Carrigmore Park Redevelopment, Co. Dublin

Ecological Impact Assessment

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South Dublin
County Council.

JBA Project Manager

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Revision History

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S3 - P01 / 12-10-2023	Draft Report	Hannah Johnson (SDCC)

Contract

This report describes work commissioned by the Dylan O'Brien on behalf of South Dublin County Council by an email dated 5th of July 2023. Michael Coyle of JBA Consulting conducted this work.

Prepared by ..... Michael Coyle, BA (Hons), MSc

…….. Assistant Ecologist

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…….. Principal Ecologist

Purpose

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Abbreviations

AA	Appropriate Assessment
BAP	Biodiversity Action Plan
BoCCI	Birds of Conservation Concern in Ireland
DoEHLG	Department of Environment, Heritage and Local Government
CIEEM	Chartered Institute of Ecology and Environmental Management
EC	European Communities
EcIA	Ecological Impact Assessment
EPA	Environmental Protection Agency
EU	European Union
GIS	Geographical Information Systems
GSI	Geological Survey Ireland
IAQM	Institute of Air Quality Management
NBDC	National Biodiversity Data Centre
NPWS	National Parks and Wildlife Service
pNHA	Proposed Natural Heritage Area
PRF	Potential Roost Feature
QI	Qualifying Interest
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SDCC	South Dublin County Council
SPA	Special Protection Area
SuDS	Sustainable Drainage System
WFD	Water Framework Directive
ZoI	Zone of Influence

1 Introduction

JBA Consulting Ireland Ltd. has been commissioned by Dylan O'Brien on behalf of South Dublin County Council to undertake an Ecological Impact Assessment (EcIA) in relation to the refurbishment of Carrigmore Park in Citywest, Co. Dublin.

1.1 Aims

The aims of this EcIA are to:

- Establish baseline ecological conditions to enable identification of potentially important ecological features within the zone of influence of the project,
- Determine the ecological value of identified ecological features,
- Assess the significance of impacts of the proposed project on ecological features of value,
- Identify avoidance, mitigation or compensatory measures,
- Identify residual impacts after mitigation and the significance of their effects,
- Identify opportunities for ecological enhancement,

1.2 Site location

The proposed site is at located Citywest Co. Dublin, approximately 100m south-west of the Citywest Shopping Centre and approximately 520m north-west of the Blessington Road (N81). The Corbally Stream, which is a tributary of the WFD Watercourse Camac_020, is located along the south-west boundary of the site. There is a ditch network (though largely dried out) associated with this stream present throughout site, before flowing east to the join the Baldonnell Stream (Upper), which is a second tributary of the Camac_020. The location of the site is shown in Figure 1-1.

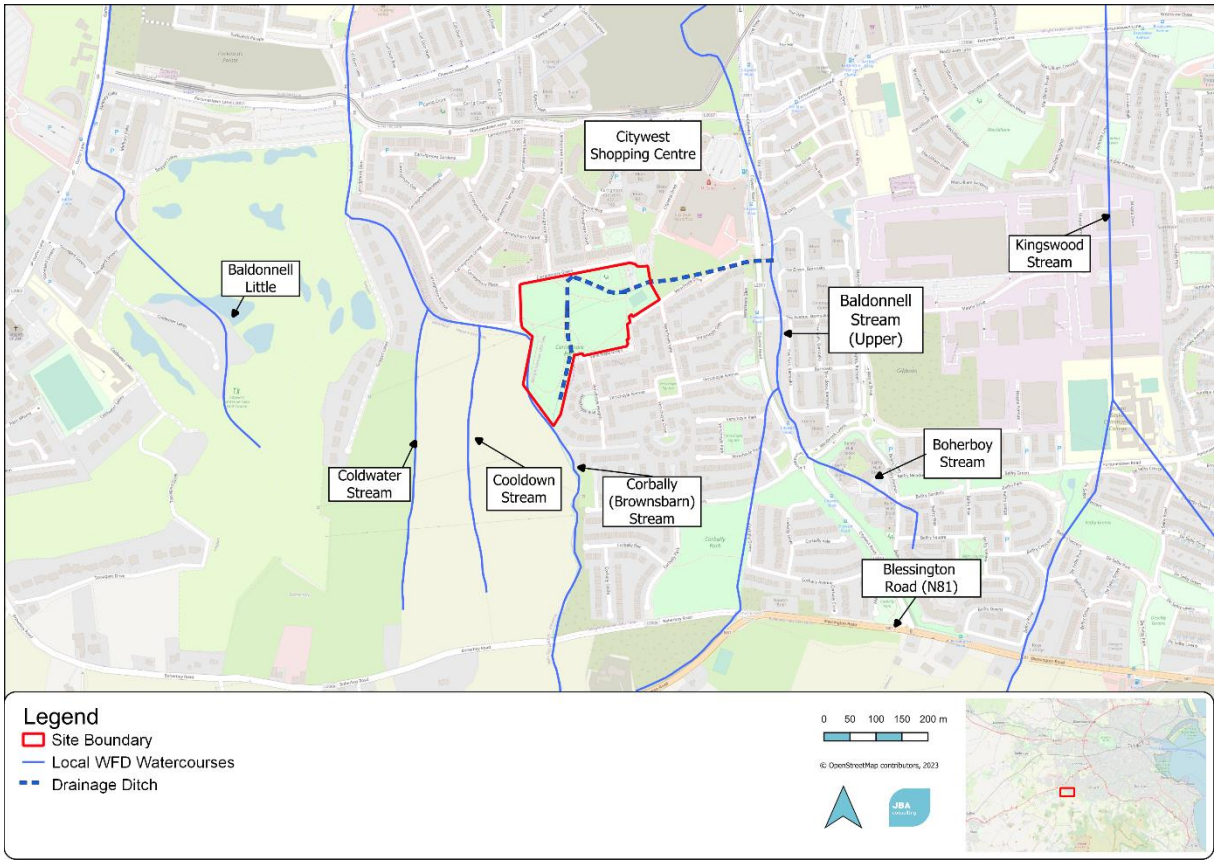


Figure 1-1: Site location and boundary of work (© OpenStreetMap contributors, 2023)

2 Project Description

2.1 Proposed project

The proposed and preferred development of the project includes the redevelopment of Carrigmore Park. The Masterplan Proposals of the project include:

- A proposed new Sports Pitch (65m x 40m)
- BMX Pump Track
- Footpath Realignment
- Creation of grasscrete footpaths
- Bench installations
- Two proposed wetland areas
- The retention and possible enhancement of all existing hedgerows
- A hedge bridge that will cut through an existing gap in the hedges
- Proposed planting of native trees including Hawthorn, Willow, Alder and Birch, which will be:
    - Along the north-west and north verge of the park,
    - Around the existing playground
    - Around the proposed Sports Pitch,
    - Along the existing basketball court
    - A mini woodland in the west of the site

Excavations throughout the site will be mixed to accommodate a range of proposed features:

- The proposed pitch will have a depth of 500mm, with the inclusion of a soakaway which will have excavations of up to 2m,
- The BMX pump track will require a mixture of excavations of 300m and the creation of mounds,
- The teen space and calisthenics area will have an estimated depth of 300mm, however there may be some deeper insertions of poles for the frame foundation,
- Minor additional excavations may be required for the realignment of the footpath,

The Site Layout Plan can be view in Appendix A.

2.1.1 Duration of the Works

The envisaged timeframe of the project will last approximately 13 months, beginning in November 2023, and ending in December 2024.

2.1.2 Site Drainage Plan

Wastewater from the site will be treated through the use of attenuation utilising two wetlands, located south-west and north-east of the existing soccer pitch.

An additional soakaway is currently proposed west of the proposed pitch excavation.

The Site Drainage Plan can be view in Appendix B.

2.1.3 Site Landscape Plan

The project will involve the creation of a tree trail which will involve the planting of 3 native trees (Alder, Willow, and Hawthorn) in addition to the treeline that is already existing (Appendix A). The project also involves the planting of a number of trees across the site, including a mini-woodland (see site layout) however, the species have not yet been determined. The species will be native Irish species and may include Pedunculate Oak, Lime, Scots Pine, and as well as non-native Himalayan Birch *Betula utilis*. A row of pleached Limes will be planted along the basketball court.

These details can also be seen in the Site Layout Plan which can be view in Appendix A

3 Methodology

3.1 The EcIA Team

This EcIA was completed by JBA Ecologists Michael Coyle, BA (Hons), MSc and the report has been reviewed by JBA Principal Ecologist Patricia Byrne BSc (hons), PhD, MCIEEM.

These staff members thus fulfil the Environmental Impact Assessment (EIA) Directive personnel requirements of 'competent persons'.

3.2 Policy and Legislation

Policy and legalisation for nature conservation; and protected and priority species relevant to the proposed project is provided in Appendix C.

3.3 Methods

This EcIA assesses the ecological features present within the site and its surrounding area (the Zone of Influence (ZoI)) in relation to the proposed works. This allows for identification of the potential impacts of the proposed works upon the ecological features of the site at an early stage, whilst identifying the potential ecological constraints upon the proposed works. The assessment is based on a desk-based assessment, which determines the baseline conditions at the site of the proposed works, and site surveys, which provided information on habitats and species present on the site and its surroundings.

This EcIA will outline the findings of the desk-based assessment and the surveys and identify any potential impacts of the proposed works on ecological features within the ZoI of the site; and propose mitigation measures to avoid or reduce impacts where necessary.

3.4 Guidance

This assessment was conducted in accordance with the following guidance documents:

- Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management (CIEEM, 2018).
- Guidelines on the information to be contained in Environmental Impact Assessment Reports Environmental Protection Agency (EPA, 2022).
- Best Practice Guidance for Habitat Survey and Mapping, The Heritage Council. (Smith et al., 2011b).

3.5 Baseline

To determine the baseline conditions at the site a review of all available information was made. When determining the pre-work conditions on-site, including the presence or absence of protected habitats and/or species, the precautionary principle was used where limited information was available.

A desk-based assessment was carried out to collate information regarding protected/notable species and statutorily designated nature conservation sites in, or within close proximity to, the study area. This included a data search for protected and notable species using the National Biodiversity Data Centre (NBDC) Mapping System (NBDC, 2023). A customised 2km polygon was created to extract all the species data from the project site and its surrounding area, while an extended customised 5km polygon was created to extract all species data in the set Zone of Influence for this project.

Information for statutory designated sites including Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Ramsar Sites, Natural Heritage Areas (NHAs) and proposed NHAs (pNHA) was collected from the online resources provided by the National Parks and Wildlife Service (NPWS).

Other information on the local area was obtained, including:

- EPA, 2023a. EPA Catchments.ie [online]. Available online at: https://www.catchments.ie/maps/
- EPA, 2023b. EPA Maps [online], Next Generation EPA Maps. Available online at: https://gis.epa.ie/EPAMaps/

- GSI, 2023. Geological Survey Ireland Spatial Resources website, available at https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228
- IFI, 2022. Water Framework Directive Fish Ecological Status 2008-2021 Available online at: https://opendata-ifigis.hub.arcgis.com/datasets/IFIgis::water-framework-directive-fish-ecological-status-2008-2021/explore?location=53.365760%2C-6.414157%2C14.45
- NPWS, 2019a. The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- NPWS, 2019b. The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitats Assessment. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neil. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- NPWS, 2019c. The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessment. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neil. . National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- Aerial photography available from www.osi.ie and Google Maps http://maps.google.com/ ;
- Online data available on Natura 2000 sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie
- National Biodiversity Data Centre, 2023 – Species Distribution Maps; Available online at www.biodiversityireland.ie Accessed on various dates;
- All Ireland Red Data lists for vascular flora, mammals, butterflies, non-marine molluscs, dragonflies & damselflies, amphibians and fish;
- Water Framework Directive water maps (available online at http://www.wfdireland.ie/maps.html and https://www.catchments.ie/); and
- International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species (available online at http://www.iucnredlist.org).

3.5.1 Zone of Influence

The project will primarily affect the site only, but a wider Zone of Influence (ZoI) is utilised for impacts relating to noise disturbance (300m); air pollution (500m as per the Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2023)); groundwater and surface water pollution (5km), with an additional 15km buffer for hydrologically connected transitional and coastal waters. .

3.5.2 Field Surveys

A general ecological site walkover, including habitat mapping, mammal and preliminary bat roost surveys were conducted on the 11th of August 2023 by Ecologists William Mulville and Michael Coyle, while additional mammal surveys and walking bat transect was completed on the 29th of August by JBA Ecologists Mark Desmond and Dominic Tilley of JBA Consulting to inform the initial ecological baseline of the site.

The ecological walkover surveys recorded habitats and protected species, following guidance outlined in the documents below:

- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009)
- Best Practice Guidance for habitat Survey and Mapping. The Heritage Council. (Smith et al., 2011)
- Collins, J. (Ed.), 2016. Bat Surveys for Professional Ecologists: Good Practise Guidelines (3rd Edition)

Aerial photographs and site maps assisted the habitat survey. Habitats have been named and described following A Guide to Habitats in Ireland by Fossitt (2000). Nomenclature for higher plants follows that given in The New Flora of the British Isles 4th Edition (Clive Stace 2019). Identification of Irish plants generally follows Webb's An Irish Flora (Parnell and Curtis, 2012).

3.5.3 Water Framework Directive

In response to the increasing threat of pollution and the increasing demand from the public for cleaner rivers, lakes and beaches, the EU developed the Water Framework Directive (WFD). This Directive is unique in that, for the first time, it establishes a framework for the protection of all waters including rivers, lakes, estuaries, coastal waters and groundwater, and their dependent wildlife/habitats under one piece of environmental legislation for all European member states.

The WFD (Directive 2000/60/EC) is a substantial piece of EU water legislation that came into force in 2000. The overarching objective of the WFD is for the water bodies in Europe to attain Good or High Ecological Status. The Environment Protection Agency (EPA) is the competent authority in Ireland responsible for delivering the WFD. River Basin Management Plans (RBMP) have been created which set out measures to ensure that water bodies in the country achieve 'Good Ecological Status'.

Good Ecological Quality will depend on the quality of the individual quality elements on which the Ecological status is scored; namely the biological, chemical and morphological condition in a particular water body. Any reduction in any of these elements will result in a reduction of the overall ecological status.

3.5.4 Water Framework Status and Objectives

It is understood that Draft River Basin Management Plan for Ireland (2022-2027) has been adopted by all local authorities in order to achieve the aims of the WFD. The Plan sets out the new approach that Ireland will take to enhance protection, prevention, and monitoring of Irish waterbodies. The main actions include:

- Improve waste water treatment;
- Conservation and leakage reduction;
- Scientific assessment of water bodies and implementation of local measures;
- A new collaborative Sustainability and Advisory Support Programme;
- Dairy Sustainability Initiative;
- Development of water and planning guidance for local authorities;
- Extension of Domestic Waste Water Treatment Systems grant Schemes; and
- A new Community Water Development Fund

Regardless of their current quality, surface waters should be treated the same in terms of the level of protection and mitigation measures employed, i.e., there should be no negative change in status.

The third and current cycle aims to build particularly on the initiatives of the second cycle, particularly the governance and implementation structures, and to improve the establishment of Irish Water, An Fóram Uisce (The Water Forum), the Local Authority Waters Programme and the Agricultural Sustainability Support and Advisory Programme.

3.6 Screening of Ecological Features

The ecological features identified during the walkover surveys and from desk-based assessments were reviewed.

An informal screening process is presented at the start of the results section to ensure that the assessment focuses only on features where the impact could have important consequences for biodiversity (valued ecological features). Any features which are important beyond the site level were identified for further evaluation. Ecological features with little or no value beyond the site level were screened out and a short statement explaining this is given in the screening section.

An Appropriate Assessment (AA) Screening Report has been produced separate to this EcIA (JBA, 2023), to assess the potential for effects on Designated Natura 2000 sites. The AA Screening Report concluded there was **no potential for adverse significant effects on European sites** arising from the proposed development, either alone or in-combination with other plans or projects.

3.7 Assessment of the Effects on Features

Ecological features include nature conservation sites, habitats, species assemblages/ communities, populations or groups of species. The assessment of the significance of predicted impacts on ecological features is based on both the 'value' of a feature, and the nature and magnitude of the impact that the

project will have on it. The impact is based on the project which includes a certain amount of designed-in mitigation, including construction best practice measures that will be implemented with a high degree of certainty.

3.8 Valuation of Receptors

The value of designated sites, habitats and species populations is assessed with reference to:

- Their importance in terms of 'biodiversity conservation' value (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations).
- Any social benefits that habitats and species deliver (e.g., relating to enjoyment of flora and fauna by the public).
- Any economic benefits that they provide.

The valuation of designated sites considers different levels of statutory and non-statutory protection. Assessment of habitat depends on several factors, including the size of the habitat, its conservation status and quality. The assessment also takes account of connected off-site habitat that may increase the value of the on-site habitat through association. Valuation of species depends on a number of factors including distribution, status, rarity, vulnerability, and the population size present.

Designated sites, habitats and species populations have been valued using the scale in Table 3-1.

Table 3-1: Examples of criteria used to define the value of ecological features (derived NRA, 2008, rev. 2009)

Level of Value	Examples of Criteria
International	An internationally important site e.g. Special Protection Area (SPA), Special Area of Conservation (SAC), Ramsar (or a site considered worthy of such designation). A regularly occurring substantial population of an internationally important species (listed on Annex IV of the Habitats Directive). Designated shellfish waters. Major fisheries area.
National	A nationally designated site e.g. Natural Heritage Area (NHA), a proposed Natural Heritage Area (pNHA), statutory Nature Reserve, or a site considered worthy of such designation. A viable area of a habitat type listed in Annex I of the Habitats Directive or of smaller areas of such habitat which are essential to maintain the viability of a larger whole. A regularly occurring substantial population of a nationally important species, e.g. listed on The Wildlife Act 1976 or The Wildlife (Amendment) Act 2000. A species included in the Irish Red Data Lists/Books. Significant populations of breeding birds.
Regional/County (County Dublin)	Species and habitats of special conservation significance within County Dublin. An area subject to a project/initiative under the County's Biodiversity Action Plan. A regularly occurring substantial population of a nationally scarce species.
Local (works site and its vicinity)	Areas of internationally or nationally important habitats which are degraded and have little or no potential for restoration. A good example of a common or widespread habitat in the local area. Species of national or local importance, but which are only present very infrequently or in very low numbers within site area.
Less than local	Areas of heavily modified or managed vegetation of low species diversity or low value as habitat to species of nature conservation interest. Common and widespread species.

Guidance published by CIEEM (2018) recommends breaking down the importance of ecological features in a geographic context similar to the NRA guidance shown in Table 3-1 with the following frame of reference to be adapted to local circumstances.

- International and European
- National
- Regional
- Metropolitan, County, vice-county or other local authority-wide area
- River Basin District
- Estuarine system/Coastal cell
- Local

The NRA (2009) guidance is congruent with this CIEEM (2018) guidance and includes a 'Less than local' level. The NRA (2009) guidance on geographic criteria for ecological valuation, as described in Table 3-1 is followed in this report.

Ecological Valuation may also be considered of Local Importance (higher value) or Local Importance (lower value) (Table 3-2).

Table 3-2: Examples of criteria used to define the value of ecological features of local importance (NRA, 2009)

Level of Value	Examples of Criteria
Local Importance (higher value)	Locally important populations of priority species or habitats or natural heritage features identified in the Local Biodiversity Action Plan (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.

3.8.1 Magnitude of Impacts

Ecological effects or impacts can be described and categorised in a number of ways. Examples of relevant terms are listed in the table below.

Table 3-3: Categories of Effects (derived EPA, 2022a).

Description	Categories of Effects
Quality of Effects	**Positive Effects** A change which improves the quality of the environment (for example, by

Description	Categories of Effects
	increasing species diversity; or the improving 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 or by causing nuisance).
Describing the Significance of Effects	**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 Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects 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 Effects An effect which obliterates sensitive characteristics.
Describing the Extent and Context of Effects	**Extent** Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?).
Describing the Probability of Effects	**Likely Effects** The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects	**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 Effects lasting one to seven years.
	Medium-term Effects

Description	Categories of Effects
	Effects lasting seven to fifteen years.
	Long-term Effects Effects lasting fifteen to sixty years.
	Permanent Effects Effects lasting over sixty years.
	Reversible Effects 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).
Describing the Types of Effects	**Indirect Effects (a.k.a. Secondary or Off-site Effects)** Effects on the environment. Which are not a direct result of the project, often produced away from the project site of because of a complex pathway.
	Cumulative Effects The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
	Do-nothing Effects The environment as it would be in the future should the subject project not be carried out.
	Worst Case Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SOx and NOx to produce smog).

3.8.2 Significance of impacts

The overall significance of an impact can be derived from the total description of the effect compared against the sensitivity and significance (value) of the receptor as shown overleaf in Figure 3-1 which is taken from the EPAs EIAR Guidelines (EPA, 2022). The context and character of the receptor must also be assessed, such as its position in relation to the effect and its connectivity to the effect, however this should be determined before assessing the significance of the impact.

The total description of the effect includes the character, magnitude, probability and consequences of the effect as described in Table 3-4 which are combined to give a general description of the effect on an ordinal scale from Negligible to High. The sensitivity and significance of the receptor is also described on an ordinal scale from Negligible to High.

The placement of the general description of the effect, and the sensitivity/significance of the receptor on this scale is determined by a Competent Person (a qualified ecologist in this case) as they interpret the qualities of the effect from the categories listed in Figure 3-1 and the receptors sensitivity and significance. Level of significance, also described as value of the receptor is previously set out in sub-section 3.8 above. Sensitivity of the receptor is assessed by the Competent Person based on the receptor's characteristics and how susceptible to impact they are from the type of effect.

The overall significance of an effect is then categorised into one of the following seven classifications:

- Imperceptible
- Not Significant
- Slight
- Moderate
- Significant
- Very Significant
- Profound

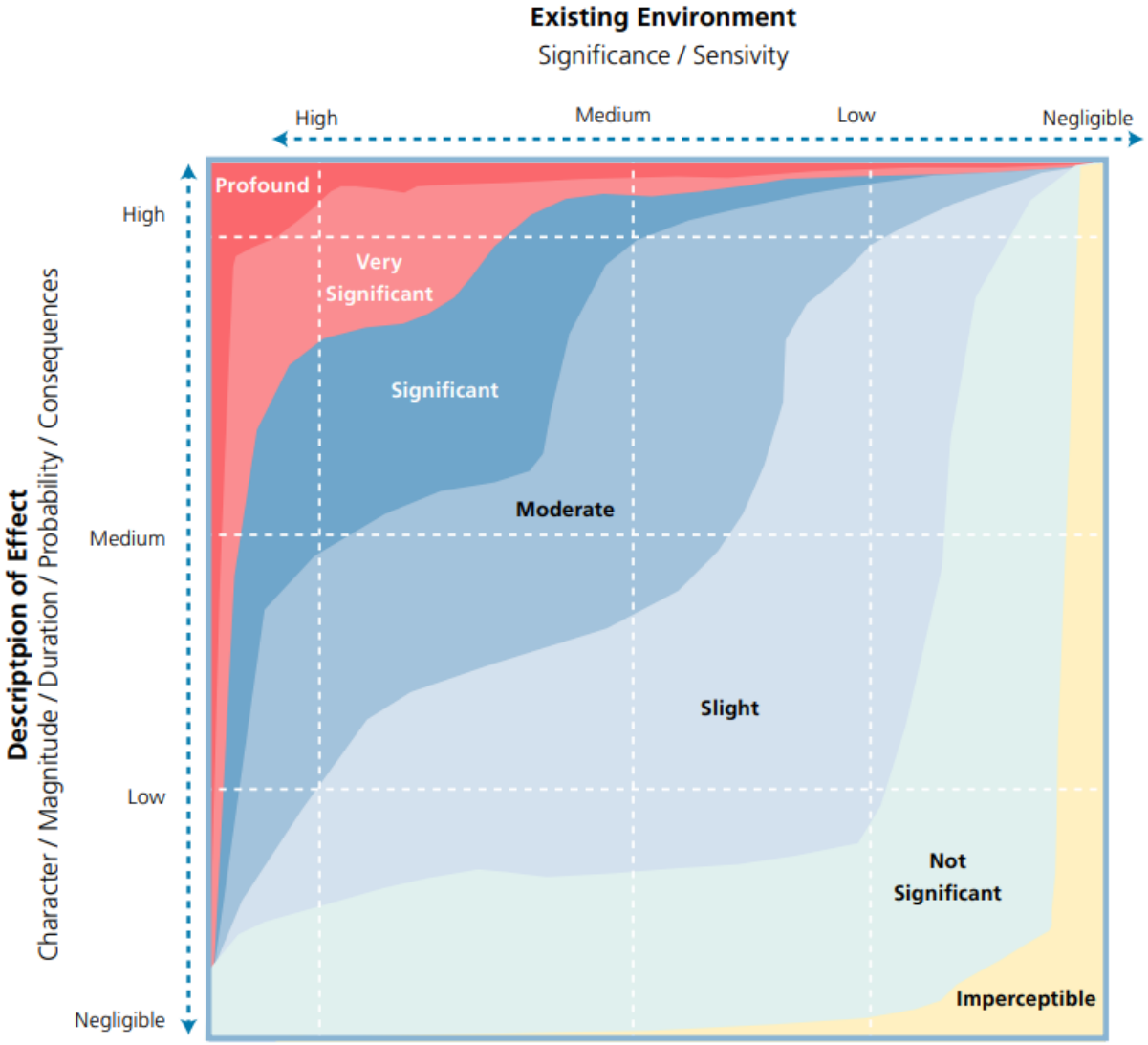


Figure 3-1: Chart showing the typical classifications of the significance of effects (EPA, 2022)

This chart has been interpreted in Table 3-4 as a significance of impacts matrix below, the scale has been ordered into an upper and lower bound for each qualitative category, so that degrees of significance within subcategories can be interpreted by the Competent Person.

Table 3-4: Significance of impacts matrix (derived from Figure 3-1, re EPA, 2022)

Magnitude of impact	Sensitivity/ Value of Receptor							
	High +	**High -**	**Medium +**	**Medium -**	**Low +**	**Low -**	**Negligible +**	**Negligible -**
High +	Profound	Very significant	Very significant	Significant	Moderate	Moderate	Not Significant	Imperceptible
High -	Very Significant	Very significant	Significant	Moderate	Moderate	Slight	Not Significant	Imperceptible
Medium +	Very Significant	Significant	Moderate	Moderate	Slight	Slight	Not Significant	Imperceptible
Medium -	Significant	Moderate	Moderate	Moderate	Slight	Slight	Not Significant	Imperceptible
Low +	Moderate	Slight	Slight	Slight	Slight	Slight	Not Significant	Imperceptible
Low -	Slight	Slight	Slight	Slight	Slight	Not Significant	Not Significant	Imperceptible
Negligible +	Not Significant	Not Significant	Not significant	Not Significant	Not Significant	Not Significant	Not Significant	Imperceptible
Negligible -	Not Significant	Not Significant	Not significant	Not Significant	Not Significant	Imperceptible	Imperceptible	Imperceptible

3.8.3 Residual Impacts

The project is assessed including some designed-in mitigation (e.g., appropriate drainage design). This is done where mitigation is proven to be effective and will be implemented effectively with a high certainty. Where significant residual impacts are still identified, further mitigation measures will be proposed as part of the Ecological Impact Assessment process to avoid, reduce or minimise them. Each impact assessment section assigns a final significance level to the impact described, which considers and includes the implementation of any stated mitigation measures; these are the residual impacts.

3.9 Cumulative Impacts

Potential sources of cumulative impacts were identified based on the ecology of valued ecological features. Potential sources of cumulative impacts were sought within an area where there is the potential for a significant impact on a site or species. The plans and projects identified as potential sources of cumulative impacts are described in Section 5.

3.10 Limitations and Constraints

This EcIA is based on ecological site surveys and existing data from the above-mentioned sources. The report necessarily relies on some assumptions and is inevitably subject to some limitations. These do not affect the conclusion, but the following points are recorded in order to ensure the basis of the assessment is clear:

- Information on the works and conditions on site are based on current knowledge at the time of writing. Changes to the site since surveys were undertaken cannot be accounted for. However, the site surveys have followed CIEEM (2019) Advice note on the lifespan of ecological reports and surveys. Any changes to the proposed works will require an assessment by a suitably qualified ecologist to determine if re-assessment is required.
- Adverse weather can cause delays to the schedule and alter the timing of works. This has been accounted for using a worst-case scenario where possible.
- The absence of species present within online recording can often be associated with the lack of available recording, rather than the absence of species itself.
- The precautionary principle is used at all times when determining potential ecological sensitivity of the site.

4 Baseline Conditions

These baseline conditions present information gathered from existing reports and desk-based sources as detailed in Section 3.6 and the site visit conducted on the 11th of August 2023.

4.1 Desk-based Assessment

4.1.1 Designated Sites

This section includes the designated sites of international and national importance within the Zone of Influence. The ZOI for this project is; noise disturbance (300m); air pollution (500m), ground and surface water pollution (10km), with an additional 15km buffer for hydrologically connected transitional and coastal waters.

Table 4-1 below lists these designated sites with their respective importance and distance from the proposed site development. Figure 4-1 overleaf displays the locations of the statutory designated sites, with Figure 4-2 displaying the non-statutory (proposed and existing Natural Heritage Area) designated sites within the ZoI of the site. Table 4-2 and Table 4-3 displays the site descriptions of the statutory designated sites and non-statutory (proposed and existing Natural Heritage Area) sites and their respective ecological features

Table 4-1: Proximity and importance of designated sites within their respective ZoI buffers.

Name	Designation	Importance	Distance from site	Hydrological Distance from Site
Rye water Valley/Carton [001398]	SAC	International	4.3km	n/a
Glenasmole Valley [001209]	SAC	International	5.7km	n/a
Wicklow Mountains [002122]	SAC	International	9km	n/a
Wicklow Mountains [004040]	SPA	International	8.3km	n/a
North Dublin Bay [000206]	SAC	International	15.2km	24.6km
South Dublin Bay [000210]	SAC	International	15.6km	22.7km
North Bull Island [004006]	SPA	International	15.2km	22.1km
South Dublin Bay and River Tolka Estuary [004024]	SPA	International	4.3km	22.7km
North-West Irish Sea [004236]	cSPA	International	19.6km	24.6km
Slade Of Saggart And Crookling Glen [000211]	pNHA	National	2km	n/a
Grand Canal [002104]	pNHA	National	5.4km	n/a
Lugmore Glen [001212]	pNHA	National	1.6km	n/a
Kilteel Wood [001394]	pNHA	National	8.2km	n/a
Glenasmole Valley [001209]	pNHA	National	4.3km	n/a
Liffey Valley [000128]	pNHA	National	9.5km	n/a
Dodder Valley [000991]	pNHA	National	4.6km	n/a
Rye Water Valley / Carton [001398]	pNHA	National	8.7km	n/a
North Dublin Bay [000206]	pNHA	National	15.3km	23.8km
South Dublin Bay [000210]	pNHA	National	15.2km	23.4km
Dolphins, Dublin Bay [000201]	pNHA	National	16.6km	22.2km

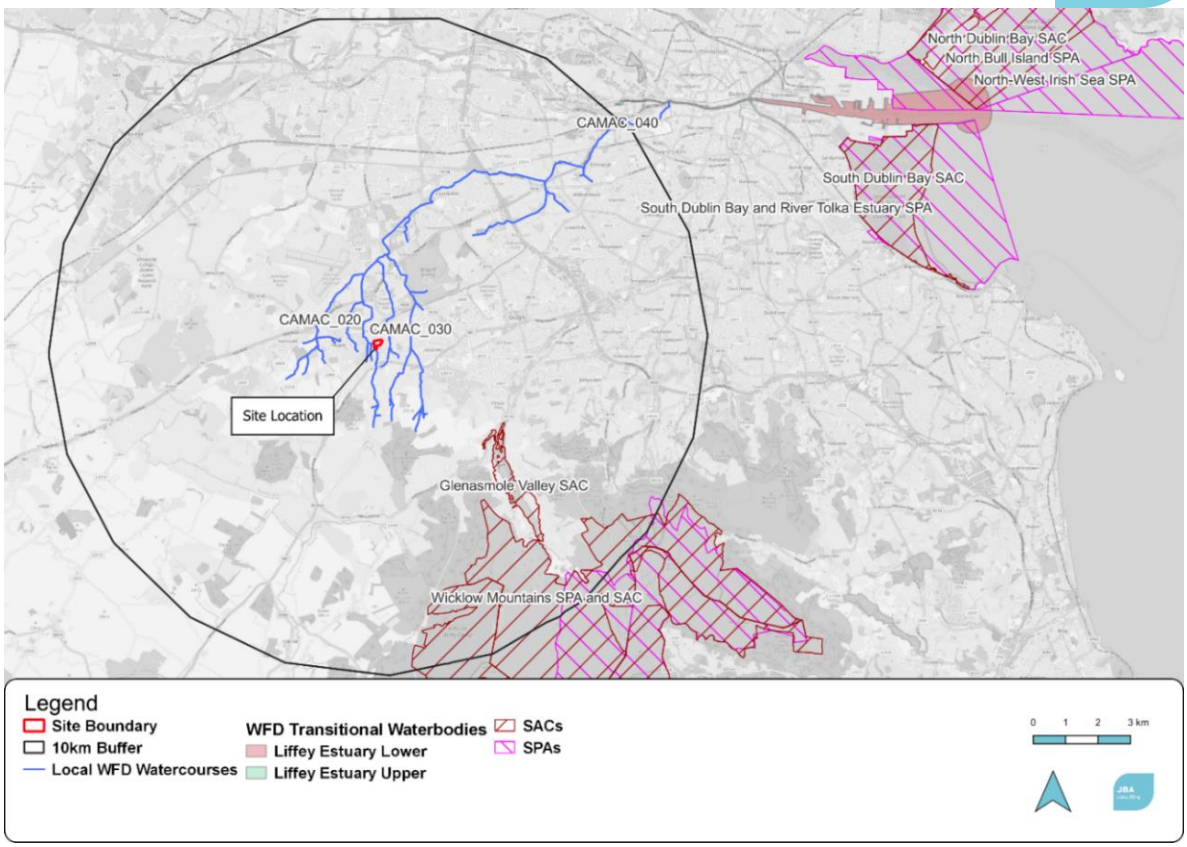


Figure 4-1: Statutory (SAC and SPA_ designated sites within the ZoI of the development (©OpenStreetMap contributors, 2023)

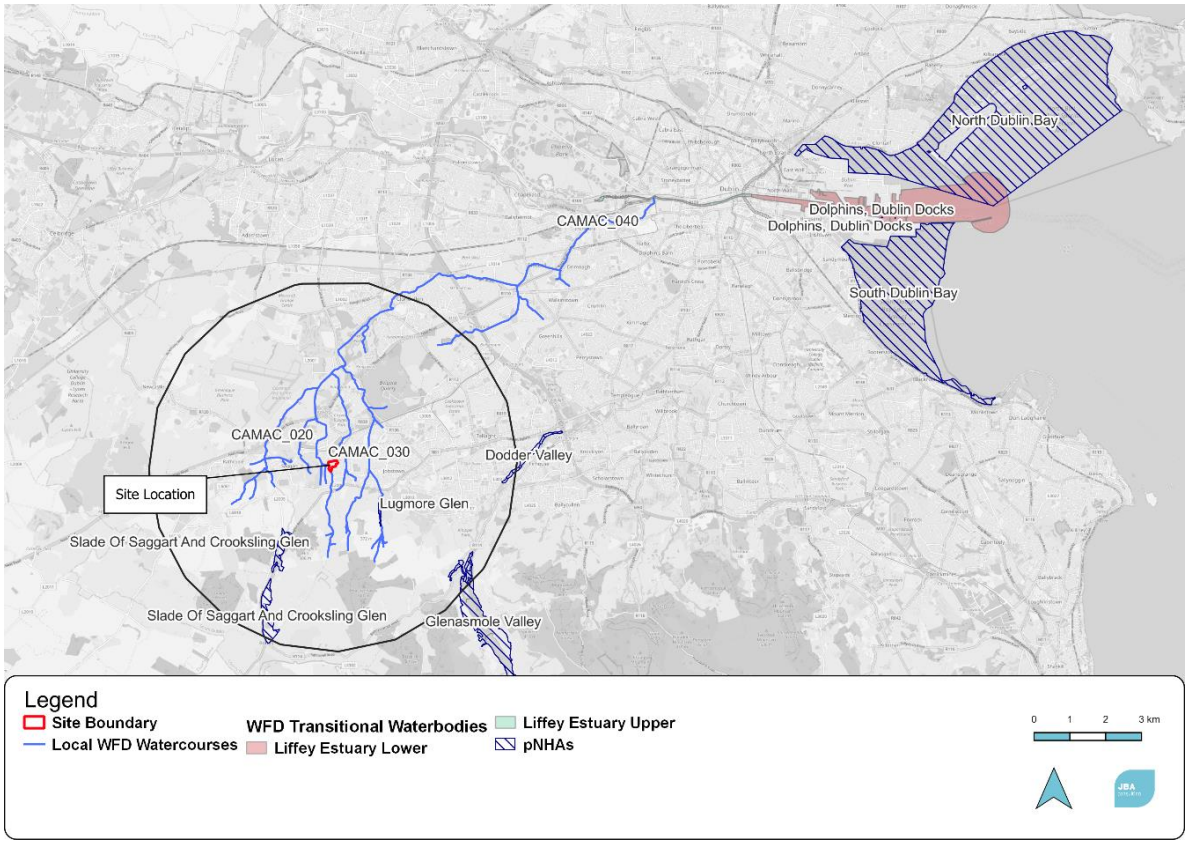


Figure 4-2: Non-statutory(pNHA) designated sites within their respective ZoI of the site works (©OpenStreetMap contributors, 2023)

Table 4-2: Site briefs; Qualifying Interests; and project-relevant threats /pressures and their effects and sources in relation to the Natura 2000 sites within the ZoI (including hydrological connectivity extension)

Site Name	Brief	Qualifying Interests	Project-relevant Threats / Pressures: Impact (Source)
Glenasmole Valley SAC	Glenasmole valley is in south Co. Dublin approximately 5km from Tallaght. The River Dodder has been impounded within the valley to form two reservoirs for water provision to Dublin. The bedrock is non-calcarerous with an overlay of deep drift deposits that line the valley's sides. These areas are covered by scrub and woodland, with herb-rich grassland on the less precipitous parts. Seepage through the deposits brings to the surface water rich in bases and induces patches of calcareous fens and petrifying springs. Locations between the two reservoirs include examples of calcareous fens and flush. Woodland occurs in patches around the site. The east side of the valley forms a woodland on the unstable calcareous slopes. Wet, semi-natural woodland is around the reservoirs. The lake shore vegetation is not well developed (NPWS, 2013a).	- Semi-natural dry grasslands and scrubland facies on calcareous substrates Festuco-Brometalia) (* important orchid sites) [6210] - *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] - Petrifying springs with tufa formation (Cratoneurion) [7220] (NPWS, 2021)	No relevant threats/pressures (EEA, 2018a)
Wicklow Mountains SAC	The Wicklow Mountains SAC is a complex upland region that extends through regions of Co. Wicklow and Dublin. Most of the site is over 300m, with the highest peak reaching 925m high. The mountain shows typical erosion patterns of multiple cycles, with the granite weathered characteristically into broad domes. Much of the west of the site consists of elevated moorland and peat. Surrounding schists have more diverse outlines forming peaks and rocky foothills with deep glens. The majority of the vegetation is a mosaic of wet and dry heaths, blanket bogs, upland grass, dense Bracken and small woodlands along the rivers. The rivers are predominantly acidic due to the underlying rock strata (NPWS 2017a).	- Oligotrophic waters containing very few minerals of sandy plains *Littorelletalia uniflorae* [3110] - Natural dystrophic lakes and ponds [3160] - Northern Atlantic wet heaths with *Erica tetralix* [4010] - European dry heaths [4030] - Alpine and Boreal heaths [4060] - Calaminarian grasslands of the *Violetalia calaminariae* [6130] - Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230] - Blanket bogs (* if active bog) [7130] - Siliceous scree of the montane to snow levels *Androsacetalia alpinae* and *Galeopsietalia ladani* [8110] - Calcareous rocky slopes withchasmophytic vegetation [8210] - Siliceous rocky slopes with chasmophytic	No relevant threats/pressures (EEA, 2018b)

Site Name	Brief	Qualifying Interests	Project-relevant Threats / Pressures: Impact (Source)
		vegetation [8220] - Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] - Otter *Lutra lutra* [1355] NPWS, 2017b	
Wicklow Mountains SPA	The site is upland, comprising of a substantial part of the Wicklow Mountains, mainly confined to Co. Wicklow with a small area lying within Co. Dublin. Most of the site is higher than 300m, with the peak at Lugnaquillia being 925m high. The predominant substrate over the site is peat, with blanket bogs, heaths and upland grasses. Surveys of the Wicklow Mountains SPA have found that up to 9 pairs of Merlin breed within the site at any one year, using the open peatlands as excellent foraging habitats. The cliffs and crags are notable breeding locations for the Peregrine (NPWS, 2014a).	- Merlin *Falco columbarius* [A098] - Peregrine *Falco peregrinus* [A103] (NPWS, 2022)	No relevant threats/pressures (EEA, 2020a)
North Dublin Bay SAC	This SAC extends from the inner part of North Dublin Bay, and primarily focuses on North Bull Island. Dynamic dune systems and saltmarshes are found along this region. A variety of important and rare flora habituate this SAC, including Lesser Centaury, Red Hemp-nettle, and Meadow Saxifrage. North Dublin Bay is also of international importance for waterfowl as it hosts Brent Goose, Knot, Bar-tailed Godwit, Oystercatcher, Ringed Plover, Sanderling, and Dunlin (NPWS, 2013b).	- Mudflats and sandflats not covered by seawater at low tide [1140] - Annual vegetation of drift lines [1210] - *Salicornia* and other annuals colonising mud and sand [1310] - Atlantic salt meadows *Glauco-Puccinellietalia maritimae* [1330] - Mediterranean salt meadows *Juncetalia maritimi* [1410] - Embryonic shifting dunes [2110] - Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] - Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] - Humid dune slacks [2190] - Petalwort *Petalophyllum ralfsii* [1395] (NPWS 2013c)	- Urbanised areas, human habitation (EEA, 2020b).
South Dublin Bay SAC	The intertidal flats at their widest points are 3km with channels existing at largest with Cockle Lake. A small sandy beach occurs near to Dun Laoighre, with an almost entire artificial embankment. The sediments from the Tolka Estuary vary from thixotrophic mud with a high organic content in the inner estuary	- Mudflats and sandflats not covered by seawater at low tide [1140] - Annual vegetation of drift lines [1210] - *Salicornia* and other annuals colonising mud	- Roads, motorways - Urbanised areas, human habitation (EEA, 2020c)

Site Name	Brief	Qualifying Interests	Project-relevant Threats / Pressures: Impact (Source)
	to a well aerated and exposed sand system off of the Bull Wall. Insights show that many birds who winter in South Dublin Bay do not continue towards North Dublin Bay. (NPWS, 2015a)	and sand [1310] - Embryonic shifting dunes [2110] (NPWS 2013d)	
North Bull Island SPA	This site covers all the inner part of north Dublin Bay, with the seaward boundary extending from Bull Wall lighthouse, to Howth Head. The spit in the north is relatively recent, almost 5km long, 1km wide and running parallel to the coast between Clontarf and Sutton. The saltmarsh extends the length of the landward side of the island, providing the main site for wintering bird roosting in Dublin Bay. The wintering waterfowl use two lagoons as their primary feeding grounds, these lagoons are divided by a causeway (NPWS, 2014b).	- Light-bellied Brent Goose *Branta bernicla hrota* [A046] - Shelduck *Tadorna tadorna* [A048] - Teal *Anas crecca* [A052] - Pintail *Anas acuta* [A054] - Shoveler *Anas clypeata* [A056] - Oystercatcher *Haematopus ostralegus* [A130] - Golden Plover *Pluvialis apricaria* [A140] - Grey Plover *Pluvialis squatarola* [A141] - Knot *Calidris canutus* [A143] - Sanderling *Calidris alba* [A144] - Dunlin *Calidris alpina* [A149] - Black-tailed Godwit *Limosa limosa* [A156] - Bar-tailed Godwit *Limosa lapponica* [A157] - Curlew *Numenius arquata* [A160] - Redshank *Tringa totanus* [A162] - Turnstone *Arenaria interpres* [A169] - Black-headed Gull *Chroicocephalus ridibundus* [A179] - Wetland and Waterbirds [A999] (NPWS, 2015b)	- Continuous urbanisation - Other patterns of habitation (EEA, 2020d)
South Dublin Bay and River Tolka Estuary SPA	This site covers a large part of the Dublin Bay, including the intertidal area of the River Liffey and Dun Laoghaire, along with the estuary of the River Tolka to the north of the River Liffey and Booterstown Marsh. The south of the bay has intertidal flats that at their widest extend for almost 3km. The site is important for wintering fowl, integral for the importance of the Dublin Bay complex (NPWS, 2015c).	- Light-bellied Brent Goose *Branta bernicla hrota* [A046] - Oystercatcher *Haematopus ostralegus* [A130] - Ringed Plover *Charadrius hiaticula* [A137] - Grey Plover *Pluvialis squatarola* [A141] - Knot *Calidris canutus* [A143] - Sanderling *Calidris alba* [A144] - Dunlin *Calidris alpina* [A149] - Bar-tailed Godwit *Limosa lapponica* [A157] - Redshank *Tringa totanus* [A162]	- Roads, motorways - Urbanised areas, human habitation (EEA, 2020e)

Site Name	Brief	Qualifying Interests	Project-relevant Threats / Pressures: Impact (Source)
		- Black-headed Gull *Chroicocephalus ridibundus* [A179] - Roseate Tern *Sterna dougallii* [A192] - Common Tern *Sterna hirundo* [A193] - Arctic Tern *Sterna paradisaea* [A194] - Wetland and Waterbirds [A999] (NPWS, 2015d)	
North-West Irish Sea cSPA	The North-west Irish Sea cSPA constitutes an important resource for marine birds, it includes the estuaries and bays that open into it along with the collection of intertidal and subtidal habitats that stretch along the coast. These areas provide habitats for foraging and maintenance for QI seabirds on the north-west Irish Sea's islands and coastal headlines which are important during and outside the breeding period. The site is of conservation interest for many bird species (NPWS, 2023).	- Common Scoter *Melanitta nigra* [A065] - Red-throated Diver *Gavia stellata* [A001] - Great Northern Diver *Gavia immer* [A003] - Fulmar *Fulmarus glacialis* [A009] - Manx Shearwater *Puffinus puffinus* [A013] - Shag *Phalacrocorax aristotelis* [A018] - Cormorant *Phalacrocorax carbo* [A017] - Little Gull *Larus minutus* [A177] - Kittiwake *Rissa tridactyla* [A188] - Black-headed Gull *Chroicocephalus ridibundus* [A179] - Common Gull *Larus canus* [A182] - Lesser Black-backed Gull *Larus fuscus* [A183] - Herring Gull *Larus argentatus* [A184] - Great Black-backed Gull *Larus marinus* [A187] - Little Tern *Sterna albifrons* [A195] - Roseate Tern *Sterna dougallii* [A192] - Common Tern *Sterna hirundo* [A193] - Arctic Tern *Sterna paradisaea* [A194] - Puffin *Fratercula arctica* [A204] - Razorbill *Alca torda* [A200] - Guillemot *Uria aalge* [A199]	No published threats or pressures by NPWS to date.

* = priority Annex I habitat

= indirect threat via the increase in the local populace and recreational activities as a result of the development

Table 4-3: Site briefs and ecological features of conservation concern of proposed Natural Heritage Areas within the ZoI.

Site Name	Brief	Ecological Features of Conservation Concern
Slade Of Saggart And Crookling Glen pNHA	This site is located in the south-west of Co. Dublin and stretches from Brittas northwards to approximately 2km south of Saggart. The northern half of the site comprises a river valley with steep tree-covered sides, while the southern side is flatter and contains two small lakes, the Brittas Ponds. The trees are mostly of planted origin with fine specimens of Beech *Fagus sylvatica*, Ash *Fraxinus excelsior*, Oak *Quercus* spp. and Birch *Betula* spp.; with some Whitebeam *Sorbus hibernica* also occurring. The flora of the site is notable for the presence of the rare Red Data Book species, Yellow Archangel *Lamiastrum galeobdolon*. South of Crooksling Glen are Brittas Ponds, a Wildfowl Sanctuary, that supports a variety of wildfowl, including Teal, Mallard, Pochard and Tufted Duck (NPWS, 2009a).	- Whitebeam *Sorbus hibernica* - Yellow Archangel *Lamiastrum galeobdolon* - Teal *Anas crecca* - Mallard *Anas platyrhynchos* - Pochard *Aythya ferina* - Tufted Duck *Aythya fuligula*
Grand Canal pNHA	The Grand Canal is a man-made waterway linking the River Liffey at Dublin with the Shannon at Shannon Harbour and the Barrow at Athy. The Grand Canal proposed Natural Heritage Area (pNHA) comprises the canal channel and the banks on either side of it. A number of different habitats are found within the canal boundaries - hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland. The diversity of the water channel is particularly high in the eastern section of the Main Line - between the Summit level at Lowtown and Inchicore. Otter spraints are found along the towpath, particularly where the canal passes over a river or stream. The Smooth Newt *Lissotriton vulgaris* breeds in the ponds on the bank at Gollierstown in Co. Dublin. The rare and legally protected Opposite-leaved Pondweed *Groenlandia densa* (Flora Protection Order 1987) is present at a number of sites in the eastern section of the Main Line, between Lowtown and Ringsend Basin in Dublin (NPWS, 2009b).	- Otter *Lutra lutra* - Smooth Newt *Lissotriton vulgaris* - Opposite-leaved Pondweed *Groenlandia densa*
Lugmore Glen pNHA	This small wooded glen is located about 2km south-east of Saggart in Co Dublin. It is quite a narrow valley cut in glacial drift. A small stream winds through the valley. The wood is mainly comprised of dense Hazel *Corylus avellana* but also contains Ash, Elder *Sambucus nigra* and Blackthorn *Prunus spinosa*. The herb layer is quite rich, especially towards the stream, with species such as Wood-sorrel, Bugle *Ajuga reptans*, Primrose *Primula vulgaris*, Honeysuckle *Lonicera periclymenum*, Bluebell *Hyacinthoides non-scripta*, Ivy *Hedera hibernica*, Wood-sedge *Carex sylvatica,* Woodruff *Galium odoratum* and Wood Speedwell occurring. The importance of this site is that it is a fine example of a wooded glen with a good representation of woodland plants. The flora of the site is notable for the presence of the rare Red Data Book species, Yellow Archangel.	- Yellow Archangel *Lamiastrum galeobdolon*
Kilteel Wood pNHA	This site is located about 10km north-east of Naas and immediately east of the village of Kilteel. The wood is situated on a hill which rises to 248m. The site is a small heathy wood mostly of Oak *Quercus* spp. and Downy Birch *Betula pubescens*. Other trees present include Beech, Sycamore *Acer pseudoplatanus*, Ash and Scots Pine *Pinus sylvestris*. In a clearing gorse *Ulex europaeus, U. gallii* and Heather *Calluna vulgaris* occur. The ground vegetation is restricted, with the following species – Bilberry *Vaccinium myrtillus*, Bluebell, Greater Stitchwort *Stellaria holostea*, Wood Sage *Teucrium scorodonia*, Heath Bedstraw *Galium saxatile*, Red Fescue *Festuca rubra*, Wavy Hair-grass *Deschampsia flexuosa* and Creeping Soft-grass *Holcus mollis*. This site is a fine example of a largely deciduous wood (NPWS, 2009c).	- General: Good quality deciduous woodland

Site Name	Brief	Ecological Features of Conservation Concern
Glenasmole Valley pNHA	As per the Natura 2000 SAC description.	As per those outlined in Natura 2000 SAC description.
Liffey Valley pNHA	The Liffey Valley site is situated along the River Liffey between Leixlip Bridge on the Kildare-Dublin border and downstream of the weir at Glenaulin, Palmerstown, Co. Dublin. The river is a Salmon river and there are a series of weirs along the river between Palmerstown and Leixlip. The main terrestrial habitat included within the site is mixed deciduous woodland on fertile, limey alluvium and boulder clay, in which Beech is dominant in some areas. These woodlands occur on both sides of the river and normally consist of old estate woodlands. A wet marsh occurs on the strip of land between the Mill Race and the river east of the metal bridge and west of the paint factory. This marsh is fed by seepage from the Mill Race and plant species such as Bulrush T*ypha latifolia*, Marsh-marigold *Caltha palustris* and Sweet-grass *Glyceria* spp. occur here. The threatened Green Figwort *Scrophularia umbrosa*, a species listed in the Irish Red Data Book, is recorded from a number of stations along the river within the site. The rare and legally protected Hairy St. John's-wort *Hypericum hirsutum* (Flora Protection Order 1987) has been recorded from the woodlands in this site. The threatened Yellow Archangel, listed in the Irish Red Data Book, is also recorded from these woodlands (NPWS, 2009d).	- Atlantic Salmon *Salmo salar* - Green Figwort *Scrophularia umbrosa* - Hairy St. John's-wort *Hypericum hirsutu* - Yellow Archangel *Lamiastrum galeobdolon*
Dodder Valley pNHA	This stretch of the River Dodder extends for about 2 km between Firhouse Bridge and Oldbawn Bridge in the south-west of Dublin City. The vegetation consists of woodland scrub mainly comprising Willows spp., but up to thirteen species of tree have been recorded. The understorey vegetation contains a good variety of plant species, including Early-purple Orchid *Orchis mascula* and Bugle. Along the banks there are wildflower meadows with a good diversity of plant species. Forty-eight bird species have been recorded recently in the area, including Little Grebe *Tachybaptus ruficollis*, Kingfisher *Alcedo atthis*, White-throated Dipper *Cinclus cinclus* and Grey Wagtail *Motacilla cinerea*. Part of the riverbank supports a Sand Martin *Riparia riparia* colony of up to 100 pairs. The site also supports a population of Otter. The site represents the last remaining stretch of natural riverbank vegetation on the River Dodder in the built-up Greater Dublin Area (NPWS, 2009e).	- Little Grebe *Tachybaptus ruficollis* - Kingfisher *Alcedo atthis* - Grey Wagtail *Motacilla cinerea* - Sand Martin *Riparia riparia* - Otter *Lutra lutra*
Rye Water Valley / Carton pNHA	As per the Natura 2000 SAC description.	As per those outlined in Natura 2000 SAC description.
North Dublin Bay	As per North Dublin Bay SAC description in Table 4-2.	As per those outlined in Natura 2000 SAC description.
South Dublin Bay	As per South Dublin Bay SAC description in Table 4-2.	As per those outlined in Natura 2000 SAC description.
Doplhins, Dublin Bay	As per Red Bog, Kildare SAC descriptions in Table 4-2.	As per those outlined in Natura 2000 SPA description.

4.1.2 Screening of designated sites

An AA Screening has been carried out for this project by JBA (2023). Following initial screening, and based upon best scientific judgement it is concluded that **adverse significant effects are not anticipated** from the project on the following Natura 2000 sites within the Zone of Influence:

- Glenasmole Valley SAC [001209]
- Wicklow Mountains SAC [002122]
- Wicklow Mountains SPA [004040]
- North Dublin Bay SAC [000206]
- South Dublin Bay SAC [000210]
- North Bull Island SPA [004006]
- South Dublin Bay and River Tolka Estuary SPA [004024]
- North-West Irish Sea SPA [004236]

The pNHA sites below, are being **screened out** due one or more of the following: lack of hydrological connectivity (surface water and groundwater) and/or distance from the proposed site; and the development's scale (capacity for dust generation):

- Slade Of Saggart And Crookling Glen [000211]
- Grand Canal [002104]
- Lugmore Glen [001212]
- Kilteel Wood [001394]
- Glenasmole Valley [001209]
- Liffey Valley [000128]
- Dodder Valley [000991]
- Rye Water Valley / Carton [001398]
- North Dublin Bay [000206]
- South Dublin Bay [000210]
- Dolphins, Dublin Bay [000201]

4.1.3 Protected Species

National Biodiversity Data Centre (NBDC)

Records of protected flora and fauna including invertebrates, amphibians, fish, birds and mammals collated from the NBDC (2023) database, present within the surrounding 5km within the past 10 years are listed in Appendix D. This list includes their level of protection, if they are red or amber listed on the International Union for the Conservation of Nature and Natural Resources (IUCN) Red List or the Birds of Conservation Concern in Ireland (2020-2026) and the date of the last record of this species at this location.

4.1.4 Invasive Non-native Species

The records from the NBDC (2023) database, show that there are four high-impact, and one medium impact, invasive non-native species listed on the Third Schedule of Non-native species (subject to restrictions under Regulations 49 and 50) present within the 2km buffer zone of the proposed site within the past 10 years (Table 4-4).

Table 4-4: High and Medium impact invasive non-native species within 2km of the proposed site

Invasive Non-native Species	Proximity to site	Impact Status
Fringed Water-lily *Nymphoides peltata*	1.1km	High Impact
Japanese Knotweed *Fallopia japonica*	1km	High Impact

Invasive Non-native Species	Proximity to site	Impact Status
Giant Hogweed *Heracleum mantegazzianum*	1.4km	High Impact
Three-cornered Garlic *Allium triquetrum*	2km	Medium Impact
Brown Rat *Rattus norvegicus*	Within site	High Impact

4.2 Water Framework Directive

4.2.1 Surface water status

The entirety of the proposed project is located within the Water Framework Directive (WFD) Liffey and Dublin Bay catchment, and within the Liffey_SC_090 sub-catchment (EPA, 2023). The Corbally Stream, which is a tributary of the WFD watercourse Camac_020 (Moderate Status), is located along the south-west boundary of the site. There is a ditch network associated with this stream present throughout site, before flowing east to the join the Baldonnell Upper, which is a second tributary of the Camac_020.

Both of these tributaries of the Camac flow north, before joining the Camac_030 (Poor Status), which flows north-east before reaching the Liffey Estuary Upper (Status for Review), and joining the Liffey Estuary Lower (Moderate Status), and into Dublin Bay. All of these waterbodies are currently listed as being "At Risk" and are shown in both Figure 4-3 and Figure 4-4.

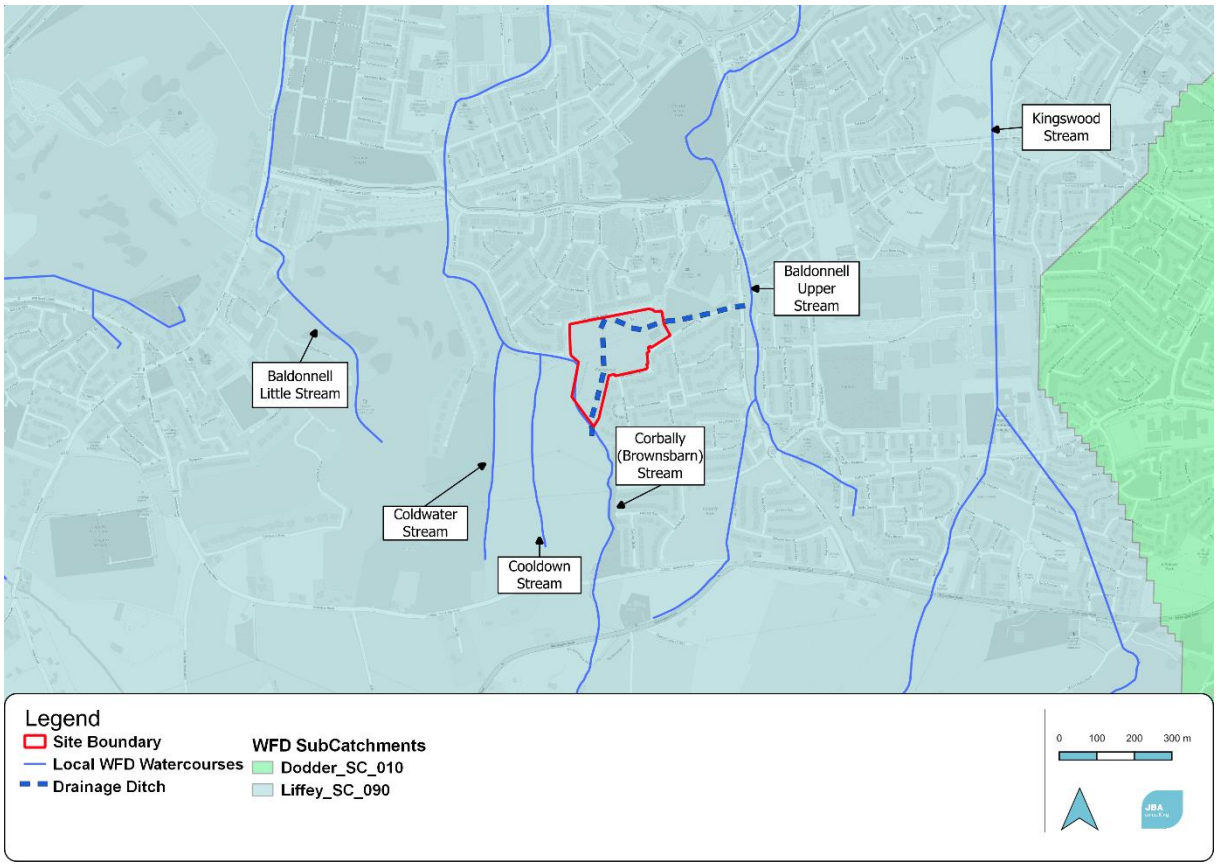


Figure 4-3: Local surface water network (OSM, 2023)

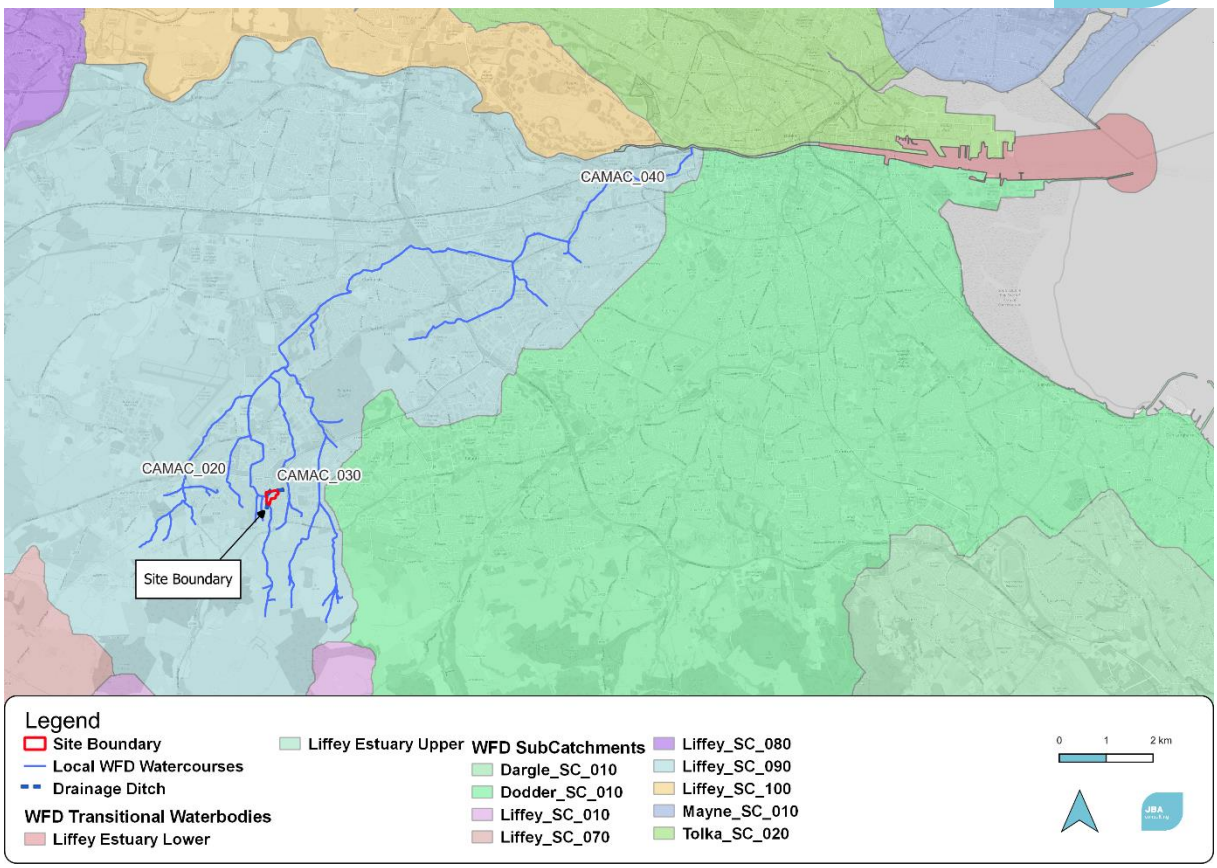


Figure 4-4: Freshwater and transitional watercourses hydrologically linking the site with Dublin Bay

4.2.2 Groundwater

The majority of the site is located within the Dublin groundwater body, however, the southernmost tip of the site extends into the Kilcullen groundwater body (Figure 4-5). The Dublin groundwater body's risk status is considered to be "Under Review", while the Kilcullen groundwater body is considered to be "At Risk", while both of these groundwater bodies currently hold a "Good" WFD (2016 - 2021) Status (EPA, 2023).

The underlying bedrock of the site is dominated by Dark limestone & shale (`calp) of the Lucan Formation, while the southern point of the site is underlain with Coarse greywacke & shale of the Poulaphouca Formation. These two bedrock sections are separated by a fault line. The entirety of the site is Till derived from limestones. The permeability of all the site's area is classified as Low, with a low recharge capacity of 7.5%, and the groundwater of the site has an overall Low vulnerability (Figure 4-6, overleaf).

The aquifer underlying the majority of the site's bedrock is considered to be Locally Important Aquifer - Bedrock, which is Moderately Productive but only in Local Zones; and while the bedrock at the southernmost tip is considered to be Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones. Therefore, the majority of the site is underlain with an aquifer with limited connection of fractures, fissures, and joints which results in low permeability. In general, the limited connection of fissures and joints leads to poor storage and limited flow paths of only a few hundred meters. The aquifer in the southernmost tip of the site is slow to flow and also exhibits a poor network of fractures, fissure and joints, and a low level of retention or transferral within the groundwater.

Overall, in context of the site, there is a low permeability, and low retention within the groundwater, and discharge is limited and occurs at short distances, resulting in low-level water discharge into the local waterbodies.

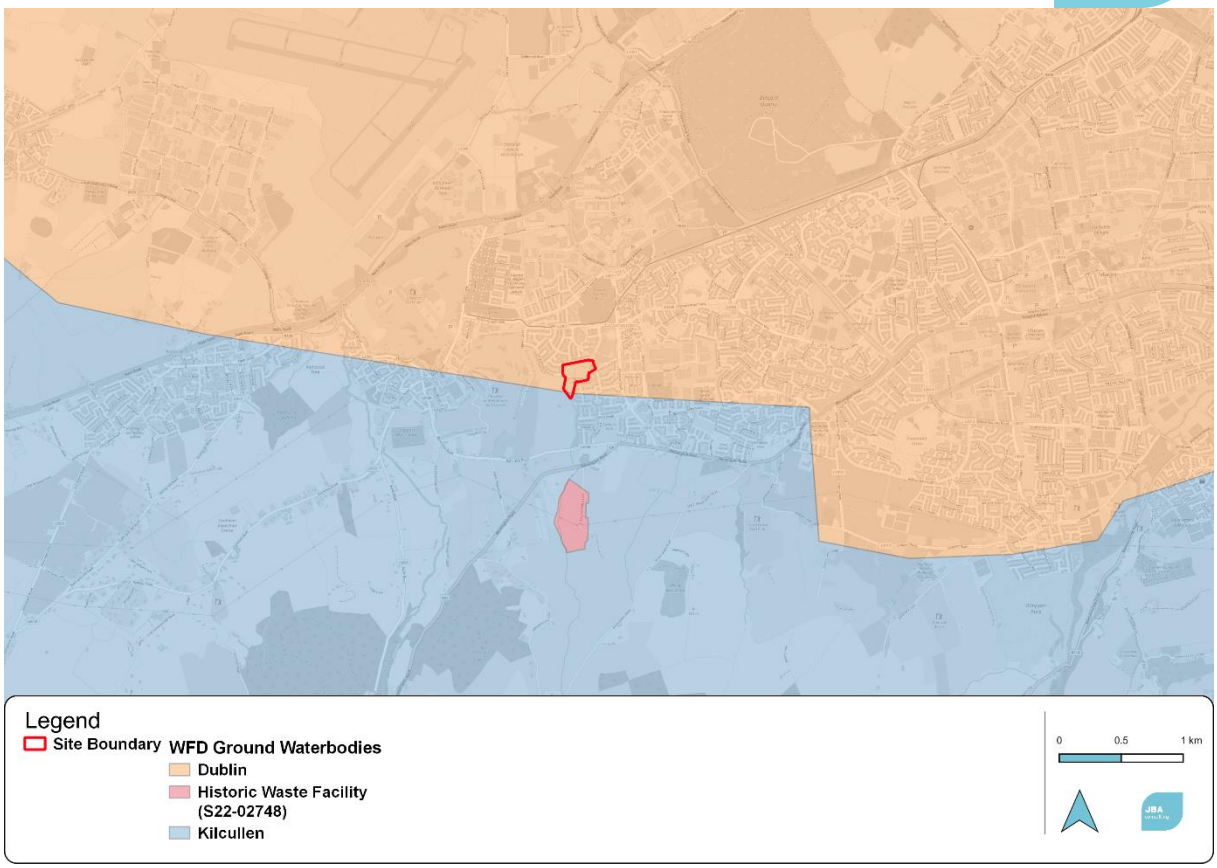


Figure 4-5: Groundwater bodies in the vicinity of site (OSM, 2023)

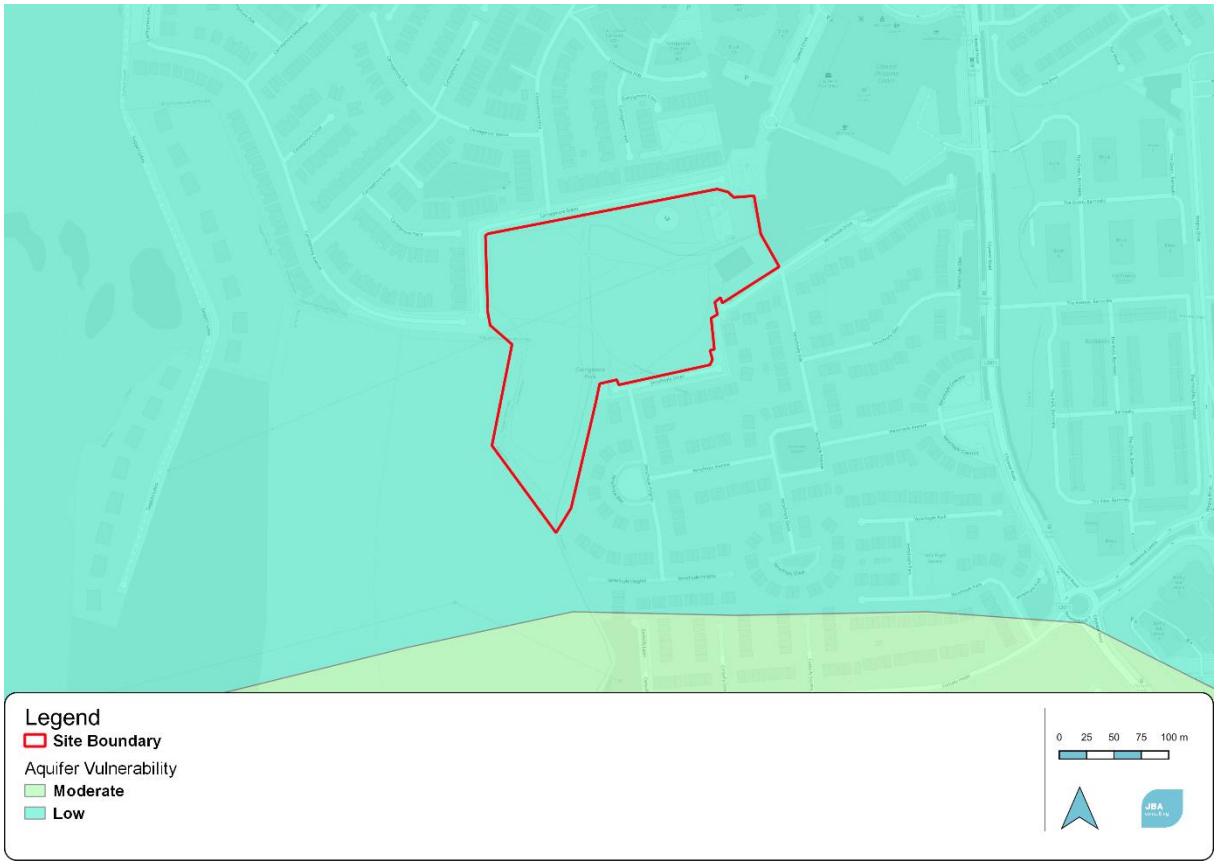


Figure 4-6: Aquifer vulnerability of the site (OSM, 2023)

4.3 Site Visits

A baseline ecological site walkover, including habitat mapping, was conducted by JBA Ecologists, William Mulville and Michael Coyle on the 11th of August 2023, while additional mammal surveys and walking bat transect was completed on the 29th of August by JBA Ecologists Mark Desmond and Dominic Tilley. Descriptions of habitats and species are provided in the sections below.

4.4 Habitats

The value of each habitat is based on the site visit. Habitats recorded in and around the site boundary were recorded and are displayed in Table 4-5 below and Figure 4-7.

Carrigmore Park is listed as one of SDCC's "Short meadow locations" (SDCC, 2023), however at the time of the ecological site survey, the area allocated for the meadow was absent of meadow qualities and was instead characterised by traits associated with amenity grassland.

Table 4-5: Habitats recorded during site visit.

Fossitt Habitat	Fossitt Code
Buildings and artificial surfaces	BL3
Eroding/upland rivers	FW1
Drainage Ditches	FW4
Amenity grassland (improved)	GA2
Dry meadows and grassy verges	GS2
Hedgerows	WL1
Treelines	WL2
Treelines / Hedgerows	WL2 / WL1

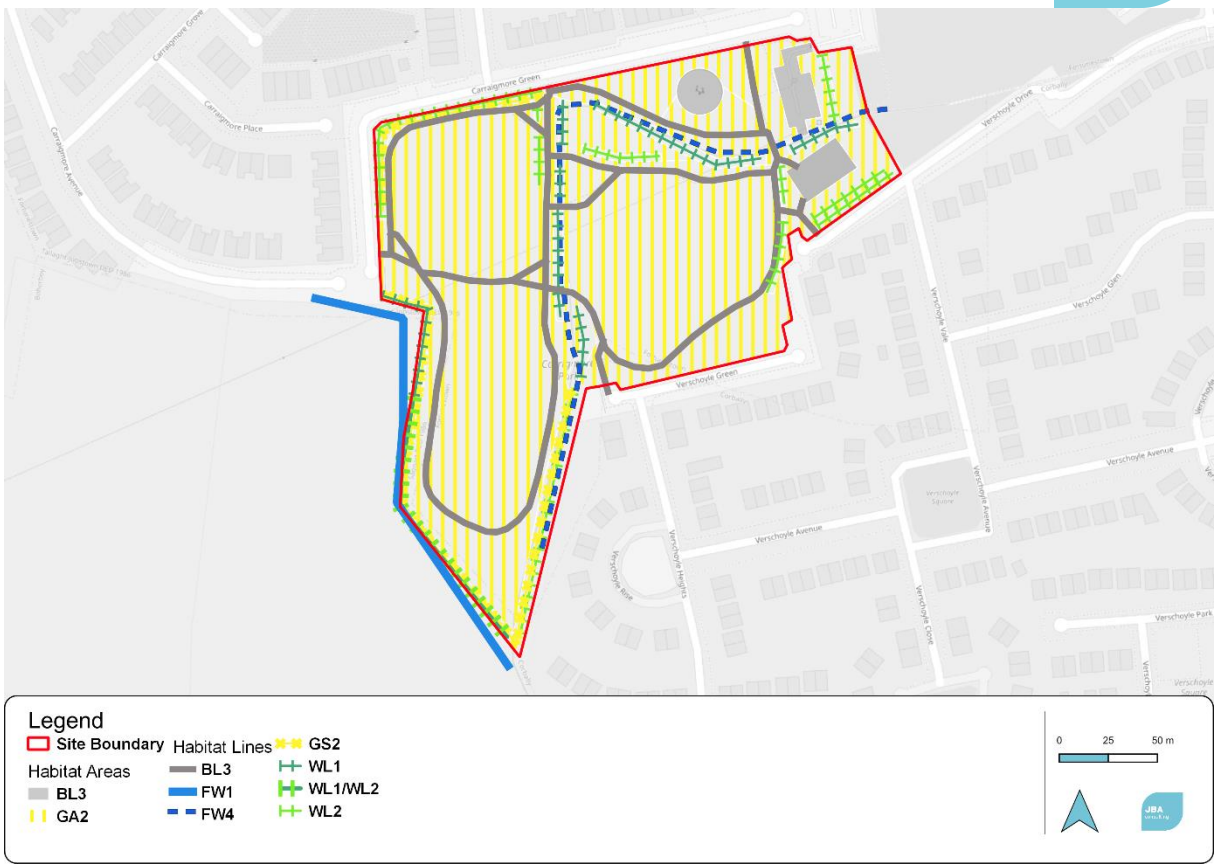


Figure 4-7: Habitat Map (© OpenStreetMap contributors, 2023)

4.4.1 Buildings and artificial surfaces - BL3

The artificial surfaces within the site boundary include the footpath located throughout the park, the playground area, the car park, and the basketball court on site. There were no species recorded within these sections.

In the context of this site and the lands immediately adjacent, these artificial habitats are considered to be of **less than local ecological importance** given its low biodiversity value for floral species and lack of foraging potential for fauna.

4.4.2 Eroding/upland rivers - FW1

The Corbally Stream runs along the south-west boundary of the site, and creates a seasonal wetland in the area, as the stream floods the area west of site. This stream connects to the main body of the River Camac downstream.

This area floods frequently (Figure 4-8), and a Heron *Ardea cinerea* was seen foraging within this area. This stream was checked for signs of the QI species Otter *Lutra lutra*, however there was no evidence that Otter utilise this site.

Figure 4-8: The Corbally Stream west of the site, having flooded the adjacent area

In the context of this site and the lands immediately adjacent, this stream habitat is considered to be of **high local ecological importance** given potential of foraging and refuge for local fauna including amphibians and birds, along with its connection to the River Camac which contains riverine species such as White-clawed Crayfish *Austropotamobius pallipes* and various fish species.

4.4.3 Drainage ditches - FW4

A dry ditch was recorded underneath the shorter, segmented sections of hedgerow that are located throughout the centre of the site. Along this dry ditch are species Field Horsetail *Equisetum arvense,* Large Bindweed *Calystegia silvatica*, Climbing Nightshade *Solanum dulcamara*, Lords-and-Ladies *Arum maculatum*, and Hedge Mustard *Sisymbrium officinale*.

This ditch is less likely to be dry during the wetter periods of the year, Autumn - Spring inclusive. In the context of the site and the lands immediately adjacent, this ditch habitat is considered to be **high local ecological importance** given its potential for sheltering and spawning of fauna.

4.4.4 Amenity grassland (improved) - GA2

The majority of the site includes areas of amenity grassland, with floral species including Perennial Rye-grass, Dandelion *Taraxacum* spp., Creeping Buttercup *Ranunculus repens*, Ragwort *Jacobaea vulgaris*, Hogweed *Heracleum sphondylium*, Red Clover *Trifolium pratense*, White Clover *Trifolium repens*, Curly Dock *Rumex crispus*, Daisy *Bellis perennis*, Ribwort Plantain *Plantago lanceolata*, Cow Parsley *Anthriscus sylvestris*, Broad-laved Dock *Rumex obtusifolius*, Common Bird's-foot Trefoil *Lotus corniculatus*, Creeping Cinquefoil *Potentilla reptans*, Silverweed *Potentilla anserina* and Self-heal *Prunella vulgaris* .

Present within the amenity grassland were small flocks of Starling *Sturnus vulgaris*.

In the context of the site and the lands immediately adjacent, this managed grassland habitat is considered to be of **less than local ecological importance** given its low biodiversity and low foraging potential for fauna.

4.4.5 Dry meadows and grassy verges - GS2

There are several thin grassy verges, approximately 1m wide, that are located along sections of the site boundary, which continue along the base of the hedgerow and mature treelines along the site boundary (Figure 4-9). The species within these grassy verges include Perennial Rye-grass *Lolium perenne*, Cock's Foot *Dactylis glomerata*, Lesser Stitchwort *Stellaria graminea*, White Clover, Red Clover, Common Plantain *Plantago major*, Ribwort Plantain, Dandelion., Nettle *Urtica dioica*, Creeping Thistle *Cirsium vulgare*, Bush Vetch *Vicia sepium*, Creeping Buttercup, Red Bartsia *Odontites vernus*, Hogweed, False Oat-grass, Ragwort, Cow Parsley, Cleaver *Galium aparine*, Curly Dock, Butterbur *Petasites hybridus*, Hedge Woundwort *Stachys sylvatica*, Herb Robert *Geranium robertianum*, Field

Horsetail , Common Knapweed *Centaurea nigra*, Nipplewort *Lapsana communis*, Colt's Foot *Tussilago farfara*, Chickweed *Stellaria media*, Yorkshire Fog *Holcus lanatus*, Spear Thistle *Cirsium vulgare*, Silverweed, Great Willowherb *Epilobium hirsutum*, Rosebay Willowherb *Chamaenerion angustifolium*, Greater Bird's-foot Trefoil *Lotus pedunculatus*, and Grey Willow *Salix cinerea* saplings.

Figure 4-9: The grassy verge along the base of the hedgerow in the west of the site.

Throughout the central hedgerows within the site, there are also some grassy verge species present. These include Nettle, Colt's Foot, Butterbur, Cock's Foot, Bush Vetch, American Willowherb *Epilobium ciliatum*, Silverweed, Daisy, Lords-and-ladies, Dock, Hedge Mustard and Ragwort.

In the context of the site and the lands immediately adjacent, this habitat is considered to be of **high local ecological importance** given its areas of locally higher floral biodiversity and foraging potential for fauna.

4.4.6 Hedgerows - WL1

There is one hedgerow that is located along the western boundary of the site and continues south before transitioning into a Treeline habitat. The tree and shrub species within this habitat include Grey Willow, Gorse *Ulex europaea*, Bramble *Rubus fructicosus agg.*, Hawthorn *Crataegus monogyna*, Elder *Sambucus nigra* and Sycamore *Acer pseudoplatanus*, while there is also a light layer of Ivy *Hedera helix* growth on this vegetation.

Foraging along this hedgerow boundary, bird species such as Blue Tit *Cyanistes caeruleus*, Song Thrush *Turdus philomelos* and House Sparrow *Passer domesticus* were noted, as well as invertebrate species such as Honeybee *Apis mellifera* and butterfly species Holly Blue *Celastrina argiolus* and Large White *Pieris brassicae*.

There are smaller sections of interspersed hedgerows located throughout the centre of the site. These hedges include the tree and shrub species Hawthorn, Elder and Bramble, while they also include herbaceous species such as Large Bindweed, Climbing Nightshade, Lords-and-Ladies, and Hedge Mustard.

In the context of the site and the lands immediately adjacent, this habitat is considered to be of **high local ecological importance** given the shrubs and trees that provide foraging capabilities for local mammals, birds and invertebrates, nesting capabilities for local birds, and commuting and foraging opportunities for local bats.

4.4.7 Treelines - WL2

There are two mature treelines, one is located along the south border of the site (Figure 4-10) while the other is in the north-east of the site next to the car park, which contain mature tree species Grey Willow, Bramble, Hawthorn, Elder and Sycamore.

Figure 4-10: Mature treeline along the south of the site

Within the main body of the park, located along the boundaries of the grasslands are planted treelines of Pedunculate Oak *Quercus robur*, Field Maple *Acer campestre*, Norwegian Maple *Acer platanoides*, Crab Apple *Malus sylvestris*, Lime *Tillia cordata*, and Hornbeam *Carpinus betulus*.

In the context of the site and the lands immediately adjacent, this habitat is considered to be of **high local ecological importance** given the shrubs and trees that provide foraging capabilities for local mammals, birds and invertebrates, nesting capabilities for local birds, and commuting and foraging opporutnities for local bats.

4.4.8 Treelines / Hedgerows - WL2 / WL1

There is a section of the south-western boundary of the site which has a transitional section of Hedgerow into Treeline as a result of the trees maturing and growing into a larger canopy section (Figure 4-11).

Figure 4-11: The transition of the hedgerow into a mature treeline along the west boundary.

In the context of the site and the lands immediately adjacent, this habitat is considered to be of **high local ecological importance** given the shrubs and trees that provide foraging capabilities for local mammals, birds and invertebrates, nesting capabilities for local birds, and commuting and foraging opportunities for local bats.

4.5 Protected Flora

No protected floral species were recorded by the JBA Ecologist during the ecological walkover survey of the proposed site. Furthermore, the NBDC shows no record of any protected flora species being present within site or its immediate vicinity (NBDC, 2023).

4.6 Protected Fauna

4.6.1 Mammals

There was no evidence of mammal species listed under the Wildlife Act 1976 (and amendments) or the EU Habitats Directive recorded by the JBA Ecologists during the ecological walkover survey. The following mammals are recorded within 2km of the site within recent years, while there is a list of previously reported species within a 5km radius of the site is found in the Appendix D

- Red Squirrel *Sciurus vulgaris*
- Badger *Meles meles*
- Hedgehog *Erinaceus europeaus*

While there was no evidence of these species on-site there is the potential for them to present in the locality; therefore, under the precautionary principal, they will be examined in the mitigation section of this report. The proposed site is considered to be of **high local ecological importance** for these mammals.

4.6.2 Bats

Desk Study

No bat species protected under the Wildlife Act and/or the EU Habitats Directive that have been recorded under the NBDC within 2km of the site in the previous 10 years, however this is potentially due to the lack of reporting rather than the lack of activity. Additional bat records within 5km of the site include Soprano Pipistrelle *Pipistrellus pygmaeus* and Daubenton's Bat *Myotis daubentonii*.

Preliminary Bat Roost Survey

During the ecological walkover of the proposed site, there were no features suitable for roosting present on site, however it was noted that there were a number of suitable foraging habitats in the area of the parkland, and as such a bat activity survey was conducted to assess activity levels.

Bat presence / activity on-site

JBA Ecologists Mark Desmond and Dominic Tilley conducted a walking transect survey on the 29th of August 2023, taking place on a transect surrounding the grassland areas of the park. During this transect survey, Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat were recorded (Figure 4-12).

During the week from the 29th of August to the 4th of September 2023, a static detector survey was undertaken by JBA. The Static detector was installed on a tree in the southern tip of the site, and oriented in an eastward's direction towards the treeline boundary (Figure 4-12). The species recorded during this period include Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat and Brown Long-eared Bat activity recorded. Additionally, there were multiple recordings of Brandt's Bat and/or Whiskered Bat, however, due to the similarity of their calls, these species cannot be differentiated from bat static readings, and it is possible that either one or both species were utilising the site. Records of each day of static activity is presented in Table 4-6.

The proposed site has been valued as being **of high local ecological importance** for bats, given the foraging and commuting potential within the treelines and hedgerows.

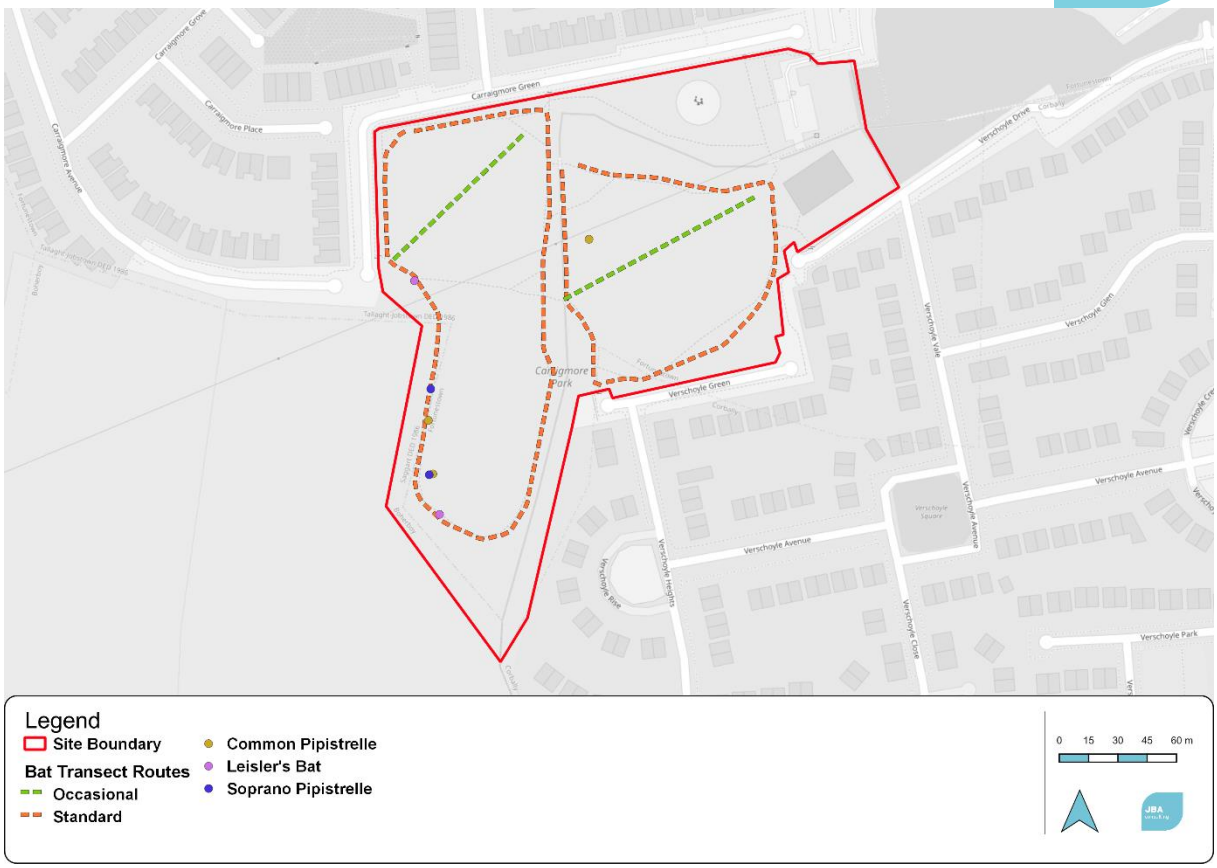


Figure 4-12: Bat transect route and species encountered during the transect survey

Table 4-6: Bats recorded during the static deployment.

	29th July	30th July	31st July	1st September	2nd September	3rd September	4th September	Total
Common Pipistrelle	9	22	20	33	16	37	72	**209**
Soprano Pipistrelle	7	45	15	96	22	43	212	**440**
Leisler Bat	1	0	1	5	1	0	3	**11**
Brandt's Bat and/or Whiskered Bat	0	0	2	3	4	4	3	**16**
Brown Long Ear	0	0	4	1	0	0	1	**6**
Total	**17**	**67**	**42**	**138**	**43**	**84**	**291**	**682**

4.6.3 Breeding and Wintering Birds

Bird of Conservation Concern (BoCCI, Gilbert et al., 2021) recorded during the ecological habitat survey include Blue Tit and Song Thrush, which are both listed on the BoCCI Green list, two small flocks of Starling and House Sparrow, which are both listed on the BoCCI Amber list. Additionally, Long-eared Owl *Asio otus* was recorded during the bat transect survey on the 29th of August, which is also listed on the Green list.

In addition to birds encountered on site, NBDC details recent records of birds of conservation concern listed on the BoCCI Amber list within a 2km radius include Barn Swallow *Hirundo rustica* (Breeding), Sand Martin *Riparia riparia* (Breeding), Tufted Duck *Aythya fuligula* (Breeding and Wintering), Black-headed Gull *Larus ridibundus* (Breeding and Wintering), Common Coot *Fulica atra* (Breeding and Wintering), Mallard *Anas platyrhynchos* (Breeding and Wintering), Starling *Sturnus vulgaris* (Breeding), House Martin *Delichon urbicum* (Breeding), Northern Wheatear *Oenanthe oenanthe* (Breeding), Kingfisher *Alcedo atthis* (Breeding) and Goldcrest *Regulus regulus* (Breeding).

Within this 2km radius, there also includes the Red List species Swift *Apus apus* (Breeding) and Grey Wagtail *Motacilla cinerea* (Breeding).

While not listed as birds of concern within Ireland, the following birds present within this 2km radius are afforded protection under the Bird's Directive Little Egret *Egretta garzetta* (Annex I), Pheasant *Phasianus colchicus* (Annex II and Annex III), and Wood Pigeon *Columba palumbus* (Annex II and Annex III). A complete list of birds of conservation concern found within 5km of the site is found in Appendix D.

Amenity grass pitches have the potential to provide ex-situ foraging habitat for Brent Geese *Branta bernicla*, which have been known to forage within similar amenity pitches throughout the greater Dublin area, however, research by Handby & Bearhop (2022) tracking the usage of grass pitches by Brent Geese through GPS, has no evidence of them visiting .

The proposed site has been valued as being of **high local ecological importance** for breeding bird species of conservation concern, given the nesting availabilities and foraging opportunities for breeding birds within the site, while it is valued as being of **low local ecological importance** for wintering bird species giving that species, such as Black-headed Gull, may forage or nest within the site during the winter .

4.6.4 Amphibians

Surveyors did not record any direct or indirect evidence of amphibians during the ecological walk over. There are recent records observing amphibian species Common Frog *Rana temporaria* within 2km of the site, and there are no additional amphibians previously reported within a 5km radius of the site is found in the Appendix D.

The proposed site has been valued as being of **high local ecological importance** for amphibian species due to the stream adjacent to the site and the ditch present through the site, providing foraging and refuge resources available for amphibians.

4.6.5 Terrestrial Invertebrates

Surveyors recorded three invertebrate species utilising the site, including Holly Blue *Celastrina argiolus*, Honeybee *Apis mellifera* and Large White *Pieris brassicae* . While the JBA Ecologist did not document the presence of any protected terrestrial invertebrates within the site; the flower diversity, hedgerows and treelines within the site provide foraging opportunities for the terrestrial invertebrates on site.

The proposed site has been valued as being of **low local ecological importance** for terrestrial invertebrates on site, given the floral, tree and hedgerow resources present on site.

4.6.6 Aquatic Invertebrates - White-clawed Crayfish

While the watercourse adjacent to the site itself did not contain any White-clawed Crayfish, water from the stream flows northwards, along the south-west border of the site, before joining the main body of the River Camac. The River Camac supports a population of White-clawed Crayfish (AECOM, 2021), which is protected under the EU Habitats Directive Annex II and V, and also the Wildlife Acts.

The proposed site has been valued as being of **high local ecological importance** for White-clawed Crayfish due to its hydrological link with the River Camac.

4.6.7 Fish

While the watercourse adjacent to the site itself did not contain any Fish species, water from the stream flows northwards, along the south-west border of the site, before joining the main body of the River Camac. IFI records (IFI, 2022) indicate the presence of Brown trout *Salmo trutta*; Minnow *Phoxinus phoxinus* and Three-spined Stickleback *Gasterosteus aculeatus*.

The proposed site has been valued as being of **high local ecological importance** for Fish due to its hydrological link with the River Camac.

4.7 Invasive Non-native Species

No invasive non-native high impact species currently under the third schedule of the EC (Birds and Natural Habitats) Regulations 2011 S.I. No. 477/2011 species were recorded on-site during the ecological walkover. There is a list of previously reported species within a 5km radius of the site is found in Appendix D (NBDC, 2023).

4.8 Screening of Designated Sites & Ecological Features

The screening of designated sites and ecological features identified during the desktop study and ecological survey are given in Table 4-7. Sites and features screened out are not considered further in this assessment. Ecological features carried forward are assessed for potential impact during construction and operation in the following sections.

Table 4-7: Summary of ecological features and the screening assessment.

Designated site / Ecological feature	Value	Screening	Rationale
Rye water Valley/Carton [001398]	International	Screened out	(JBA, 2023 - AA Screening)
Glenasmole Valley [001209]	International	Screened out	(JBA, 2023 - AA Screening)
Wicklow Mountains [002122]	International	Screened out	(JBA, 2023 - AA Screening)
Wicklow Mountains [004040]	International	Screened out	(JBA, 2023 - AA Screening)
North Dublin Bay [000206]	International	Screened out	(JBA, 2023 - AA Screening)
South Dublin Bay [000210]	International	Screened out	(JBA, 2023 - AA Screening)
North Bull Island [004006]	International	Screened out	(JBA, 2023 - AA Screening)
South Dublin Bay and River Tolka Estuary [004024]	International	Screened out	(JBA, 2023 - AA Screening)
Slade Of Saggart And Crookling Glen pNHA	National	Screened out	(lack of hydrological connectivity/distance)
Grand Canal pNHA	National	Screened out	(lack of hydrological connectivity/distance)
Lugmore Glen pNHA	National	Screened out	(lack of hydrological connectivity/distance)
Kilteel Wood pNHA	National	Screened out	(lack of hydrological connectivity/distance)
Glenasmole Valley pNHA	National	Screened out	(lack of hydrological connectivity/distance)
Liffey Valley pNHA	National	Screened out	(lack of hydrological connectivity/distance)
Dodder Valley pNHA	National	Screened out	(lack of hydrological connectivity/distance)
Rye Water Valley / Carton pNHA	National	Screened out	(lack of hydrological connectivity/distance)

Designated site / Ecological feature	Value	Screening	Rationale
North Dublin Bay pNHA	National	Screened out	(lack of hydrological connectivity/distance)
South Dublin Bay pNHA	National	Screened out	(lack of hydrological connectivity/distance)
Dolphins, Dublin Bay pNHA	National	Screened out	(lack of hydrological connectivity/distance)
Buildings and artificial surfaces	Less than local	Screened out	Low floral diversity and foraging potential
Eroding/upland rivers	High Local	**Screened in**	**Local connection the River Camac**
Drainage Ditch	High Local	**Screened in**	**Refuge and spawning potential for local amphibians**
Amenity grassland (improved)	Less than local	Screened out	Low floral diversity and foraging potential
Dry meadows and grassy verges	High Local	**Screened in**	**Foraging commuting and nesting opportunities for mammals, birds and invertebrates**
Hedgerows	High Local	**Screened in**	**Foraging commuting and nesting opportunities for mammals, birds and invertebrates**
Treelines	High Local	**Screened in**	**Foraging commuting and nesting opportunities for mammals, birds and invertebrates**
Hedgerows / Treelines	High Local	**Screened in**	**Foraging commuting and nesting opportunities for mammals, birds and invertebrates**
Mammals - Red Squirrel, Badger, Hedgehog	High Local	**Screened in**	**Foraging and commuting opportunities within treelines and grasslands**
Bats - Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat, Long Bronw-eared Bat, Brandt/Whiskere'd Bat	High Local	**Screened in**	**Foraging and commuting opportunities within treelines and grasslands**
Breeding Birds	High Local	**Screened in**	**Foraging and commuting opportunities within treelines and grasslands**
Wintering Birds	Low Local	**Screened in**	**Foraging and nesting opportunities for wintering species**
Amphibians	High Local	**Screened out**	**Absence of foraging, spawning and commuting opportunities within site**
Terrestrial Invertebrates	Low Local	**Screened in**	**High floral resources in flower meadow on site**
Aquatic Invertebrates - Crayfish	High Local	**Screened in**	**Site connected to the River Camac which is a known location for Crayfish**
Fish	High Local	**Screened in**	**Site connected to the River Camac which is a known location for fish species**

Designated site / Ecological feature	Value	Screening	Rationale
Invasive Non-native Species	-	-	-

5 Other Relevant Plans and Projects

5.1 Cumulative Effects

As part of the Ecological Impact Assessment, in addition to the proposed works, other relevant projects and plans in the region that may induce cumulative effects must also be considered at this stage. The following projects or plans were identified as potential sources of cumulative effects:

5.2 Plans

- South Dublin County Development Plan 2022-2028
- Greater Dublin Drainage Strategy
- Third Cycle River Basin Management Plan for Ireland 2022-2027
- Planning Applications (retrieved from Data.gov.ie - Planning Application Sites, September 2023)

5.2.1 South Dublin County Development Plan 2022-2028

The proposed scheme's development is in line with the South Dublin County Development Plan 2022-2028. It is an objective of the Plan to ensure that all development within the County conforms to eight key design principles which includes the promotion of sustainable energy and environmental services. These goals include:

NPO 52 requires that the planning system will 'be responsive to our national environmental challenges and ensure that development occurs within environmental limits, having regard to the requirements of all relevant environmental legislation and the sustainable management of our natural capital.

The Plan also aims to protect and enhance surface water quality, to support, improve and protect Natura 2000 sites, and to develop an integrated Green Infrastructure network to enhance biodiversity, provide accessible parks, open spaces and recreational facilities (SDCC, 2022a). The plan also states that work will be in conjunction with Irish Water to protect existing water and drainage infrastructure, to promote investments aiming to support environmental protection and facilitate the sustainable growth of the county (SDCC, 2022a).

A Screening for Appropriate Assessment was carried out on the plan, which was concluded that an Appropriate Assessment was necessary for this project. The associated Natura Impact Report concluded that there are no likely significant direct, indirect, or secondary impacts of the project on any Natura 2000 sites (SDCC, 2022b), **therefore the SDCC Development Plan is not anticipated to contribute to cumulative or in-combination effects.**

5.2.2 Greater Dublin Drainage Strategy

The Greater Dublin Drainage Strategy sets out the strategic planning for the development of wastewater treatment in the Greater Dublin Area in relation to the Ringsend Wastewater Treatment Plant (WWTP) Upgrade, Greater Dublin Drainage Project and associated wastewater network drainage projects (Irish Water, 2018). The proposed developed connects with the Local Authority sewer system which is included in this strategy. The Ringsend WWTP Upgrade includes plans to expand the WWTP to its ultimate capacity, together with associated network upgrades required. The Greater Dublin Drainage Project is planned to relieve both the Ringsend WWTP and network loading by construction of a new WWTP at Clonshaugh, an orbital sewer and provision of an outfall pipe discharging 1km north-east of Ireland's Eye. The Ringsend WWTP upgrade is in progress and carried out in stages, with an increased capacity of 400,000 PE by the first half of 2021 and the ultimate capacity of 2.4 million PE to be in operation by 2025 (Irish Water, 2018). The Greater Dublin Drainage Project is strategically important to the Dublin Region in that it will provide capacity for residential and commercial growth (Irish Water, 2018).

Overall, the Greater Dublin Drainage Strategy is not considered to adversely effect any Natura 2000 site, nor is it expected to contribute to any cumulative or in-combination effects.

5.2.3 Third Cycle River Basin Management Plan for Ireland 2022-2027 (DoHPLG, 2022)

The first cycle of River Basin Management Plans included the Eastern River Basin District - River Basin Management Plan (ERBDMP) 2009 – 2015 (WFD (2010). The plans summarised the waterbodies that may not meet the environmental objectives of the WFD by 2015 and identified which pressures are contributing to the environmental objectives not being achieved. The plans described the classification results and identified measures that can be introduced in order to safeguard waters and meet the environmental objectives of the WFD.

- Prevent deterioration of water body status.
- Restore good status to water bodies.
- Achieve protected areas objectives.
- Reduce chemical pollution of water bodies

The 2nd cycle River Basin Management Plan (RBMP) for Ireland 2018-2021 sets out the actions that Ireland will take to improve water quality and achieve 'good' ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2021 (DoHPLG, 2018a). Changes from previous River Basin Management Plans is that all River Basin Districts are merged as one national River Basin District. The Plan provides a more coordinated framework for improving the quality of our waters — to protect public health, the environment, water amenities and to sustain water-intensive industries, including agri-food and tourism, particularly in rural Ireland.

The 3rd and current cycle aims to build on the initiatives of the second cycle, particularly the governance and implementation structures, and to improve the establishment of Irish Water, An Forum Uisce, the Local Authority Waters Programme and the Agricultural Sustainability Support and Advisory Programme.

The third cycle draft Catchment Report for Liffey and Dublin Bay Catchment (EPA, 2021) identified that between Cycles 2 and 3 there has been an overall small improvement in the catchment's status. The overall change in quality between Cycles 2 and 3 include 2 waterbodies that have achieved High Status, which is an increase of one, 56 which achieve Good Status has been increased by four, 23 achieving a Moderate Status which is a decrease in four waterbodies, and 24 achieving a Poor Status an increase of 1 between cycles. There are no Bad Status waterbodies as of Cycle 3, which is a decrease of one from Cycle 2. The main significant pressures are aquaculture, anthropogenic, atmospheric, historically polluted sites and waste pressures followed by agriculture, urban run-off and forestry.

The Third Cycle River Basin Management Plan for Ireland 2022-2027 is not anticipated to contribute to cumulative or in-combination effects.

5.3 Other Projects

Other projects dating back three years are listed in Table 5-1 (overleaf), which are not retention applications, home extensions and/or internal alterations, and have been granted planning permission in the locality of the proposed site.

Table 5-1: Other projects within approximately 2km which may have an accumulative effect on the development of the project

Planning Reference	Address	Application Status	Decision date	Summary of development
SD22A/0422	Citywest Shopping Centre, Fortunestown, Dublin 24	Permission Granted	11/01/2023	Amendments to the residential development permitted under An Bord Pleanála Reference ABP-305556-19 comprising of the omission of a permitted vehicular access ramp from ground to basement level of the existing Citywest Shopping Centre along the southern elevation; The permitted entrance to the ramp is proposed to be replaced at surface level with 5 car parking spaces, with associated amendments to the parking layout, pedestrian paths and landscaping in the immediate vicinity; An increase in the area of a permitted surface to basement level circulation core in the south-eastern corner of the existing Citywest Shopping Centre (to incorporate a lift and revised stairwell design), together with associated amendments to pedestrian paths and landscaping in the immediate vicinity; The relocation of permitted demountable bollards further eastwards along a permitted roadway to the south-east of the Citywest Shopping Centre; The enlargement of a permitted hammerhead circulation area to the south-east of the Citywest Shopping Centre and the provision of a standalone ESB Substation to the south-east of Block D; These amendments are provided to reprove the operational efficiency of the vehicle circulation and parking arrangement to service the permitted apartment buildings and to meet the requirements of ESB to serve the site.
SHD3ABP-310570-21	Site at Cooldown Commons & Fortunestown, Citywest, Dublin 24	Permission Granted	6/10/2021	Construction of a residential scheme comprising 421 units, offices, retail units x3 and residential amenity areas x2, within 9 blocks ranging in height from 1-13 storeys. The proposal will include 289 car parking spaces along with 650 cycle parking spaces. The development will provide public and communal open spaces throughout including a public plaza adjoining Fortunestown Luas stop. Provision of vehicular, pedestrian, and cyclist accesses to the site, including pedestrian bridge to the public park (under construction) to the east. The application includes for all landscaping, ESB substations, plant areas, bin storage, surface water attenuation and all other site development works, and site services required to facilitate the proposed development. The proposed development seeks to amend SHD permission ABP-302398 -18 (under construction to the west), replacing 32 permitted duplex apartments along with associated amendments to internal roads and open spaces. The current proposal also replaces permission SD16A/0078 previously granted on this site.
SD22A/0065	Magna Avenue and Magna Drive, Citywest, Dublin 24	Permission Granted	11/07/2022	Provision of a warehouse unit with ancillary office and staff facilities and associated development. The building will have a maximum height of 15.5m with a gross floor area of 13,604sq.m including a warehouse area (12,568sq.m), staff facilities (489sq.m) and ancillary office area (538sq.m). The development will also include a vehicular and pedestrian entrance to the site from Magna Avenue, a separate HGV entrance from Magna Drive; 69 ancillary car parking spaces; covered bicycle parking; HGV parking and yards'; level access good doors; dock levellers; access gates; signage; hard and soft landscaping; lighting boundary treatments; ESB substation; sprinkler tank and pump house; an all associated site development works above and below ground.

Planning Reference	Address	Application Status	Decision date	Summary of development
SD19A/0393	Fortunestown Lane, Saggart, Co. Dublin	Permission Granted	7/10/2020	New educational campus of 2 new school buildings to be delivered on a phased basis including the demolition/removal of the existing 4 four storey educational/former short stay residential blocks (golf apartments) on the site; provision of 1 part three storey, 1000 pupil post primary school including 4 classroom special educational needs unit with a gross floor area of 11,331sq.m including a sports hall and all ancillary teacher and pupil facilities; 1 two storey 16 classroom primary school and 2 classroom special educational needs unit; a general purpose hall and all ancillary teacher and pupils facilities with a gross floor area of 2,820sq.m; vehicular access to the site will be from the existing Fortunestown Lane entrance, which is to be widened; fire tender and delivery access will be from the existing entrance to the northwest of the site, via Fortunestown Lane; cycle and pedestrian access to the site will be from a new entrance on Fortunestown Lane; provision of bicycle and scooter parking; new pedestrian crossing at Saggart Lakes Road, vehicle drop off/set down areas; internal access roads; hard and soft play areas; piped infrastructure and ducting; plant, landscaping and boundary treatments; PV panels; external courtyards; disabled car parking spaces; ESB substation and 1 substation access door to the site boundary wall on Fortunestown Lane; ancillary ramps and stairs; signage; 1 attenuation tank; flood mitigation measures; SUD's; changes in level and all associated site development and excavation works above and below ground.
SHD3ABP-300555-18-EP	Site bounded by Fortunestown Lane, Garters Lane and Bianconi Avenue, Saggart, Co. Dublin	Granted Extension for Duration of Permission	10/11/2022	A residential development comprising: 526 residential units and all associated site and development works as follows: - 274 3-bed 2 storey terraced units, 185 4-bed 2 and 3 storey terraced and end of terrace units, 67 2-bed apartment/duplex units (37 2-storey, 2 bed terraced duplexes, 18 1-storey 2 bed terraced apartments and 12 1 storey 2 bed end of terrace apartments). The development also provides for a district park (4.58 ha) and a neighbourhood park (0.71 ha) in accordance with the Fortunestown Local Area Plan 2012. Permission is also sought for 789 car parking spaces, bin storage areas, ESB substations and all associated site development and infrastructural works. Vehicular access to serve the proposed development will be provided via two new access points off Garter Lane and via a new signalised junction at the southeastern corner of the site to replace the existing roundabout off Fortunestown Lane. Provision is made for a future access to Bianconi Avenue. In addition, an interim local square is proposed within the subject site providing a direct pedestrian link from the proposed development to the Saggart Luas stop. Two direct pedestrian links are proposed between the subject site and the adjoining school sites permitted under Reg Ref No SD16A/0255 providing a direct link between the school and the proposed district park and a direct link from the west of the school site to the proposed residential development. Lands identified for future development are located along the southern boundary of the current application site adjacent to Fortunestown Lane/Saggart Luas Stop. These areas will be subject of a future planning application (Phase 2) and will include the final design and layout of the local square.
SD20A/0232	The Former	Permission Granted	24/05/2021	Demolition of existing Public House building and of existing incomplete buildings on the east

Planning Reference	Address	Application Status	Decision date	Summary of development
	Embankment Site at Saggart Road & Blessington Road, Co. Dublin			side of the site; construction of a three storey hotel comprising of 129 bedrooms, reception and ancillary bar (136sq.m) at ground floor, restaurant (311sq.m) in single storey building; associated waste storage to the west of the site; 3 three storey Aparthotel buildings comprising 15 units each (45 units in total) comprising of studios, one bed, two bed and three bed units to the south and south east; 3 small balconies with small terraces under on the north façade of the Aparthotel Block A & B and the west façade of Block C; new vehicular and pedestrian entrance at Boherboy/Saggart Road (L2008); new footpath along the Boherboy/Saggart Road (L2008); parking area for 120 cars and 30 bicycles; extensive tree planting throughout; substation together with all associated site works, boundary treatments and landscaping; total floor area of buildings is 8,313sq.m; existing vehicular entrance to the site on the Blessington Road will remain for emergency use only; An Ecological Impact Assessment is submitted as part of this application.

5.4 Summary

The developments permitted above have the potential to have overlapping construction and short-term residual impact phases with the proposed development and therefore, in the absence of mitigation measures, these developments may result in potential in-combination or cumulative impacts given their proximity to the local Natura 2000 sites.

The County and Local Development Plan; RBMP and projects within the locality of the proposed project are considered in combination with the currently proposed project in the Cumulative Impact section below.

6 Impact Assessment

6.1 Introduction

The impacts on the valued ecological features are assessed here. The initial assessment considers the potential impact pathways and whether these apply to the ecological features. The impact assessment considers the project and the anticipated effects in the absence of any mitigation.

The potential impacts from the enhancement works are assessed under the following:

- Disturbance to habitats and species
- Habitat loss (foraging, commuting, general refuge and nesting)
- Impacts on water quality.

The following sections describe the nature of immediate / short-term impacts, as well as any medium- or long-term impacts, predicted for, habitats and species in the absence of implemented mitigation measures during the maintenance works.

6.2 Do Nothing Scenario

If the proposed works were not to go ahead and the present land management continues as is, the ecological value of the site would remain unchanged.

6.3 Construction Phase

6.3.1 Habitats

Eroding/upland rivers and Drainage Ditch

While not directly involved within the scope of works, the ditch is integrated with the hedgerows that are to be enhanced, while the Corbally Stream is located along the western site boundary. Given these aquatic habitats' proximity to the works they will be vulnerable to surface water (run-off) polluting events. (e.g., leaking or spilled hydrocarbons) which may occur within the site, and these pollutants will be transferred to any riverine connections downstream.

Therefore, in the absence of mitigation, during the construction phase, **a temporary negative impact of slight significance** is anticipated for these habitats.

Dry meadows and grassy verges

While the project involves the alteration of sections of the site for social purposes including pathways, play and exercise areas, the grassy verges throughout the site are anticipated to be retained as "Rewilding areas".

Due to the verges' proximity to the areas of work, they will still be vulnerable to surface water (run-off) polluting events. (e.g., leaking or spilled hydrocarbons) which may occur within the site. This impact would have a knock-on effect on the protected faunal groups which frequent this habitat for commuting, foraging or refuge purposes.

Therefore, in the absence of mitigation, during the construction phase, **a temporary negative impact of slight significance** is anticipated for these habitats.

Treelines, Hedgerows and Treelines/Hedgerow

The treelines on site will be enhanced and involved in the creation of a tree trail, including planting of 3 native trees (Alder, Willow, and Hawthorn) and the retention of the already existing species. The project also involves the planting of a number of trees across the site, including a mini woodland, however the species have not yet been determined. The species will be native Irish species and Pedunculate Oak, Lime, Scots Pine, as well as non-native Himalayan Birch *Betula utilis*. A row of pleached limes will be planted along the basketball court. There has been a proposed Mini Woodland located in the west of the site. Hedgerow on site will be retained and improved in parts.

Due to these habitats' inclusion in the final project landscape plans, they are not anticipated to be physically disturbed or degraded, i.e., damaging of limbs or physical root compaction from machinery during the construction phase of the development, however they may still be accidentally damaged

during the enhancement works within the site, and will still be vulnerable to surface water (run-off) polluting events. (e.g., leaking or spilled hydrocarbons) which may occur within the site. This impact would have a knock-on effect on the protected faunal groups which frequent these habitats for commuting, foraging or refuge purposes.

Therefore, in the absence of mitigation, during the construction phase, **a temporary negative impact of slight significance** is anticipated for these habitats.

6.3.2 Species

Ground-Dwelling Mammals - Badger, Hedgehog and Red Squirrel

While there were no signs of Badger, Hedgehog and Red Squirrel during the ecological walkover, this does not ensure that the local mammal species do not occasionally visit the site area for foraging. Bearing this in mind, minor impacts may arise in the form of disturbance to foraging and commuting activities, as well as potential loss of life to individuals in the case of the accidents within the construction site (e.g. accidental trappings), after failure to exclude entry.

Therefore, in the absence of mitigation, during the construction phase, **a temporary negative impact of slight significance** is anticipated for these mammal species.

Bats - Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat, Brown Long-ear Bat, Brandt's Bat and/or Whiskered Bat

Impacts during construction relate to construction-based external lighting and accidental damage to hedgerows and treelines during enhancement works which could reduce the quality of foraging and commuting within the habitats on-site for bats.

Therefore, in the absence of appropriate mitigation for lighting during the construction phase, there is likely to be **a temporary negative impact of slight significance** for local bats.

Breeding Birds

Local breeding bird species will potentially be physically disturbed from their foraging activities during the construction works. Additionally, during the period of enhancement works on the habitats on site, there will be a reduction of potential foraging resources within the site. This reduction of prey base could further impact the foraging capabilities of breeding birds on the site.

Therefore, in the absence of mitigation during the construction phase**, a temporary negative impact of slight significance** is anticipated for these bird species.

Wintering Birds

Local wintering bird species will potentially be physically disturbed from their foraging opportunities during the construction works. While there are a number of bird species in the general area of conservation concern, the extent of the works on the site are small, contained and temporary,and will overall not impact the foraging potential for on-site wintering birds.

Therefore, in the absence of mitigation during the construction phase, a **short-term negative impact of slight significance** is anticipated for wintering bird species due to minor disturbance of foraging activities from habitat damage.

Terrestrial Invertebrates

Local terrestrial invertebrates will face minor impacts that may arise in the form of disturbance to foraging and commuting activities.

Therefore, in the absence of mitigation, during the construction phase, **a temporary negative impact of slight significance** is anticipated for local terrestrial invertebrates.

Crayfish and Fish

As White-clawed Crayfish and various Fish species are known to inhabit the River Camac to the north, which is connected hydrologically to the site, pollution events on-site have the potential to degrade their aquatic environment. Bearing the distance between the site and the location of Crayfish and Fish species in mind, they will still be vulnerable to surface water (run-off) polluting events. (e.g., silt laden

water or leaking or spilled hydrocarbons) which may occur within the site and disperse into the River Camac.

Therefore, in the absence of mitigation during the construction phase**, a temporary negative impact of slight significance** is anticipated for Crayfish and Fish.

6.4 Operation Phase

6.4.1 Habitats

Eroding/upland rivers and Drainage Ditches

The operational phase is not anticipated to have any impact on the Corbally Stream and the site's existing drainage ditches, while the inclusion of SuDS wetlands within areas of the park will enhance the biodiversity of aquatic habitats within the site.

Therefore, the inclusion of wetlands within the site will have an overall long-term, **positive impact of slight significance** on these aquatic habitats.

Dry Meadow and grassy verges

The grassy verges along the boundaries of the site, and to the south near the treeline and hedgerow areas are to be designated as "Rewilding areas".

Therefore, the operational phase is anticipated to have a **long-term positive impact of slight significance** on the grassy verges, given the natural succession of species within these areas.

Treelines, Hedgerows and Treeline / Hedgerow Mosaic

Positive impacts on these habitat types during the operational phase are anticipated in the form of enhancements of the existing treelines and meadows, along with the introduction of new treelines along the pathways. The increased health and spread of hedges and treelines will increase the foraging opportunities within the site for local mammals, birds and invertebrates, while also increase the nesting opportunities for breeding birds, and foraging for bats.

Additionally, a section of the west of the site is proposed to be converted into a woodland habitat, which will enhance the biodiversity of the area through additional planting and resource availability.

Therefore, the increase in the total area and health of these habitat types are anticipated to have **long-term, positive impact of slight significance,** given the improvement, extensions and planting related to these habitats.

6.4.2 Species

Mammals

The diversification of habitat types and the enhancement of existing habitats, including increased hedgerow health, increased tree planting and the additional of the mini woodland, will have knock-on benefits, i.e., increased foraging opportunities and refuge, for local ground dwelling mammals.

Therefore, diversification of habitat types and the enhancement of existing habitats is anticipated to have a **long-term, positive impact of slight significance** for local mammals.

Bats

The diversification of habitat types and the enhancement of existing habitats, including increased hedgerow health, increased tree planting and the additional of the mini woodland, will have knock-on benefits, i.e., increased foraging opportunities and refuge, for local bat species.

Therefore, diversification of habitat types and the enhancement of existing habitats is anticipated to have a **long-term, positive impact of slight significance** for local mammals.

Amphibians

Given the nature and extent of the project's operations, negative impacts for these species are not anticipated during the operational phase, while the increased wetlands within the site is anticipated to

have a **long-term, positive impact of slight significance** on amphibian species given the increase in spawning and foraging potential associated with these wetlands.

Breeding Birds & Wintering Birds

The diversification of habitat types and the enhancement of existing habitats, including increased hedgerow health, floral diversity, tree planting and creation of the mini woodland and wetlands, will have knock-on benefits, i.e., increased nesting (breeding only) and foraging opportunities, and refuge for local breeding bird species.

Therefore, the operational phase is anticipated to have a **long-term, positive impact of slight significance** on breeding and wintering bird species.

Terrestrial Invertebrates

The diversification of habitat types and the enhancement of existing habitats, including increased hedgerow health, floral diversity, tree planting and creation of the mini woodland and wetlands, will have knock-on benefits, i.e., increased hive-creation and foraging opportunities, and refuge, for local invertebrate species.

Therefore, diversification of habitat types and the enhancement of existing habitats is anticipated to have a **long-term, positive impact of slight significance** for local terrestrial invertebrates.

Crayfish & Fish

Given the nature and extent of the project's operations, adverse impacts for this species are not anticipated during the operational phase.

6.5 Summary

The following potential significant impacts during the construction phase have been identified below, while the necessary mitigation is discussed in the next chapter:

- Pollution of aquatic habitats and protected species that inhabit them or those that inhabit aquatic habitats downstream (i.e., Amphibians, Crayfish and Fish).
- Disturbance of commuting and foraging ground-dwelling mammals, birds and bats, as well as potentially accidental fatal entrapment for these species.
- Disturbance of commuting, foraging, and nesting for local breeding birds of conservation concern.

The mitigation is based on existing guidance documentation and where necessary additional mitigation is proposed to reduce the impacts identified above.

7 Mitigation

The following mitigation is recommended to ensure that the proposed works do not adversely impact on the ecological receptors outlined in Section 6.

Mitigation measures for anticipated impacts on designated sites and ecological features are outlined below.

7.1 Project Construction Phase

The activities of the project for the construction phase shall remain within the boundary of the proposed site. Within this area, the mitigation measures outlined below shall be implemented.

- A Construction and Environment Management Plan (CEMP) will be submitted to South Dublin County Council for agreement prior to site works commencing. This CEMP will incorporate the mitigation measures listed here.
- The CEMP will also strictly adhere to best practice environmental guidance including but not limited to the following:
- - CIRIA Guidance C532 Control of water pollution from construction sites. Guidance for consultants and contractors. (CIRIA, 2019 - www.ciria.org);
- - CIRIA Guidance C741: *Environmental good practice on site guide* (Charles & Edwards, 2015; CIRIA, 2019 - www.ciria.org);
- - CIRIA Guidance C750D: *Groundwater control: design and practice* (Preene *et al.*, 2016; CIRIA, 2019 - www.ciria.org);
- Construction method statements will be submitted to South Dublin County Council for agreement prior to site works commencing.

7.1.1 Site Compound

- The works compound will be sited within the car park in the eastern section of the site away from the higher-valued dry meadow habitats, treelines and hedgerows and stream, which are located throughout the development site.
- Only plant and materials necessary for the construction of the works will be permitted to be stored at the compound location.
- Site establishment by the Contractor will include the following:
- - Site facilities (e.g., toilets);
- - Secure compound for the storage of all on-site machinery and materials;
- - Temporary car parking facilities;
- - Temporary fencing;
- Site Security to restrict unauthorized entry;
- Bunded storage of fuels and refuelling area. All tank and drum storage areas on the site will, as a minimum, be bunded to a volume not less than the following;
- - 110% of the capacity of the largest tank or drum within the bunded area, or
- - 25% of the total volume of substances which could be stored within the bunded area.
- Spill kits will be stored in the site compound with easy access for delivery to site in the case of an emergency. Spill kits must include suitable spill control materials to deal with the type of spillage that may occur and where it may occur. Typical contents of an on-site spill kit will include the following as a minimum:
- - Absorbent granules;
- - Absorbent mats/cushions;
- - Absorbent booms;
- - Track-mats, geotextile material and drain covers
- All used spill materials e.g., Absorbent pads will be placed in a separate container which will be located in the Contractors compound to store absorbents used to contain spillages of

hazardous materials. The container will be clearly labelled, and the contents of the container will be disposed of by a licenced waste contractor at a licenced site.

- All used spill materials will be placed separate container which will be located in the Contractors compound to store absorbents used to contain spillages of hazardous materials. The container will be clearly labelled, and the contents of the container will be disposed of by a licenced waste contractor at a licenced site. Records will be maintained of material taken off site for disposal.
- A maintenance programme for the bunded areas will be managed by the site environmental manager. The removal of rainwater from the bunded areas will be their responsibility. Records will be maintained of materials taken off site for disposal.
- The site environmental manger will be responsible for maintaining all training records.
- Potentially contaminated run off from plant and machinery maintenance areas will be managed within the site compound surface water collection system.
- Wherever reasonably practical, refuelling of vehicles will be carried out off site at designated refuelling areas to reduce risk of accidental hydrocarbon pollution events. These areas will be rendered impervious and will be constructed to ensure no discharges will cause pollution to surface or ground waters.

7.1.2 Water Quality

Relevant legislation and best practice guidance that have been considered includes but not limited to the following:

- Water Framework Directive (2000/60/EC);
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009;
- Local Government (Water Pollution) Acts 1977-1990;
- CIRIA C532 *Control of water pollution from construction sites*. Guidance for consultants and contractors. (www.ciria.org);
- CIRIA Guidance C750D: *Groundwater control: design and practice* (Preene *et al.*, 2016) (www.ciria.org);
- CIRIA C515 Groundwater control – design and practice, 2nd ed. (CIRIA, 2021 - www.ciria.org)
- CIRIA Guidance C741: *Environmental good practice on site guide* (Charles & Edwards, 2015; CIRIA, 2020 - www.ciria.org)

To prevent watercourse pollution:

- Adoption of a surface water plan including appropriate barrier controls to prevent any polluted surface water from the site reaching the adjacent habitats of high local ecological value.
- Minimise area of exposed ground by maintaining existing vegetation in vicinity of site compound.
- Fail-safe site drainage and bunding through drip trays on plant and machinery will be provided to prevent discharge of chemical spillage from the sites to surface water.

7.1.3 Dust generation management

The following measures will be implemented to prevent the generation and spread of dust from the site to nearby areas:

- Stockpiles of soil to be located away from aquatic habitats
- Limit the breaking of the topsoil or earth stripping from occurring during dry and windy weather.
- Wheel washing of vehicles leaving the site, covering of fine dry loads or spraying of loads prior to exiting the site, and if necessary regular cleaning of public roads in the vicinity of the entrance.
- Appropriate maintenance of vehicles and machinery to minimise any extensive release of exhaust pollutants during works (OPR, 2004).

7.1.4 Concrete Management Procedures

The following measures will be implemented to prevent liquid concrete/ cement-based dust entering the adjacent habitats of ecological value.

- Wherever reasonably possible, pre-cast concrete features should be utilised to minimise the risk of a concrete-based pollution event.
- Concrete delivery, concrete pours and related construction methodologies will be part of the procedure agreed with the contractor to mitigate any possibility of spillage or contamination of the local environment. Particular attention will be paid during the pouring process in order to avoid leakages or spills of concrete.
- Washout of concrete plant will occur off site at a designated impermeable area with waste control facilities.
- Raw, uncured or waste concrete will be stored appropriately prior to disposal by licenced contractor.
- The contractor's construction methodology will require the use of precast elements where practical; the use of secondary protection shuttering for concrete pours; all pours to be carried out in dry weather conditions; and that all trucks be cleaned prior to leaving respective depots.
- The contractor will be required to use experienced operators for the work; provide an appropriate level of continuous monitoring during any concrete pours by experienced management; and have method statements approved by the client prior to commencing works. Works will be carried out using recommendations from current guidance and relevant codes of practise as outlined in **EA (2011) -** *Managing concrete wash waters on construction sites: good practice and temporary discharges to ground or to surface waters*.

7.1.5 Pollution Control and Spill Prevention

A minimum stock of spill kits will be maintained at all times and site foremen's vehicles will carry large spill kits at all times. Absorbent material will be used with pumps and generators at all times and used material disposed of in accordance with the Waste Management Plan.

Regular inspections and maintenance of plant and machinery checking for leaks, damage or vandalism will be made on all plant and equipment.

In the event of a spill the Contractor will ensure that the following procedure are in place:

- Emergency response awareness training for all Project personnel on-site works.
- Appropriate and sufficient spill control materials will be installed at strategic locations within the site.
- All potentially polluting substances such as oils and chemicals used during construction will be stored in containers clearly labelled and stored with suitable precautionary measures such as bunding within the site compound.
- Oil soakage pads should be maintained on-site to enable a rapid and effective response to any accidental spillage or discharge. These shall be disposed of correctly and records will be maintained by the environmental manager of the used booms and pads taken off site for disposal.
- Damaged or leaking containers will be removed from use and replaced immediately.

7.1.6 General Avoidance Measures

Although it has been identified that there will be no permanent impact through disturbance to wildlife during the work, it is advised that general avoidance measures be undertaken to protect wildlife while the works are being carried out.

General avoidance measures that should be incorporated by the contractors working on site include:

- Limit the hours of working to daylight hours, to limit disturbance to nocturnal and crepuscular animals;
- Due to the potential presence of; Red Squirrel, Hedgehog, Badger and the confirmed presence of bats, the use of lighting at night should be avoided. If the use of lighting is essential, then a directional cowl should be fitted to all lights to prevent light spill and to be directed away from all treelines / wooded areas.

- Contractors must ensure that no harm comes to wildlife by maintaining the site efficiently and clearing away materials which are not in use, such as wire or bags in which animals can become entangled; and
- Any pipes should be capped when not in use (especially at night) to prevent local fauna becoming trapped. Any excavations should be covered overnight to prevent animals from falling and getting trapped. If that is not possible, a strategically placed plank should be placed to allow animals to escape.

7.1.7 Site Lighting Design

Hours of illumination during works and operational phases:

Any the lighting that is to be utilised during the construction phase will be controlled by photocells which go on/off at sunrise and sunset as per set lux levels. Additionally, Virtual Midnight dimming will also be incorporate on-site, which automatically dims the lights by 33% between midnight and 6am.

Light levels and type:

Construction site lighting that meets the lowest light levels permitted under health and safety would be preferable for bats in the vicinity. The specification and colour of light treatments, such as single bandwidth lights and no UV light are essential. LED luminaires are ideal and should be used where possible due to their sharp cut-off, lower intensity, and dimming capability. A warm white spectrum (3000K) should be used in the lighting located along the boundaries of the site to reduce the blue light component.

Column heights of lamp posts:

As bats most likely forage in the unlit areas within and around the site, the introduction of new lighting as a result of the new development, with accompanying light spillage, is anticipated to result in the bats becoming averse to commuting and foraging within the proposed site and potentially the adjacent habitats also. In order to reduce the amount of light spillage where it is not needed, the height of lamp columns should be restricted. A height of 6m or less is necessary to avert lighting impacts.

7.1.8 Root compaction and limb damage avoidance

In order to avoid the damage and compaction of roots and vegetation, storage and movement of machinery should be avoided in rooting zones adjacent to the trees, and fences should be in place in the areas of the of trees and hedges that are not scheduled for maintenance works.

7.2 Biodiversity Enhancement features for the Operational Phase

7.2.1 Remedial Tree and Hedge Planting

The proposed remedial tree and hedge planting will help enhance floral diversity within the site. The tree and hedge blossoms will improve the area for terrestrial invertebrates, while the fruits will be consumed by mammals and birds. Additionally, the trees once mature will provided ample nesting opportunities for local bird species. Furthermore, the increased invertebrate presence as a result of the new trees will provide additional prey items for insectivorous bird species, as well as the local bat populations.

7.2.2 Sowing of Wildflower Meadow

The proposed landscape plan for the development includes the sowing of wildflower meadows within the green areas of the development. These new wildflower meadows will contribute to the functionality provided by the current dry meadow habitat.

7.2.3 Bat Boxes

In the interest of enhancing the site for the local bats (i.e., the Pipistrelles and Leisler's Bat that display high site fidelity) JBA recommends that a minimum of two bat boxes should be installed on-site. If possible, these bat boxes should be south-facing and at least 4m off the ground. If erecting on a mature tree, the placement must be free from ivy with no branches within a 1m radius around the location of the box.

Within the Irish context, it is recommended that bat boxes be installed in dark areas around the park. Example of suitable bat boxes include the 1FF Schwegler Bat Box with Built-in Wooden Rear Panel and the 2F Schwegler Bat Box (General Purpose).

Guidance on installing bat boxes can be found here: https://www.bats.org.uk/our-work/buildingsplanning-and-development/bat-boxes/putting-up-your-box.

Simple bat boxes suitable for Pipistrelle's and Leisler's bats can be bought online or constructed by local community groups e.g., Men's Sheds. Note that some bat box designs (that are enclosed at the base) require annual cleaning out, which must be carried out by a Bat Specialist or NPWS Ranger.

Guidance on installing bat boxes is detailed in the following resource document: http://www.batcon.org/images/InstallingYourBatHouse_Building.pdf .

- A summary on installing bat boxes can be summarised as:
    - Suggested locations include areas with mature trees within treelines.
    - All bat boxes should be mounted at least 3-4 metres above the ground.
    - Mount on the south facing side of the tree where the box exposed to the sun for part of the day.
    - Do no install bat boxes on a tree that is near any lighting column.

These suggestions are generalised for the improvement of a site to become more bat friendly. As such, it is recommended that if there are intended to be bat enhancements on site, that a bat specialist provides more definitive advice on how and where to appropriately facilitate bat boxes.

8 Residual Impact

Residual ecological impacts are those that remain once the development proposals have been implemented. The main aim of ecological mitigation, compensation and enhancement is to minimise or eliminate residual impacts.

8.1 Construction Phase

Preparatory and construction works will result in disturbance to the foraging and commuting habitat for protected species such as ground-dwelling mammals, bats, birds, amphibians and invertebrates.

Implementation of mitigation measures during the construction works phase, along with good site management and construction practices will help to minimise any significant and/or permanent impact on the environment. This will be included in a Construction Environmental Management Plan (CEMP). Included in this will be best practice measures for visual and audible disturbance, as well as control of surface and ground water pollution, which will minimise any impact on local habitats and the species reliant on them.

With the proposed mitigation implemented the residual impact during the construction phase is assessed to be of temporary negative impact on account of the disturbance to habitats of high local ecological importance, as well as the local protected species.

8.2 Operational Phase

The proposed remedial planting within the development, i.e., tree and hedge planting, and the addition of the on-site wetlands; will help maintain the overall floral and faunal biodiversity of the site. Overall, the works will have a positive residual impact on the biodiversity within and adjacent to the site.

9 Summary of Impact Assessment

9.1 EcIA Table

Table 9-1 presents a summary of the impacts envisaged when mitigation approaches are included. Residual impacts are also described.

All other ecological impacts can be avoided, mitigated or compensated so there is no anticipated significant impact for the habitats and species considered in the assessment.

Table 9-1: Summary of Impacts; Mitigations; and Significance of Residual Impacts on ecological features

Ecological Features	Impacts	Importance of Feature	Significance of impact without Mitigation	Mitigation	Significance of Residual Impacts
Eroding/upland river Drainage ditch	Accidental introduction of pollutants into the habitat, degrading its condition and its ability to support the protected species associated with the habitat on site and downstream.	High Local	Slight, temporary negative impacts during the construction phase.	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 ensuring the protection of local aquatic habitats from dust, concrete and pollutant spill.	Neutral residual impact during the operational phase
Dry Meadow and grassy verges	Accidental introduction of pollutants into the habitat, degrading its condition and its ability to support the protected species associated with the habitat.	High Local	Slight, temporary negative impacts during the construction phase.	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 ensuring the protection of grassland habitats from dust, concrete and pollutant spill.	Long-term positive residual impact during the operational phase due to increased maintenance and planting
Hedgerows Treelines Hedgerow/ Treeline	Accidental introduction of pollutants into the habitat, degrading its condition and its ability to support the protected species associated with the habitat. Loss of habitat through accidental damage from machinery	High Local	Slight, temporary negative impacts during the construction phase.	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 ensuring the protection of local tree and hedgerow habitats from dust, concrete and pollutant spill. - The mitigations outlined in Sub-section 7.1.8 ensuring the safeguarding of trees and hedges from root compaction and limb damage.	Long-term positive residual impact during the operational phase due to increased maintenance and planting
Mammals - Red Squirrel, Badger, Hedgehog	Accidental introduction of pollutants into the habitats utilised by local mammal	High Local	Temporary negative impact of slight significance	Strict adherence to: - The mitigations outlined in Sub-sections	Long-term slight, positive residual impact during

Ecological Features	Impacts	Importance of Feature	Significance of impact without Mitigation	Mitigation	Significance of Residual Impacts
	populations, reducing their ability to provide refuge, safe commuting routes and foraging opportunities. Physical, visual and audible disturbance from construction works. Accidental entrapment and/or injuries caused by on-site machinery or supplies.			7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 ensuring the protection of local habitats which are used by local mammal species. - The mitigations listed in Sub-sections 7.1.6 in relation to the prevention of disturbance and/or entrapment of local mammals.	the operational phase due to the expansion of the woodland and hedgerow habitats
Bats - Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat, Brown Long-eared Bat Brandt's Bat/Whiskered Bat	Accidental introduction of pollutants into the habitats utilised by local bat populations, reducing their ability to provide refuge, safe commuting routes and foraging opportunities. Physical, visual and audible disturbance from construction works.	High Local	Temporary negative impact of slight significance	Strict adherence to: The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 ensuring the protection of local habitats which are used by local Bat species. The mitigations listed in Sub-sections 7.1.6 and 7.1.7 in relation to the general avoidance and lighting impact safeguards for local bat species. - The mitigations outlined in Sub-section 7.1.8 ensuring the safeguarding of trees and hedges from root compaction and limb damage which will ensure continuous foraging and commuting.	Long-term slight, positive residual impact during the operational phase due to the expansion of the woodland and hedgerow habitats
Breeding Birds	Accidental introduction of	High Local	Temporary negative	Strict adherence to:	Long-term slight,

Ecological Features	Impacts	Importance of Feature	Significance of impact without Mitigation	Mitigation	Significance of Residual Impacts
Wintering Birds	pollutants into the habitats utilised by local bird populations, reducing their ability to provide refuge, safe commuting routes and foraging opportunities. Physical, visual and audible disturbance from construction works. Accidental entrapment and/or injuries caused by on-site machinery or supplies.	Low Local	impact of slight significance	- The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 ensuring the protection of local habitats which are used by local bird species. - The mitigations listed in Sub-sections 7.1.6 in relation to the prevention of disturbance and/or entrapment of local bird species.	positive residual impact during the operational phase due to the expansion of the woodland and hedgerow habitats
Amphibians	Accidental introduction of pollutants into the habitats utilised by local amphibian populations, reducing their ability to provide refuge, safe commuting routes and foraging opportunities. Accidental entrapment and/or injuries caused by on-site machinery or supplies.	High Local	Temporary negative impact of slight significance	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 ensuring the protection of local habitats which are used by local amphibian species. - The mitigations listed in Sub-sections 7.1.6 in relation to the prevention of disturbance and/or entrapment of local amphibian species.	Long-term slight, positive, residual impact during the operational phase due to addition of wetlands to the site
Terrestrial Invertebrates	Accidental introduction of pollutants into the habitats utilised by terrestrial invertebrates, reducing their foraging opportunities.	Low Local	Temporary negative impact of slight significance	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 ensuring the protection of local habitats which are used by local invertebrates species.	Long-term slight, positive residual impact during the operational phase due to the expansion of the

Ecological Features	Impacts	Importance of Feature	Significance of impact without Mitigation	Mitigation	Significance of Residual Impacts
					woodland, hedgerow and grassland habitats
Fish and Crayfish	Accidental introduction of pollutants into the habitats utilised by fish and crayfish present downstream of the site.	High Local	Temporary negative impact of slight significance	Strict adherence to: - The mitigations outlined in Sub-sections 7.1.1, 7.1.2, 7.1.3, 7.1.4 and 7.1.5 ensuring the protection of local aquatic habitats which are flow downstream to areas of Fish and Crayfish population	Neutral residual impact during the operational phase

9.2 Cumulative Impacts

As there are no significant residual impacts on ecological features (following mitigation measures) from this development, there is therefore no potential for other plans or projects identified in Section 5 to act in combination with it. Therefore, significant cumulative impacts are not expected to occur on the ecological features within the proposed site.

10 Conclusion

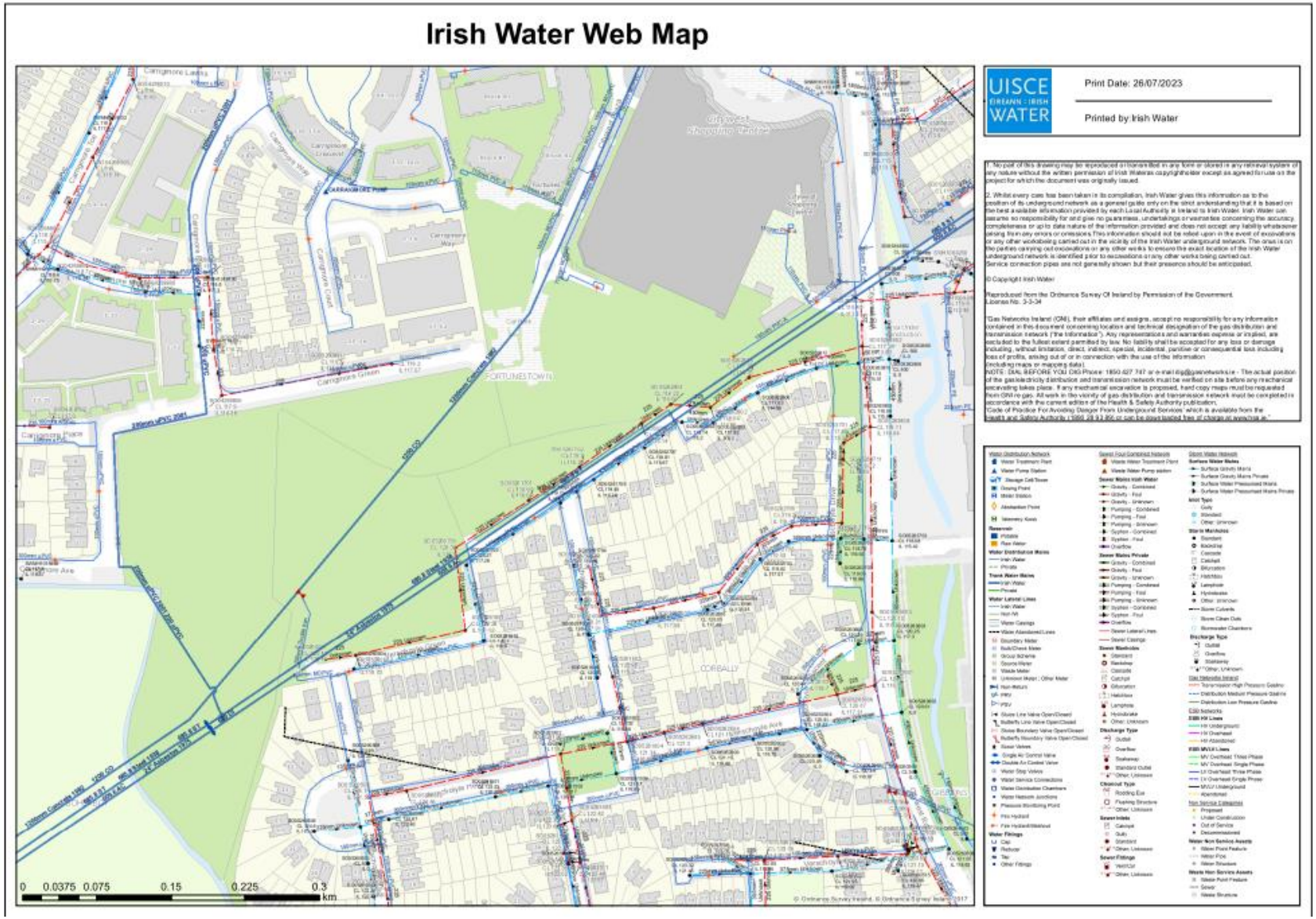
The proposed development project has been shown to potentially impact a number of different habitats with high local importance (dry meadows and grassy verges; hedgerow, treelines, eroding/upland rivers and drainage ditches) and faunal groups (ground-dwelling mammals; bats; breeding birds and amphibians), whose ecological importance is of high local level in the context of this proposed site.

Based upon the information supplied, regarding the site layout, drainage and landscape plans, and provided that the development is constructed in accordance with the mitigation measures outlined above, there will be no significant impacts alone or in-combination with other projects and plans, as result of the development and associated works on the ecology and local species of the area and on any designated conservation sites.

Given the scale of this development and its suitable landscape plan, the local ecology, including mammals, bats, birds and invertebrate species, will benefit from the maintained ecological function of the site (enhancement of tree and shrub habitats, implementation of wetland habitats and installation of bat boxes) associated with the operational phase of this project.

A Site Layout Plan

B Site Drainage Plan



C Relevant Policy and Legislation

The legislation discussed below is intended as a guide only and does not replace formal legal advice.

C.1 Biodiversity Policy Guidance

'Biodiversity: The National Biodiversity Action Plan 2017-2021 (DCHG, 2017) sets out actions through which a range of government, civil and private sectors will undertake to achieve Ireland's 'Vision for Biodiversity' and has been developed in response to The Earth Summit, held in Rio de Janeiro in 1992 (UN Convention on Biological Diversity) and subsequent EU and International Biodiversity strategies and policies.

As part of the Action Plan process Local Authorities (LA) must produce Biodiversity Action Plans (BAP). BAPs highlight local biodiversity issues and set out a series of objectives and action plans for the conservation of priority species and habitats where they occur in each district or county.

C.2 Designated Sites and Nature Conservation

C.2.1 Statutory Designated Nature Conservation Sites

Sites with statutory designations receive varying degrees of legal protection under Irish statute (i.e. Wildlife Act 1976 and Wildlife (Amendment) Act (2000) and European Directives (i.e. the EC Birds Directive (2009/147/EC) and EC Habitats Directive (92/43/EC). The EU directives were transposed into Irish national law and subsequent amendments were revised and consolidated in the European Communities (Birds and Natural Habitats) Regulations 2011 and Irish Statutory Instrument 477/2011

There are a number of statutory designations used for sites of high nature conservation value in Ireland, which are applied depending upon the importance of the site in a local, regional, national or international context. These include:

- National
- Natural Heritage Area (NHA)
- Wildfowl Sanctuary
- Statutory Nature Reserve
- Refuge for Fauna
- European
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- International
- UNESCO Biosphere Reserve
- Ramsar Convention Site
- National Park (Category II) Sites

C.2.2 Non-Statutory Designations

Non-statutory sites are afforded no statutory legal protection, but are normally recognised by local planning authorities and statutory agencies as being of local nature conservation value

A proposed Natural Heritage Area (pNHA) is an area deemed to be of special interest containing important wildlife habitat and often containing rare or threatened species. They may also be selected on the basis of their geology or geomorphology.

C.2.3 Protected and Notable Species

A number of species are protected under Irish and international legislation. In Ireland, primary protection is provided under the 1976 Wildlife Act and Wildlife (Amendment) Acts (2000 & 2010) and revision 2018. Species of European importance receive additional protection in Ireland under the Birds and Natural habitats Regulations 2011.

The Flora (Protection) Order (2015) makes it illegal to cut, uproot or damage a listed species in any way. It is illegal to alter, damage or interfere in any way with their habitats.

D National Biodiversity Data Centre (2023)

D.1 Recent records (within 10 years) of protected species within the 5km of the site

Common Name	Date of Last Record	Designation
Amphibians		
Common Frog *Rana temporaria*	20/03/2023	EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Birds		
Barn Swallow *Hirundo rustica*	07/05/2020	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Black-headed Gull *Larus ridibundus*	17/02/2023	Protected Species: Wildlife Acts Birds of Conservation Concern - AmberList
Common Coot *Fulica atra*	03/02/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex II & Annex III Birds of Conservation Concern - Amber List
Common Kingfisher *Alcedo atthis*	10/02/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex I Birds of Conservation Concern - Amber List
Common Linnet *Carduelis cannabina*	16/01/2021	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Common Pheasant *Phasianus colchicus*	09/05/2020	Protected Species: Wildlife Acts EU Birds Directive >> Annex II & Annex III
Common Pochard *Aythya ferina*	11/01/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex II & Annex III Birds of Conservation Concern - Amber List
Common Starling *Sturnus vulgaris*	23/02/2023	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Common Swift *Apus apus*	27/10/2022	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Common Wood Pigeon *Columba palumbus*	04/02/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex II & Annex III Section I Bird Species
Eurasian Curlew *Numenius arquata*	26/12/2016	Protected Species: Wildlife Acts EU Birds Directive >> Annex II Birds of Conservation Concern - Red List
Eurasian Teal *Anas crecca*	12/02/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex II & Annex III Birds of Conservation Concern - Amber List
Great Cormorant *Phalacrocorax carbo*	11/01/2023	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Hen Harrier *Circus cyaneus*	22/03/2019	Protected Species: Wildlife Acts EU Birds Directive >> Annex I Birds of Conservation Concern - Amber List
Herring Gull *Larus argentatus*	26/12/2020	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
House Martin *Delichon urbicum*	09/05/2020	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
House Sparrow *Passer domesticus*	11/01/2023	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Lesser Black-backed Gull *Larus fuscus*	16/04/2020	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Little Egret *Egretta garzetta*	02/01/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex I Bird Species
Little Grebe *Tachybaptus ruficollis*	11/01/2023	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List

Common Name	Date of Last Record	Designation
Mallard *Anas platyrhynchos*	03/02/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex II & Annex III
Common Gull *Larus canus*	28/01/2023	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Mute Swan *Cygnus olor*	03/02/2023	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Northern Wheatear *Oenanthe oenanthe*	09/05/2020	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Peregrine Falcon *Falco peregrinus*	04/02/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex I Bird Species
Rock Pigeon *Columba livia*	06/02/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex II
Sand Martin *Riparia riparia*	03/04/2021	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Sky Lark *Alauda arvensis*	09/05/2020	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Tufted Duck *Aythya fuligula*	22/01/2023	Protected Species: Wildlife Acts EU Birds Directive >> Annex II & Annex III Birds of Conservation Concern - Amber List
Yellowhammer *Emberiza citrinella*	10/06/2021	Protected Species: Wildlife Acts Birds of Conservation Concern - Red List
Invertebrates		
Freshwater White-clawed Crayfish *Austropotamobius pallipes*	18/08/2013	EU Habitats Directive >> Annex II & Annex V Protected Species: Wildlife Acts
Mammals		
Daubenton's Bat *Myotis daubentonii*	26/08/2014	EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Eurasian Badger *Meles meles*	14/05/2018	Protected Species: Wildlife Acts
Eurasian Pygmy Shrew *Sorex minutus*	15/09/2015	Protected Species: Wildlife Acts
Eurasian Red Squirrel *Sciurus vulgaris*	02/06/2018	Protected Species: Wildlife Acts
European Otter *Lutra lutra*	25/06/2016	EU Habitats Directive >> Annex II & Annex IV Protected Species: Wildlife Acts
Pine Marten *Martes martes*	25/06/2020	EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Red Deer *Cervus elaphus*	09/11/2015	Protected Species: Wildlife Acts
Soprano Pipistrelle *Pipistrellus pygmaeus*	19/08/2013	EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
West European Hedgehog *Erinaceus europaeus*	03/12/2022	Protected Species: Wildlife Acts

D.2 Recent records (within 10 years) of invasive species within the 5km of the site

Common Name	Date of Last Record	Designation
Flora		
American Skunk-cabbage *Lysichiton americanus*	05/04/2020	Medium Impact Invasive Species EU Regulation No. 1143/2014 Regulation S.I. 477 (Ireland)
Black Currant *Ribes nigrum*	16/09/2017	Medium Impact Invasive Species
Butterfly-bush *Buddleja davidii*	26/03/2022	Medium Impact Invasive Species
Cherry Laurel *Prunus laurocerasus*	18/04/2022	High Impact Invasive Species
Fringed Water-lily *Nymphoides peltata*	15/06/2016	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Giant Hogweed *Heracleum mantegazzianum*	22/06/2021	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Giant Knotweed *Fallopia sachalinensis*	06/06/2021	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Indian Balsam *Impatiens glandulifera*	24/08/2021	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Japanese Knotweed *Fallopia japonica*	16/08/2022	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Nuttall's Waterweed *Elodea nuttallii*	18/07/2020	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Russian-vine *Fallopia baldschuanica*	08/05/2014	Medium Impact Invasive Species
Spanish Bluebell *Hyacinthoides hispanica*	18/04/2022	Low Impact Invasive Species Regulation S.I. 477 (Ireland)
Sycamore *Acer pseudoplatanus*	18/04/2022	Medium Impact Invasive Species
Three-cornered Garlic *Allium triquetrum*	07/05/2022	Medium Impact Invasive Species Regulation S.I. 477 (Ireland)
Wild Parsnip *Pastinaca sativa*	11/07/2015	Medium Impact Invasive Species
Invertebrates		
Harlequin Ladybird *Harmonia axyridis*	16/03/2023	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Jenkins' Spire Snail *Potamopyrgus antipodarum*	22/06/2016	Medium Impact Invasive Species
Reptile		
Red-eared Terrapin *Trachemys scripta*	10/06/2021	Medium Impact Invasive Species EU Regulation No. 1143/2014
Mammals		
American Mink *Mustela vison*	30/07/2018	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Brown Rat *Rattus norvegicus*	09/10/2015	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Eastern Grey Squirrel *Sciurus carolinensis*	07/09/2022	High Impact Invasive Species EU Regulation No. 1143/2014 Regulation S.I. 477 (Ireland)
European Rabbit *Oryctolagus cuniculus*	25/10/2018	Medium Impact Invasive Species
Greater White-toothed Shrew *Crocidura russula*	26/03/2020	Medium Impact Invasive Species

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