 BIRD SPECIES OBSERVED ON SITE - 20TH JUNE 2022

Species	Conservation Concern	Observations/Notes
Robin *Erithacus rubecula*	Green	Individuals observed within and heard calling from the southwest treeline on Site
Wren *Troglodytes troglodytes*	Green	Individuals heard calling from the southwest treeline on Site
Bullfinch *Pyrrhula pyrrhula*	Green	Males and females were observed feeding on Dandelion on Site
Herring Gull *Larus argentatus*	Amber	Observed flying over the Site

Species	Conservation Concern	Observations/Notes
Magpie *Pica pica*	Green	Individuals observed foraging within the meadow and treeline habitats on Site
Blackbird *Turdus merula*	Green	A number of males and females observed within the meadow and treeline habitats on Site
Goldcrest *Regulus regulus*	Amber	Individuals heard calling from the southwest treeline on Site

5.4.5 Mammals (excl. bats)

No mammals were recorded within the Site of the Proposed Development during either of the surveys carried out on Site. As the Site is within a highly urbanised setting, and it was noted that people walked their dogs through the Site, both on and off a leash, it is unlikely that wild mammal species would frequently utilise the Site of the Proposed Development, other than as commuting habitat. Urbanised species such a Fox (*Vulpes vulpes*) or Rat (*Rattus sp.*) may forage within or commute through habitats on Site.

5.5 Designated sites, habitat and species evaluation

Fauna which have the potential to utilise habitat within the immediate area of the Proposed Development, or for which records exist in the wider area, have been evaluated below in Table 6 for their conservation importance. In addition, designated sites and habitats have been evaluated. This evaluation follows the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009a). The rationale behind these evaluations is also provided. The term 'ecological receptors' is used when impacts upon them are likely.

TABLE 6. EVALUATION OF DESIGNATED SITES, HABITATS AND FAUNA RECORDED WITHIN THE SURROUNDING AREA.

Designated Sites/Species/Habitats	Evaluation	Key Ecological Receptor (KER)	Rationale
Designated Sites			
SACs & SPAs	International Importance	No	Significant effects on Natura 2000 sites ruled out in AA Screening.
pNHAs	National Importance	No	Refer to Table 1
Dublin Bay Biosphere	International Importance	No	No significant hydrological connection or otherwise to Dublin Bay Biosphere
Habitats			
Recolonising Bare Ground (ED3)	Local importance (lower value)	No	Anthropogenically disturbed habitat of low biodiversity value.
Spoil and Bare Ground (ED2)	Local importance (lower value)	No	Man-made habitat of low biodiversity value.
Dry Meadows and Grassy Verges (GS2)	Local importance (lower value)	No	Low-Moderate diversity grassland, present within the environs surrounding the Site of the Proposed Development
Buildings and Artificial Surfaces (BL3)	Local importance (lower value)	No	Man-made habitat of negligible biodiversity value.
Treelines (WL2)	Local importance (lower value)	No	This semi-mature habitat may offer limited nesting and commuting habitat for local wildlife, however this habitat is widely present throughout the surrounding business park.
Amenity Grassland (improved) (GA2)	Local importance (lower value)	No	Low diversity habitat of low biodiversity value.
Fauna			
Eurasian Badger *Meles meles*	Local importance (lower value)	No	No suitable habitat for this species was recorded on Site, nor was there evidence of the species recorded on Site.
Irish Hare *Lepus timidus subsp. hibernicus*	Local importance (lower value)	No	No evidence of the species was recorded on Site and there is no suitable habitat for this species on Site.
Red Fox *Vulpes vulpes*	Local importance (lower value)	No	This species is not considered to be of conservation concern, and therefore is not assessed further in this report.
Bat Assemblage	Local importance (lower value)	No	The bat potential of the Site was deemed to be '*Low*'.
Bird Assemblage	Local importance (lower value)	No	Several bird species were recorded utilising the Site on the 19th of January.
Amphibian Assemblage	Local importance (lower value)	No	No suitable habitat recorded on Site.
Aquatic Fauna	Local importance (lower value)	No	A weak hydrological connection to the River Camac will exist during the Construction and Operational Phases of the Proposed Development via surface water discharge. A series of best practice measures to protect the surface water network surrounding the

Designated Sites/Species/Habitats	Evaluation	Key Ecological Receptor (KER)	Rationale
			Site during the Construction Phase have been outlined in the associated AA Screening. The contribution to overall surface waterflows from the Proposed Development to the existing surface water flow from the wider Citywest Development during the Operational Phase will be minimal. Operational Phase surface water flows will be managed via a series of SUDS measures.

6 Potential Impacts of the Proposed Development

As per the relevant guidelines, likely significant effects have been assessed for Key Ecological Receptors only, as listed in Table 6. An impact is considered to be significant if it is predicted to affect the integrity or conservation status of a KER at a given geographical scale. As no KER(s) were recorded for the Site of the Proposed Development, potential impacts to local wildlife that may infrequently utilise the Site or are linked to the Site via hydrological connections are predicted below. All impacts are described in the absence of mitigation.

6.1 Construction Phase

6.1.1 Impacts on fauna

6.1.1.1 Bats

Noise and night-time lighting generated during the Construction Phase has the potential to cause *negative, short-term, slight impacts* in the form of disturbance to mammals at a local level, potentially including bats should they roost in the surrounding landscape.

6.1.1.2 Birds

There will be some loss of foraging, nesting, and commuting habitat for birds at the Site of the Proposed Development through the removal of trees and grassland habitat, and disturbance of species during the Construction Phase is possible. This could have a *negative, permanent, slight impact* on birds in the locality.

The increased noise and dust levels associated with the Construction Phase of the Proposed Development may have the potential to cause *negative, short-term, slight impacts* to local bird populations.

6.1.1.3 Aquatic Fauna

Surface water discharges associated with the Construction Phase of the Proposed Development may have the potential to cause *negative*, *short-term*, *slight* impacts to aquatic fauna within the River Camac in the absence of suitable mitigation. There is an indirect hydrological link to the River Camac via the surface water drainage system.

6.2 Operational Phase

6.2.1 Impacts on Fauna

6.2.1.1 Bats

During the Operational Phase, there is potential for disturbance to bats utilising the Site in general through light pollution during the Operational Phase. Given the urban context of the Site, this could have a *negative, permanent, slight* impact on bats in the locality. In addition, there is potential for a *negative, permanent, slight* impact on bats in the locality through the loss of foraging resources.

6.2.1.2 Birds

No significant impacts on birds are anticipated during the Operational Phase.

6.2.1.3 Aquatic Fauna

No significant effects on fish species are anticipated during the Operational Phase. Mandatory SuDS measures have been incorporated into the design to treat and minimise surface water runoff from the site.

6.3 Do nothing impact

Under the do-nothing scenario, the Site would continue to evolve. The recolonisation of bare ground habitat by native flora is likely occur and potentially offer suitable habitat for species, such as pollinating insects. The treelines would continue to serve as a biodiversity corridor providing nesting/roosting and foraging habitat for birds and mammals. The grassland would continue to offer floral species for local pollinators.

7 Mitigation and Enhancement Measures

7.1 Mitigation By Design

7.1.1 Planting of native flora and protecting pollinators

The planting of pollinator-friendly flora will improve local biodiversity and increase insect abundance. This will provide additional food for bats and birds at the Site.

The following measures have been incorporated into the landscape design:

- Tree species including Scot's Pine, Birch and upright Oak will be planted as part of the Proposed Development, providing habitat for local birds.
- Native hedgerow mix will provide nesting and commuting habitat, along with providing floral resources to pollinators in the area.
- Grassy areas will be maintained at varying heights, as suggested in the All-Ireland Pollinator Plan.

7.2 Construction Phase

7.2.1 Aquatic Fauna & Surface Waters

The following measures set out below will protect surface waters throughout the Construction Phase:

General surface water mitigation measures

- Storm drain inlets which could receive stormwater from the project will be protected throughout the Construction Phase. Inlet protection will be installed before soil-disturbing activities begin.
- Any imported materials will, as much as possible, be placed on site in their proposed location and double handling will be avoided. Where this is not possible designated temporary material storage areas will be used.
- Refuelling of plant during Construction Phase will only be carried out at designated refuelling station locations on site. Each station will be fully equipped for spill response

and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on site.

- Only emergency breakdown maintenance will be carried out on site. Drip trays and spill kits will be available on site to ensure that any spills from vehicles are contained and removed off site.

- All personnel working on site will be trained in pollution incident control response.

- Any other diesel, fuel or hydraulic oils stored on site will be stored in bunded storage tanks- the bunded area will have a volume of at least 110% of the volume of the stored materials as per best practice guidelines (Enterprise Ireland, BPGCS005).

- Portaloos and/or containerised toilets and welfare units will be used to provide facilities for site personnel. All associated waste will be removed from site by a licenced waste management contractor.

All wastewater generated on-site during the Construction Phase will be stored and disposed of appropriately. Under no circumstances will any untreated wastewater generated onsite (from equipment washing, road sweeping etc.) be released into the foul/surface water drainage network.

Contaminated soils if encountered will be segregated. If dewatering is required groundwater will be treated as required prior to discharge as agreed with the Local Authority.

7.2.2 Reduction of noise and dust related impacts

Reduction of noise impacts

Short-term increases in disturbance levels as a direct result of human activity and through increased generation of noise during the Construction Phase can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing.

Noise generated during the Construction Phase of the Proposed Development could cause temporary disturbance to a number of faunal species in the vicinity of the Site of the Proposed Development. To mitigate this disturbance, the following measures will be implemented:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors (e.g. treelines) as permitted by site constraints.
- Avoidance of unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.

- Use of alternative reversing alarm systems on plant machinery.
- Where noise originates from resonating body panels and cover plates, additional stiffening ribs or materials should be safely applied where appropriate.
- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Appointing a site representative responsible for matters relating to noise.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

These measures will ensure that any noise disturbance to nesting birds or any other fauna species in the vicinity of the Site of the Proposed Development will be reduced to a minimum.

Reduction of dust related impacts

The following general dust control measures will be followed for the duration of the Construction Phase of the Proposed Development and will ensure no significant dust related impacts occur to nearby sensitive receptors including local faunal species.

- Haulage vehicles transporting gravel and other similar materials to site will be covered by a tarpaulin or similar.
- Access and exit of vehicles will be restricted to certain access/exit points.
- Vehicle speed restrictions of 20km/hr will be in place.
- Bowsers will be available during periods of dry weather throughout the construction period.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil thereby reducing the amount of dust.
- Stockpiles will be stored in sheltered areas of the site, covered, and watered regularly or as needed if exposed during dry weather.
- Gravel should be used at site exit points to remove caked-on dirt from tyre tracks.
- Equipment should be washed at the end of each work day.
- Hard surfaced roads will be wet swept to remove any deposited materials.
- Unsurfaced roads will be restricted to essential traffic only.
- If practical, wheel-washing facilities should be located at all exits from the construction site.
- Dust production as a result of site activity will be minimised by regular cleaning of the site access roads using vacuum road sweepers and washers. Access roads should be cleaned at least 0.5km on either side of the approach roads to the access points.

- Public roads outside the site shall be regularly inspected for cleanliness, as a minimum daily, and cleaned as necessary. A road sweeper will be made available to ensure that public roads are kept free of debris.
- The frequency of cleaning will be determined by the site agent and is weather and activity dependent
- The height of stockpiles will be kept to a minimum and slopes will be gentle to avoid windblown soil dust.
- The following will be dampened during dry weather:
    - Unpaved areas subject to traffic and wind
    - Stockpiles
    - Areas where there will be loading and unloading of dust-generating materials
- Under no circumstances will wastewater from equipment, wheel or surface cleaning enter the surface water drainage network.

7.2.3 Invasive Species

While no invasive species were recorded on the Site of the Proposed Development, it is recommended that any non-native/invasive flora species encountered at the Site be controlled/removed as per the appropriate best-practice guidelines and in consultation with the relevant qualified invasive species professional. Removal and disposal will be carried out in accordance with appropriate guidelines such as TII (formerly NRA) Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (2010), with consideration given to the prevention of spread of these plants.

7.2.4 Biosecurity

The following will be adhered to, to avoid the introduction of invasive species to the Proposed Development site.

- Any material required on the site will be sourced from a stock that has been screened for the presence of any invasive species by a suitably qualified ecologist and where it is confirmed that none are present.
- All machinery will be thoroughly cleaned and disinfected prior to arrival on site to prevent the spread of invasive species.

7.3 Operational Phase

7.3.1 Bats

In order to minimise disturbance to bats within the general surrounding landscape, the lighting and layout of the Proposed Development will be designed to minimise light-spill onto habitats potentially used by the local bat population for foraging or commuting. This can be achieved by ensuring that the design of lighting accords with guidelines presented in the Bat Conservation Trust & Institute of Lighting Engineers *'Bats and Lighting in the UK - Bats and Built Environment Series'*, the Bat Conservation Trust *'Artificial Lighting and Wildlife Interim*

Guidance' and the Bat Conservation Trust *'Statement on the impact and design of artificial light on bats'*. Therefore, where possible, the lighting scheme will include the following:

- Lighting will only be installed where necessary for public safety in potential bat foraging and roosting locations. These lights have been designed and selected with specific shutters and filters to minimise any potential for back spills into the sensitive locations, such as the trees and hedgerow habitat on Site, while still providing the primary function of safely lighting the pedestrian routes.
- Reflectance's – Downward lighting can be reflected from bright surfaces. To minimize bat disturbance, the design avoids the use of bright surfaces and incorporates darker colour lamp heads and poles to reduce reflectance. Only luminaires with an upward light ratio of 0% and with good optical control to be used.
- Lighting controls and dimming shall be utilised for post-curfew times.
- Shielding of Luminaires & Light - To minimize bat disturbance, the design avoids the use of upward lighting by shielding or by downward directional focus. i.e., no upward tilt.
- Type of Light – To minimize bat disturbance, the design avoids the use of strong UV lighting. The lighting design is based on the use of LED lighting which has minimal or no UV output of significance. Warmer 2700°K LED lighting will be utilized for amenity areas, as the warmer colour temperatures with peak wavelengths greater than 550nm (~3000°K) cause less impacts on bats.

7.3.2 Birds

Tree and shrub species will be included as part of the Landscape Design for the Proposed Development and will provide foraging and potential nesting habitat for birds within the vicinity of the Site.

It is recommended that bird nest boxes are incorporated into the Proposed Development where possible. Nest boxes can be attached, via wire strap, to the trees on Site, particularly those located along the southwest and northwest boundaries of the Site. Nest boxes with holes can be located approximately 2-4m off the ground, and open-fronted nest boxes less than 2m from the ground, within dense vegetation, for Wrens, Robins, and Blackbirds in the vicinity of the Proposed Development. It is recommended that nest boxes face between north and southeast, and are located within a sheltered area where they are protected from wind, rain, and strong sunshine.

8 CUMULATIVE IMPACTS

If the Proposed Development and existing or proposed projects or plans impact on the same KERs, there is potential to lead to cumulative impacts which could be of a higher level of significance.

8.1.1 Existing granted planning permissions

There are several existing planning permissions on record in the area ranging from small-scale extensions and alterations to existing residential properties to some larger-scale developments. The larger-scale developments within the area are outlined below:

Planning Application Reference: SD16A/0302/EP.

Construction of three 3 storey office buildings, with a total floor area of approx. 16,732sq.m. The proposed development also provides for plant rooms at roof level, all associated site development works, landscaping, café (57sq.m), bicycle parking, car parking at surface level, basement level & a two level podium car park in the north-east corner of the site incorporating shower & changing facilities (152sq.m), ESB substations & service plant, and bin storage, all on a site area of 3.74ha. The effect of the proposed development will be a modification to part of an extant permission under Reg.Ref. SD06A/0737 & SD06A/0737/EP. The proposed development also provides for 2 vehicular access points off Kingswood Road (Old Naas Road) and 2 vehicular access points of Kingswood Avenue. **(Decision: Grant Extension of Duration of Permission. Decision Date: 22/06/2021).**

Planning Application Reference: SD21A/0039.

Installation of 2 x 3 meter high extract flues from proposed laboratories; construction of a covered boat storage compound within a secured parking area formed with a new 3 metre high security fence with access gates to the rear (north-west) side of the site, internal alteration within the existing building and all associated site works. **(Decision: Grant Permission. Decision Date: 07/07/2021).**

Planning Application Reference: SD14A/0123/EP.

6 two storey, 3 bedroom semi-detached houses and all associated site works on a 0.19 hectare site bound by Silken Park to the north, an existing office development to the south, undeveloped residential zoned lands to the east and Kingswood Road to the west. **(Decision: Grant Extension of Duration of Permission. Decision Date: 22/01/2020).**

Planning Application Reference: SD20A/0125.

1 x 50 KWp solar photovoltaic (PV) system on main office building. There will be a total of 156 PV panels on the main office roof and will occupy an area of 257sq.m. **(Decision: Grant Permission. Decision Date: 27/07/2020).**

Planning Application Reference: SD20A/0219.

Residential development consisting of 99 dwellings comprised of 84 two storey houses, 15 apartments and duplex units accommodated in 2 three storey blocks; the proposed houses are comprised of 9 two bed houses, 71 three bed houses, 4 four bed houses; the proposed apartments & duplex units are comprised of 6 one bed units, 3 two bed units and 6 three bed

units, also providing for all associated site development and infrastructural works, car and bicycle parking, ESB sub-station, open spaces and landscaping, bin and bicycle storage; access to the development via a new vehicular entrance on the western boundary of the site, off the existing access road to the Luas park & ride facility on a site area of 3.14ha bounded to the north by Citywest Avenue, located east of a permitted residential development known as Citywest Village and existing ESB sub-station and is north of the Luas red line. **(Decision: Grant Permission. Decision Date: 06/05/2021).**

Planning Application Reference: SD21A/0150.

Construction of 4 warehouse/industrial units in 3 buildings of c.13,611sq.m total gross floor area (including ancillary offices and operational facilities) and up to 15m in height, with rear service yards; 155 car parking spaces; 72 cycle parking spaces; water services infrastructure and sustainable urban drainage system features, including relocation and resizing of a pump station permitted under SD15A/0391; internal road network accessed via 2 site entrances established in the previous planning applications on the Eastern and Southern sides of the site, via the roundabout at Citywest Avenue and the R136 outer ring road; amendments to the proposed tree pits along the green-link permitted under SD15A/0391; public lighting, landscaping, planting and boundary treatments throughout the development; all other necessary site and infrastructural works to facilitate the development. **(Decision: Grant Permission. Decision Date: 07/10/2021).**

Planning Application Reference: SD15A/0391/EP.

Installation of site services including the construction of a new gravity foul sewer, foul pumping station and rising main discharging to the public sewer, connection to the public watermain, boundary landscaping and planting treatments including removal of central hedgerow, provision of 'green link' path. Installation of a sub-surface collector drain and infilling of central dry drainage channel. Vehicular and pedestrian/cyclist access points, internal road commencement (details as marked on submitted plans) and all ancillary development works as necessary to facilitate future development at this site. **(Decision: Grant Extension of Duration of Permission. Decision Date: 14/12/2020).**

Planning Application Reference: SD15A/0127/EP.

A residential/mixed use development on a site area of 12.45ha consisting of 400 dwellings comprised of 340 no. 2 storey detached, semi-detached and terraced houses, i.e. 3 no. 2 bed houses, 323 no. 3 bed houses & 14 no. 4 bed houses along with 60 no. 1 and 2 bed apartments in 4 no. 3 & 4/5 storey buildings. The development also provides for a creche (615sq.m), kiosk (56.6sq.m) and retail unit (237sq.m). The proposed development includes all associated site development and infrastructural works, car parking, open spaces and landscaping, ESB substation and 4 associated kiosks. Access to the development will by via two proposed new vehicular entrances from Citywest Avenue and Fortunestown Lane respectively and will also provide for two new vehicular crossing points over the Luas line. The development also includes for the demolition of an existing dwelling in the southwest corner of the site at the junction of Citywest Road and Fortunestown Lane. The site is bounded to the north by Citywest Avenue, to the west by the N82 Citywest Road, to the south by Fortunestown Lane, to the east by Ard Mor residential estate and is adjacent to the Luas Red Line. **(Decision: Grant Extension of Duration of Permission. Decision Date: 01/07/2020)**.

Planning Application Reference: SD21A/0327.

A residential development of 77 dwellings comprised of 63 two storey houses and 14 apartments & duplex units accommodated in one 3 storey building. The proposed houses are comprised of 8 two bed houses & 55 three bed houses; the proposed apartments & duplex units are comprised of 7 one bed apartments at ground floor & 7 three bed duplex units overhead. The proposed development also provides for all associated site development & infrastructural works, car & bicycle parking, open spaces, hard & soft landscaping, boundary treatments and bin & bicycle storage; access to the development will be via a new vehicular entrance at the south-west corner of the site off the Old Naas Road. Permission is also sought to demolish the existing building on site approximately 455sq.m. all on a site area of 2.28Ha, at Gordon Park, Old Naas Road, Kingswood, Dublin 22 bounded to the west by the Old Nass Road, to the south by the Silken Park development and is located in the townland of Brownsbarn. **(Decision: Grant Permission. Decision Date: 19/05/2022)**.

Planning Application Reference: SD21A/0162.

Construction of 2 warehouses with ancillary office and staff facilities and associated development; Unit 1 will have a maximum height of 16.35 metres with a gross floor area of 8,156sq.m including a warehouse area (7,397sq.m), ancillary office areas (362sq.m) and staff facilities (397sq.m); Unit 2 will have a maximum height of 15.35 metres with a gross floor area of 5,990sq.m including a warehouse area (5,031sq.m), ancillary office areas (536sq.m) and staff facilities (423sq.m); vehicular access/egress routes to the subject site via the existing roundabout and access road; alteration to the existing access arrangements to the subject lands to facilitate safe traffic flow to/from the proposed facilities; pedestrian access; 109 car parking spaces; bicycle parking; HGV Parking; HGV yards; level access goods doors; dock levellers; access gates; signage; hard and soft landscaping; lighting; boundary treatments; ESB substation; sprinkler tanks; pump houses; and all associated site development works above and below ground on lands bounded to the south by the N7 Naas Road, to the north and west by the National Distribution Centre and to the east by Brownsbarn Drive and the Royal Garter Stables, a Protected Structure (RPS Ref. 261). **(Decision: Grant Permission. Decision Date: 28/03/2022).**

At the time of writing, there are no proposed or permitted forestry operations (thinning, clear felling, road construction) in close proximity to the Site of the Proposed Development[5].

Given the lack of natural habitat within the proposed sites and distance and urban buffer between the Proposed Development site and the above-mentioned permitted developments, it is concluded that there is no potential for in-combination effects to arise as a result of the Proposed Development on local ecology.

8.1.2 Relevant policies and plans

The following policies and plans were reviewed and considered for possible in-combination effects with the Proposed Development.

- Connecting with Nature – Draft Biodiversity Action Plan for South Dublin County 2020-2026

[5] https://forestry-maps.apps.rhos.agriculture.gov.ie/

- South Dublin County Council Development Plan 2016-2022

The Connecting with Nature – Draft Biodiversity Action Plan for South Dublin County 2020-2026 is set out to protect and improve biodiversity, and as such will not result in negative in-combination effects with the Proposed Development. The South Dublin County Council Development Plan 2016-2022 has directly addressed the protection of biodiversity through specific policies (NCBH1 Obj2, NCBH2, NCBH4, NCBH5). The relevant recommendations and mitigation measures have been integrated into the plan.

On examination of the above it is considered that there are no means for the Proposed Development to act in-combination with any plans or projects, that would cause any likely significant effects on any European sites.

In addition, sustainable development including SuDS measures for all new developments is inherent in the objectives of all development plans within the Greater Dublin Area.

8.1.3 Operation of Ringsend WwTP

The Site will be served by Ringsend WwTP via a newly constructed foul water connection.

In June 2018 Irish Water applied for and subsequently received planning permission in 2019 for upgrade works to the Ringsend WwTP facility. The first phase of upgrade works to Ringsend WWTP was completed in December 2021, which increased the capacity of the facility by 400,000 P.E. These works, together with the further works permitted in 2019 will ultimately increase the capacity of the facility from 1.6 million PE to 2.4 million PE. This plant upgrade will result in an overall reduction in the final effluent discharge of several parameters from the facility including BOD, suspended soils, ammonia, DIN and MRP. An Environmental Impact Assessment Report (EIAR) was submitted by Irish Water as part of that application. The EIAR contains sections relating to Marine Biodiversity and Terrestrial Biodiversity, and each contains a section on the 'do-nothing scenario'. These review the effects of the WwTP on biodiversity in Dublin Bay *in the absence of the upgrade works* and so are relevant to this report.

The EIAR report acknowledges that under the do-nothing scenario "the areas in the Tolka Estuary and North Bull Island channel will continue to be affected by the cumulative nutrient loads from the river Liffey and Tolka and the effluent from the Ringsend WwTP", which could result in a decline in biodiversity (Irish Water, 2018). Nevertheless, the negative impacts of nutrient over-enrichment, which could result in the deterioration of the biological status of Dublin Bay are considered "unlikely" (Irish Water, 2018). This is because historical data suggests that pollution in Dublin Bay has had little or no effect on the composition and richness of the benthic macroinvertebrate fauna. The EIAR notes that "although a localised decline could occur, it is not envisaged to be to a scale that could pose a threat to the shellfish, fish, bird or marine mammal populations that occur in the area." Furthermore, the EIAR notes that significant impacts on waterbird populations foraging on invertebrates in Dublin Bay due to nutrient over-enrichment are "unlikely" to occur (Irish Water, 2018). What is important in the context of this EcIA is that the do-nothing scenario predicts that nutrient and suspended solid loads from the WwTP will "continue at the same levels and the impact of these loadings should maintain the same level of effects on marine biodiversity" and that "if the *status quo* is maintained there will be little or no change in the majority of the intertidal faunal assemblages

found in Dublin Bay which would likely continue to be relatively diverse and rich across the bay."

Therefore, it can be concluded that significant effects on marine biodiversity and the European sites within Dublin Bay from the *current* operation of Ringsend WwTP are unlikely. Importantly, this conclusion is not dependent upon any future works to be undertaken at Ringsend. Thus, in the absence of any upgrading works, significant effects to habitats, fauna and Natura 2000 sites are not likely to arise.

On examination of the above it is considered that there are no means for the Proposed Development to act in-combination with any plans or projects.

9 Residual Impacts

Residual impacts are impacts that remain once mitigation has been implemented or impacts that cannot be mitigated. Table 7 provides a summary of the impact assessment for the identified Key Ecological Resources (KERs) and details the nature of the impacts identified, mitigation proposed and the classification of any residual impacts.

Provided all mitigation measures are implemented in full and remain effective throughout the lifetime of the Development, no significant negative residual impacts on the local ecology or on any designated nature conservation sites are expected from the Proposed Development.

TABLE 7 SUMMARY OF POTENTIAL IMPACTS ON KER(S), MITIGATION PROPOSED AND RESIDUAL IMPACTS

Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation	Residual Impact
			Quality	Scale	Duration	Significance		
Bat assemblage	Local Importance (lower value)	Disturbance due to noise generated during Construction Phase. Disturbance/removal of foraging routes/habitat due to increased lighting as a result of the Proposed Development.	Negative	Local	Short-term Permanent	Slight	Planting of shrub and tree species to take place as part of project design. Bat sensitive lighting measures incorporated into the Construction Phase and public lighting design described in **section 7.3.1**	**Positive; Permanent** **Negligible**
Breeding-Bird assemblage	Local Importance (lower value)	Loss of potential foraging habitat. Disturbance due to noise generated during Construction Phase.	Negative	Local	Permanent Short-term	Moderate Slight	Planting of shrub and tree species to take place as part of project design. It is recommended to place bird nest boxes within the trees on Site. Construction related noise control/minimisation measures to be implemented.	**Positive; Permanent** **Negligible**
Aquatic Fauna (Brown trout, Frog)	Local Importance (lower value)	Deterioration in water quality due to surface water discharges associated with the Construction Phase.	Negative	Local	Short-term	Moderate	Mitigation measures to protect surface waters as outlined in **section 7.2.1**	**Negligible**

10 CONCLUSION

It is considered that provided the mitigation measures proposed are carried out in full, there will be no significant negative impact to any valued habitats, designated sites or individual or group of species as a result of the Proposed Development.

Based on the successful implementation of these measures and proposed works, to be carried out in accordance with the landscape plan, there will be no significant negative ecological impacts arising from Construction and Operational Phases of the Proposed Development.

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APPENDIX I – VALUE OF ECOLOGICAL RESOURCES

The criteria outlined in the table below, taken from the Guidelines for *Assessment of Ecological Impacts of National Road Schemes* published by the NRA, were used for assigning value to designated sites, habitats and species within the Site of the Proposed Development and surrounding area.

Importance	Criteria

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.
	- 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) 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).

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) of the following:
	  - Species protected under the Wildlife Acts; and/or
	  - Species listed on the relevant Red Data list.
	- Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.

County Importance	- Area of Special Amenity. - 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) 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 (Biodiversity Action Plan), 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) 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.

APPENDIX II – EPA IMPACT ASSESSMENT CRITERIA

Criteria used to define quality of effects.

In line with the draft EPA Guidelines (EPA, 2022), the following terms are defined when quantifying the quality of effects:

Quality	Definition
Positive Effects	A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative/adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property by causing nuisance).

Criteria used to define significance of effects.

In line with the draft EPA Guidelines (EPA, 2022), the following terms are defined when quantifying significance of impacts:

Significance of Effects	Definition
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 which alters the character of the environment in a manner that is consistent with existing and emerging baseline 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.

Criteria used to define duration of effects.

In line with the draft EPA Guidelines (EPA, 2022), the following terms are defined when quantifying duration and frequency of effects:

Quality of Effects	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	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 that can be undone, for example through remediation or restoration.
Frequency of Effects	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).