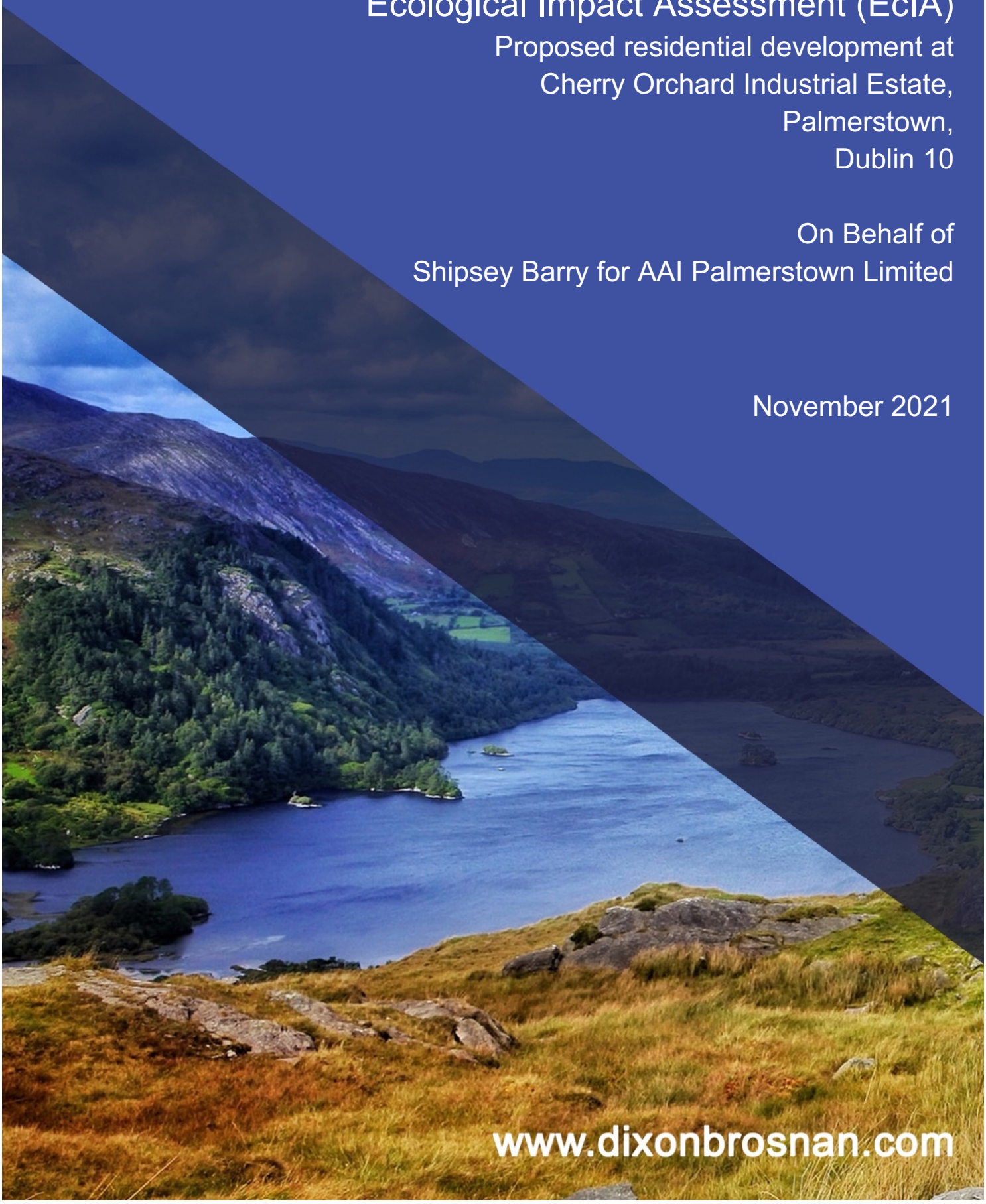
DixonBrosnan
environmental consultants

Ecological Impact Assessment (EcIA)

Proposed residential development at
Cherry Orchard Industrial Estate,
Palmerstown,
Dublin 10

On Behalf of
Shipsey Barry for AAI Palmerstown Limited

November 2021



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Client	Shipsey Barry for AAI Palmerstown Limited	
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30/04/21	1st Draft	Carl Dixon Sorcha Sheehy
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1. Introduction

DixonBrosnan Environmental Consultants were commissioned to assess the potential impacts on terrestrial and aquatic flora and fauna from a proposed residential development and all associated site works at Units 64 & 65, Cherry Orchard Industrial Estate, Palmerstown, Dublin 10. This report describes and evaluates the habitats with their representative flora and fauna and addresses the potential impacts of the development on the ecology of the site and the surrounding area.

2. Methodology

2.1 Introduction

This appraisal is based on surveys of the proposed works area and a review of desktop data. Although not part of an environmental impact assessment report (EIAR) this report follows the structure and protocols detailed in *Advice notes for preparing Environmental Impact Statements* (EPA Draft, 2015) and *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'* (EPA, May 2017).

2.2 Desktop Review

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

- National Parks & Wildlife Service (NPWS) - www.npws.ie
- Environmental Protection Agency (EPA) – www.epa.ie
- National Biodiversity Data Centre – www.biodiversityireland.ie
- South Dublin County Council Development Plan 2016-2022 (South Dublin County Council, 2016)
- *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011)
- *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (National Roads Authority, 2009)
- *Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU)* European Union, 2017 and
- Ringsend WWTP (Reg D0034-01) Annual Environmental Report (AER) 2020 (Irish Water 2021)

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

2.2.1 Relevant Legislation

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

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

The categories of designation are as follows:

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

2.3 Survey Overview

A site visit was carried out on the 21st of April 2021. It is noted that this survey was conducted inside the growing season and within the breeding season for birds. The following surveys were carried out at the site:

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

This report was prepared by Carl Dixon MSc. (Ecological Monitoring), Sorcha Sheehy PhD (Ecology/Ornithology) and Cian Gill MSc (Ecology).

Carl Dixon MSc (Ecology) is a senior ecologist who has over 20 years' experience in ecological and water quality assessments with particular expertise in freshwater ecology. He also has experience in mammal surveys, invasive species surveys and ecological supervision of large-scale projects. Projects in recent years include the Waste to Energy Facility Ringaskiddy, Shannon LNG Project, supervision of the Fermoy Flood Relief Scheme, Skibbereen Flood Relief Scheme, Upgrade of Mallow WWTP Scheme, Douglas Flood Relief Scheme, Great Island Gas Pipeline etc. He has carried out ecological surveys and prepared AA/NIS reports for a range of projects.

Sorcha Sheehy PhD (ecology/ornithology) is an experienced ecological consultant with over ten years' experience. She has worked on Screening/NIS's for a range of small and large-

scale projects with particular expertise in assessing impacts on birds. Recent projects include bird risk assessments for Dublin and Cork Airports, Waste to Energy Facility Ringaskiddy and Water Storage Schemes for Irish Water.

Cian Gill MSc (Ecology) is a qualified ecologist with ten years' experience working with wildlife and ecology-based NGOs and public bodies in Ireland, the UK and the US. Past projects include invasive species planning for the city of Rosemount, Minnesota, and the Under The Sea project for Essex Wildlife Trust. Recent projects include ecological reports for Cork-based housing and private developments.

3. Receiving Environment

3.1 Existing Site and Environs

The proposed development site is located at the former warehouse facility at units 64 & 65, Cherry Orchard Industrial Estate (**Figure 1**). The site presents a gateway location at the Western junction of Kennelsfort Road Upper and the Eastern industrial estate. The existing buildings on the site will be demolished and the existing surface & foul drainage and watermain lines on the site will be grubbed up and removed. The proposed site measures approximately 0.763ha.

The site is bound by the Kennelsfort Road Upper to the west, Cherry Orchard Industrial Estate Road to the south. There are retail units to the northern boundary of the site and warehouse units to the east. The topography of the site shows a decrease in level of the surrounding roads falling from south to north along Kennelsfort Road Upper. However, due to its previous development, the site itself remains fairly level and the interfaces between the site and the surrounds are relatively level. At the east boundary, the elevation rises from the site to the road and at the south road boundaries the site is similar level to the road.

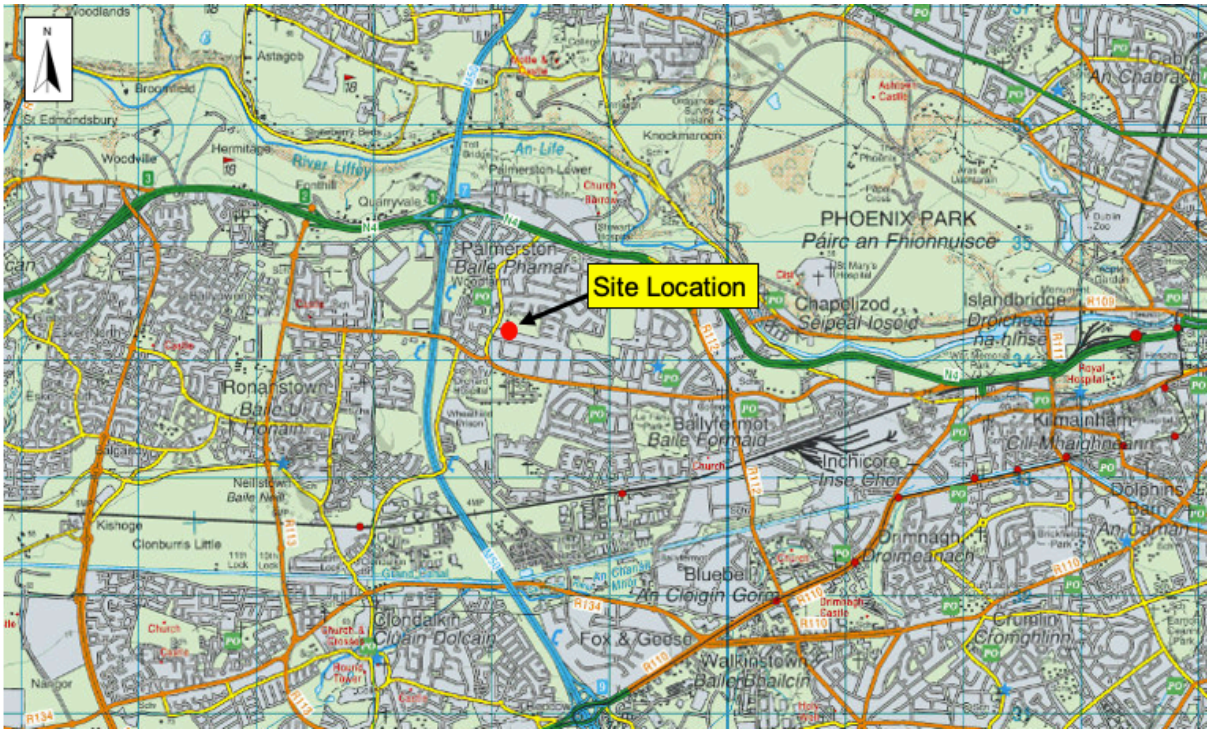

Figure 1. Site location| Source OSI.ie

Figure 2. Site boundary and local enviros | Source OSI.ie

3.2 Proposed Development

Proposed on the site are four apartment blocks, ranging in height between five and nine storeys. The proposal is for 148 apartments and associated facilities with a mix of one-bedroom apartments and two bedroom apartments. On-site parking is contained within a landscaped podium element with 2 on street go-car spaces provided. Vehicular access to the site will be provided in the southeast corner from Cherry Orchard Industrial Estate road. The podium green space is centrally located, and the four apartment buildings are set out around this, with access to the green space. Two buildings have direct access to the public street to the west and south respectively. The landscaped podium is accessible from both external public roads via steps. The parking area is located below the podium level and is accessed directly from road level along the southern boundary as noted above. All necessary services for the buildings are to be provided and connected into existing services in the area.

An overview of the proposed development site is shown in **Figure 3**.

Figure 3. Approximate overview of proposed development site | Source ShipseyBarry

3.2.1 Surface Water Drainage

Local Authorities require that all developments must include a sustainable urban drainage system, SUDS. A combination of SuDs mechanisms will be utilised on this site. This includes; permeable surfacing with stone storage, bio retention landscaped areas and tree pits, stone storage systems fed by slot drains on the podium slab and green roofing. Based on the combined approach an attenuation tank is not required. All possible SuDs mechanisms have been explored. Given the nature of the site with the building layout, podium slab and limited open space at ground level it is not feasible to utilize swales, ponds etc. The site investigation indicates that infiltration is not available. On this basis the subbase of the porous asphalt is designed to store the run-off generated by storm events. Green roofs have been provided on the apartment blocks for the most part.

To alleviate any possible risk of flood the on-site surface water storage is designed for a 1 in 100-year storm (+20%). A 20% increase in runoff due to global warming is included as per “Greater Dublin Regional Code of Practice for Drainage Works” and the “GDSDS”. Site specific MET Eireann Rainfall data has been used in the surface water drainage and attenuation design. Site specific MET Eireann Rainfall data has been used in the surface water drainage and attenuation design. The surface water will be dealt with and stored on site and a connection to the existing surface water drainage system will be used to dispose of the surface water from the developed site. To provide the required attenuation volume the stone sub bases have been designed as storage. A connection to the public surface water system (750mm dia. Surface water pipe) on the Cherry Orchard Industrial Estate road south of the

site via a hydrobrake limiting discharge to 2 L/s. Site specific Greenfield runoff rate has been used in the calculations. Based on this this flow rate and the site hard standing the required volume for each area has been calculated.

The surface water strategy for each hard standing area is outlined below.

- The stone storage on the podium will be used to deal with the surface water in this area. A stone paving with falls to slot drains and a stone sub base build up will be provided.
- The external perimeter path will be dealt with via falls on the hard standing area to the tree pits and bioretention rain landscaped areas at street level
- The entrance road surfacing will take the form of porous asphalt and will provide storage for the run-off from the road, car park area and the roof area (450mm depth)

The surface run-off from the car park will be connected to the stone buildup in the porous asphalt entrance road via a petrol interceptor (Kingspan NSBP003). The proposed car park drainage layout for the development and the location of petrol interceptor is indicated on the drainage layout. The car park drainage will consist of a standard concrete finish car park slab laid to falls to surface water gullies and below slab 150mm diameter pipes.

There is an existing 225mm public surface water sewer traversing the site to the west. 2HP confirm a wayleave will be registered with the Property Registration Authority in favour of South Dublin County Council in relation to the existing sewer where it traverses the site. The extents of the wayleave will be agreed with South Dublin County Council. A minimum clear setback distance of 3m will be provided between all structures and trees and the centreline of the surface water sewer.

There will be a complete separation of the foul and surface water drainage systems within the site, both in respect of installation and use. The surface water drains are designed in accordance with BS EN 752, Code of Practice for Drainage Outside Buildings.

3.2.2. Foul Water Drainage

The foul drainage system has been designed in accordance with Irish Water Code of Practice and Standard Details for Wastewater, BS 8301:1985, Code of Practice for Building Drainage and the current Building Regulations and Irish Water Code of Practice.

The foul drainage system for the development is a gravity feed system falling to the public foul drainage system (225mm dia. foul water pipe) on the Cherry Orchard Industrial Estate road south of the site on site. The development will not result in a significant increase in foul discharge from the site on the public sewer and we do not anticipate any capacity problems. The main foul sewers in the proposed development are to consist of 225mm diameter uPVC pipes with fall 1/170 chosen throughout to minimise the risk of blockages and to aid maintenance. Based on the 225mm diameter pipes with a 1:170 fall, the design flow is calculated as 34.94 l/s. A roughness coefficient (ks) of 1.5mm is applied to the design of all pipes.

A Confirmation of Feasibility and Statement of Design Acceptance for the development has been received from Irish Water, refer to letter contained in **Appendix 2**. Irish Water have

confirmed the development is feasible without upgrade by Irish Water. The drawings included with the planning application show the proposed foul drainage layout.

3.2.3. Water Supply System

There is an existing 150mm diameter asbestos water main on the Cherry Orchard Industrial Estate road south of the site on site. A looped 100mm diameter HDPE watermain will be installed on site with a new connection to this public water main.

In accordance with requirements air valves and scour valves will be provided around the site as necessary. Hydrants will be provided as directed by the Fire Safety Certificate and Technical Guidance Document B of the Building Regulations 2006. Water saving devices including aerated taps and low water usage appliances will be used in the proposed development in accordance with best practice. The water supply system has been designed and will be installed in accordance with Irish Water Code of Practice and Standard Details for Water. Confirmation of Feasibility and Statement of Design Acceptance for the development has been received from Irish Water, refer to letter contained in **Appendix 2**. Irish Water have confirmed the development is feasible without upgrade by Irish Water.

3.2.4. Flood Risk Assessment

Initially a desktop flood risk assessment was undertaken to identify possible sources of flooding and the risk posed to the development, and separately the risk posed to surrounding areas because of the development. A number of sources of information were reviewed including the OPW's websites, www.floodmaps.ie and www.floodinfo.ie, and Appendix 13 of Dún Laoghaire-Rathdown County Development Plan 2016-2022.

External Sources

The site is situated far enough away from the sea not to be subjected to coastal or tidal flooding. The OPW flood mapping website, www.floodmaps.ie has been reviewed, and from the information contained in this report it is evident that the site has not been subjected to flooding during previously reported flooding events. The surrounding land slopes away from the site. As such it is reasonable to assume there is no risk to the proposed development resulting from flooding off-site.

Internal sources

It is intended that all surface water run off generated by the 1in100 year storm will be dealt with via attenuation tank storage and porous surfacing. An allowance has been made for a 20% increase in runoff due to global warming, as per the "Greater Dublin Strategic Drainage Study" recommendations. As such the proposed development is deemed not to be subjected to pluvial flooding from internal sources.

Due to all these factors the risk of flooding is deemed to be minimal.

4. Designated Conservation Areas

4.1 European (Natura 2000) Sites

Special Areas of Conservation (SACs) and candidate SACs are protected under the Habitats Directive 92/43/EEC and the European Communities (Birds and Natural Habitats) Regulations

2011, as amended. Special Protection Areas (SPAs) are protected under the Birds Directive 2009/147/EC and European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Collectively, these sites are referred to as Natura 2000 or European sites. Natural Heritage Areas (NHAs/pNHAs) are national designations under the Wildlife Act 1976, as amended. A Natural Heritage Area (NHA) is designated for its wildlife value and receives statutory protection. A list of proposed NHAs (pNHAs) was published on a non-statutory basis in 1995, but these have not since been statutorily proposed or designated. Consultation with the NPWS is still required if any development is likely to impact on a pNHA.

There are no environmental designations pertaining to the study area. Thus, the site of the proposed development does not form part of any Natural Heritage Area (NHA), Special Protection Area (SPA), Special Area of Conservation (SAC) or candidate Special Area of Conservation (cSAC), Nature Reserve, or National Park.

Relevant designated sites, along with their distance from the site of the proposed development, are listed in **Table 1**. These Natura 2000 sites are shown in **Figure 4**.

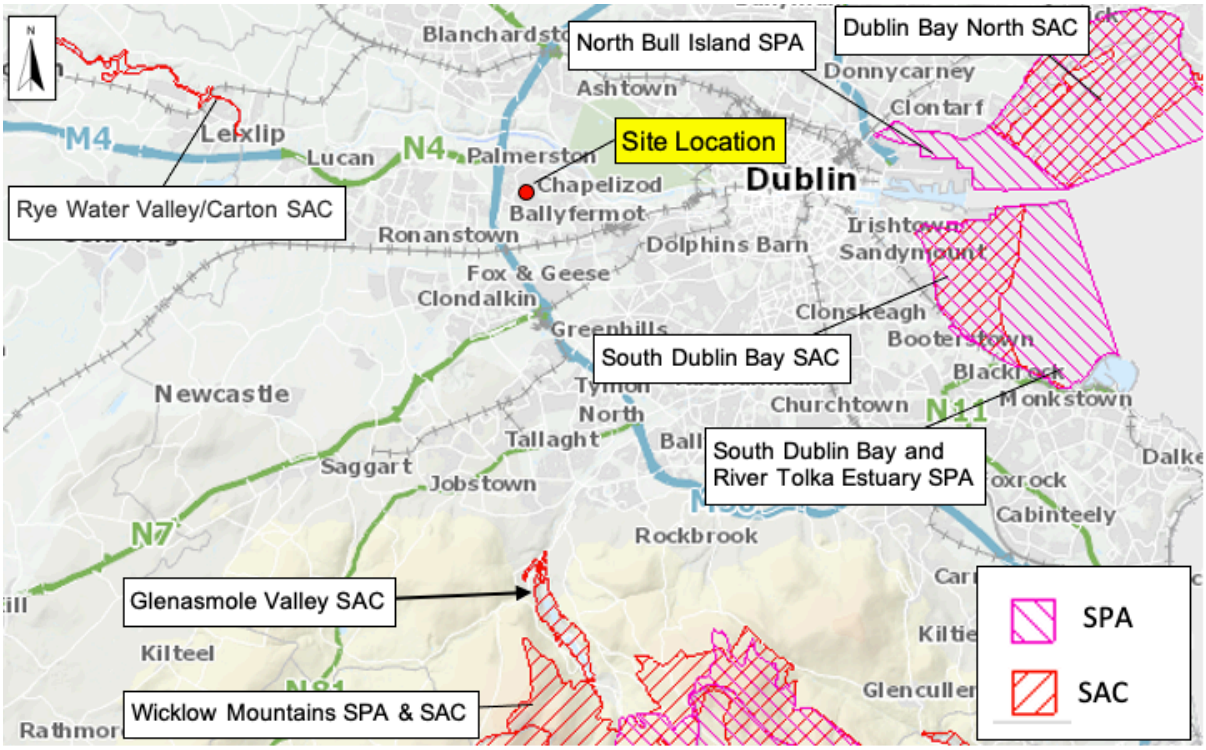

Figure 4. Location of the proposed development site and Natura 2000 sites within a 15km radius | Source: EPA Envision mapping https://gis.epa.ie/EPAMaps/) | Not to scale

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

Designated Sites	Site Code	Approx. Distance at closest point
Special Area of Conservation (SAC)		
Rye Water Valley/Carton SAC	001398	8.0km west
Glenasmole Valley SAC	001209	9.95km south
South Dublin Bay SAC	000210	11.1km east
Wicklow Mountains SAC	001209	12.3km south
North Dublin Bay SAC	000206	13.2km east
Special Protection Area (SPA)		
South Dublin Bay and River Tolka Estuary SPA	004024	10km east
North Bull Island SPA	004006	13.3km
Wicklow Mountains	004040	13.2km south east
Natural Heritage Areas (NHA) or proposed Natural Heritage Areas (pNHA)		
Liffey Valley pNHA	000128	1.0km north
Grand Canal pNHA	002104	2.0km south
Royal Canal pNHA	002103	4.0km north
North Dublin Bay pNHA	000206	10.1km east
South Dublin Bay pNHA	000210	11.3km southeast

An Appropriate Assessment Screening was carried out for the proposed development and submitted with this application: *Report in Support of Appropriate Assessment Screening for Proposed Residential Development at Cherry Orchard Industrial Estate. (DixonBrosnan 2021).*

The conclusions of the report were as follows:

Through an assessment of the source-pathway-receptor model, which considered the ZoI of effects from the proposed development and the potential in-combination effects with other plans or projects, the following findings were reported:

- *The proposed development at Units 64 & 65, Cherry Orchard Industrial Estate, Palmerstown, Dublin 10 either alone or in-combination with other plans and/or projects, does not have the potential to significantly affect any European Site, in light of their conservation objectives.*

Therefore, a Stage 2 Appropriate Assessment is deemed not to be required.

4.2 Nationally Protected Sites

Natural Heritage Areas (NHAs/pNHAs) are national designations under the Wildlife Act 1976, as amended. A Natural Heritage Area (NHA) is designated for its wildlife value and receives statutory protection. A list of proposed NHAs (pNHAs) was published on a non-statutory basis in 1995, but these have not since been statutorily proposed or designated. NHAs and pNHAs in the vicinity of the proposed development site are listed in **Table 1** and illustrated in **Figure 5**.

There are no NHAs or pNHAs in proximity to the proposed development site. The closest pNHA is the Liffey Valley pNHA located 1km away. Surface and wastewater discharges from the proposed development will be conveyed to the Ringsend WWTP for treatment prior to discharging into the Dublin Bay/ Liffey Estuary Lower. Two pNHA sites listed in **Table 1** are located within Dublin Bay (North Dublin Bay pNHA and South Dublin Bay pNHA). Protected species and habitats within these sites could potentially be impacted via a reduction in water quality.

There is no hydrological or other connection between the proposed development site and any other NHA or pNHA.

Figure 5. Proposed Natural Heritage Areas (pNHAs) in the vicinity of the proposed development site | Source: EPA Envision mapping | Not to scale

4.3 Ramsar Sites

The Convention on Wetlands, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. A key commitment of Ramsar Contracting Parties is to identify and place suitable wetlands onto the List of Wetlands of International Importance. Baldoyle Bay, North Bull Island and Sandymount Strand/Tolka Estuary are listed as Ramsar sites. This is a non-statutory designation.

4.4 Important Bird Areas

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

maintained, and where possible enhanced. The programme aims to guide the implementation of national conservation strategies, through the promotion and development of national protected-area programmes. Through their designation they aim to form a network of sites ensuring that migratory species find suitable breeding, stop-over and wintering places along their respective flyways.

The function of the Important Bird Area (IBA) programme is to identify, protect and manage a network of sites that are important for the long-term viability of naturally occurring bird populations, across the geographical range of those bird species for which a site-based approach is appropriate. The proposed Cherry Orchard development site lies within 10km of a number of IBA sites, mainly Dublin Bay (Site Code; IE109), Baldoyle Bay (Site Code; IE112), Howth Head (Site Code; IE110) and Wicklow Mountains (Site Code; IE106).

5. Habitats

A site survey was carried out on the 21st of April 2021. Habitat mapping was carried out in line with the methodology outlined in the *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011). The terrestrial and aquatic habitats within or adjacent to the proposed development site was classified using the classification scheme outlined in the Heritage council publication *A Guide to Habitats in Ireland* (Fossitt, 2000) and cross referenced with Annex I Habitats where required.

An overview of the current habitats recorded within the site is shown in **Figure 6** and the habitats recorded on site are described in **Table 2**. Photographs of the site are also included below.

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

No Annex I habitats were recorded within the proposed development site. No protected species were recorded during the site visits. Overall, the site is considered a highly modified and disturbed habitat, with low species diversity and low ecological value.

Table 2. Habitat present and their relative value

Habitat	Comments	Ecological value (NRA guidelines)
Buildings and artificial surfaces (BL3)	This habitat includes the main vacant two story warehouse structure and the surrounding concrete surfaces. The lower half of the building is brick, with corrugated metal on its upper level and roof. Also noted were various vents, entrance structures, industrial-sized automatic gates/doors. All doors/openings were securely locked. No broken windows or any other available entrances were noted. Refer to **Photos 1** to **3.**	Local importance (Lower value)
Treelines (WL2)	A planted treeline runs along the southern boundary of the site, within the grass verge of the public road. The treeline is composed of non-native species, mostly Hybrid Black Poplar (*Populus x canadensis*) and occasional Norway Maple (*Acer platanoides*). Refer to **Photo 4.** A small stand of Hybrid Black Poplar are located at the north west corner of the site. Treelines can provide habitat for foraging, roosting and breeding birds whilst also providing ecological corridors facilitating bird and other animal movement.	Local importance (Lower value)
Recolonising bare ground (ED3)	Situated in the north and west of the building are areas of concrete ground which has been recolonised by mixture of common species which are typical of disturbed ground habitats.. Species noted include Dandelion (*Taraxacum* spp), Ragwort (*Senecio jacobaea*), Greater Plantain (*Plantago major)*, Cleaver (*Galium aparine*), Ivy (*Hedera helix*), Cocksfoot (*Dactylus* spp) and some young Willow saplings (*Salix* spp). The invasive species Buddleia (*Buddleja davidii*) was also recorded at the south west corner of the building. This is generally a highly modified and frequently disturbed habitat with low species diversity and limited ecological value.	Local importance (Lower value)

Photo 1: Building facing south

Photo 2: Building facing east

Photo 3: Western side of site with recolonised bare ground in foreground.

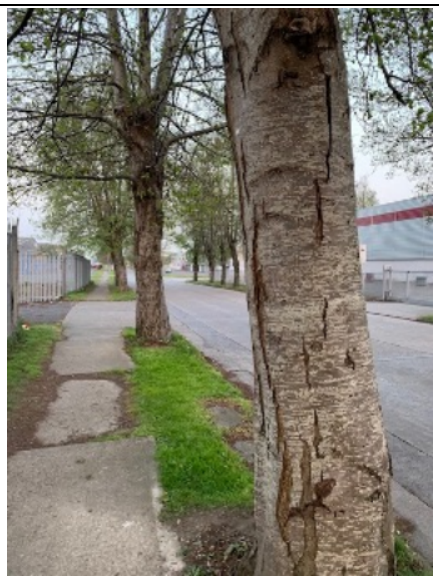

Photo 4: Treelines along southern boundary

Figure 6. Habitat map of proposed development site (all lines indictive)

6. Flora

The National Biodiversity Data Centre's (NBDC) online database provides data on the distribution of species within 10km grid squares. The site of the proposed development lies within 10 Km square O03 of Ordnance Survey Ireland's National Grid System. The NBDC lists some 469 flora species as being present within grid square O03. Endangered and protected

species recorded by the NBDC are listed in **Table 3.** Three species recorded within O03 are listed under the Flora Protection Order 2015 (S.I. 356 of 2015).

These species were not recorded within study area during site survey. No rare species were recorded during the site survey, nor are they expected to occur given that the habitats within the study area are common.

Table 3. NBDC listed endangered and protected flowering species for O03

Flowering plant Species	Latin Name	Designations
Green Figwort	*Scrophularia umbrosa*	Threatened Species: Endangered
Meadow Barley	*Hordeum secalinum*	Flora Protection Order (S.I. 356 of 2015). Threatened Species: Endangered
Opposite-leaved Pondweed	*Groenlandia densa*	Flora Protection Order (S.I. 356 of 2015). Threatened Species: Endangered
Hairy St John's-wort	*Hypericum hirsutum*	Flora Protection Order (S.I. 356 of 2015). Threatened Species: Endangered
Cornflower	*Centaurea cyanus*	Threatened Species: Regionally Extinct
	Lamiastrum galeobdolon subsp. montanum	Threatened Species: Vulnerable
Spring vetch	*Vicia lathyroides*	Threatened Species: Vulnerable

Source: NBDC 22/11/21

7. Fauna

7.1 Bats

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

- Intentionally kill, injure or take a bat
- Possess or control any live or dead specimen or anything derived from a bat
- Wilfully interfere with any structure or place used for breeding or resting by a bat
- Wilfully interfere with a bat while it is occupying a structure or place which it uses for that purpose.

In addition to domestic legislation bats are also protected under the EU Habitats Directive (92/43/EEC) with all bat species are listed in Annex IV of the Directive. The Irish government is also a signatory to the 1979 Bonn convention (Convention on the conservation of migratory

species of wild animals) and the 1982 Bern convention (The convention on the conservation of European wildlife and natural habitats) and has a commitment to the 1991 Eurobats agreement (Agreement on the conservation of bats in Europe).

In Ireland, nine species of bat are currently known to be resident. These are classified into two Families: the *Rhinolophidae* (Horseshoe bats) and the *Vespertilionidae* (Common bats). The lesser horseshoe bat *Rhinolophus hipposideros* is the only representative of the former Family in Ireland. All the other Irish bat species are of the latter Family and these include three pipistrelle species: common *Pipistrellus pipistrellus*, soprano *P. pygmaeus* and Nathusius' *P. nathusii*, four *Myotids*: Natterer's *Myotis nattereri*, Daubenton's *M. daubentonii*, whiskered *M. mystacinus*, the brown long-eared *Plecotus auritus* and Leisler's *Nyctalus leisleri* bats. The Irish Red Data Book 12: Vertebrates (Marnell, Looney & Lawton 2019) lists that all species of Irish bats are of Least Concern status. The Brandt's bat is considered a vagrant species (Marnell, Looney & Lawton 2019).

Whiskered and Natterer's bats are recorded throughout Ireland but are not common. Ireland is considered to be an international stronghold for Leisler's bat and may constitute as much as 20-25% of global population. It is probably the third most common bat species (Roche *et al*. 2011) with estimates of 70,000-130,000 mature individuals.

A review of existing bat records within grid square O03 (sourced NBDC) showed that the all resident species with the exception of the Lesser Horseshoe are recorded locally **Table 4**. Lesser Horseshoe Bat is the only species of bat listed on Annex II of the Habitats Directive (Directive 92/43/EEC). The proposed development site location is outside of the Lesser Horse-shoe bat range, which is along the western counties of Ireland from Mayo to Cork.

Table 4. Presence of Irish bat species within O03

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

Source: NBDC 19/04/21

A study by Lundy *et al.* (2011) examined the relative importance of landscape and habitat associations across Ireland. Maximum Entropy Models (MEM) were constructed for each bat species using records from the National Bat Database from 2000-2009. This method allows species' records that have not been collected in a systematic survey to be analysed. The results help explain patterns of species' occurrence and predict where species might occur. Landcover (CORINE), topography, climate, soil pH, riparian habitat and human bias factors were incorporated into the models. The analyses provide a picture of the broad scale geographic patterns of occurrence and local roosting habitat requirements for Irish bat species. This also provides a 'habitat suitability' index. The index ranges from 0 to 100, with 0

being least favourable and 100 most favourable for bats. The habitat indices for all Irish bats for the landscape within the vicinity of the proposed development sit is shown in **Table 5**.

Table 5. Model Predicted Habitat suitability indices for All Irish bat species at the proposed development site

Scientific name	Common name	Presence
All Bats		23.67
Pipistrellus pygmaeus	Soprano pipistrelle	35
Pipistrellus pipistrellus	Common pipistrelle	39
Plecotus auratus	Brown long-eared bat	28
Nyctalus leisleri	Leisler's bat	42
Myotis mystacinus	Whiskered bat	20
Myotis daubentoniid	Daubenton's bat	18
Myotis nattereri	Natterer's bat	16
Pipistrellus nathusii	Nathusius' pipistrelle	15
Rhinolophus hipposideros	Lesser horseshoe	0

Source: NBDC 22/11/21

Soprano and common pipistrelle could occur close to the site as these species can be common in the Irish urban areas. The Leisler's bat could forage in the general area.

Nathusius' pipistrelle and Natterer's bat are rarer Irish species and are unlikely to occur. The built-up nature of the site and surrounding area makes it unsuitable for brown long eared bat or whiskered bat. Daubenton's bat requires freshwater habitat for foraging, which is not present in the vicinity of the site.

Evidence of bat activity associated with potential roost sites includes bat droppings, urine staining, feeding remains and dead/alive bats. Indicators that potential roost locations and access points are likely to be inactive include the presence of cobwebs and general detritus within the apertures. Potential roost features associated with trees include cracks, crevices, loose bark, woodpecker holes and splits. Evidence indicating bat presence, includes dark stains running below holes or cracks, bat droppings, odours, or scratch marks.

Lighting deters some bat species from foraging. Studies have shown that illumination levels as low as 0.06 lux can have an effect on the behaviour of bats. Even a full moon night (0.02 lux) can reduce bat activity to more sheltered, darker wildlife corridors and foraging areas (e.g., woodlands). The slower flying broad-winged species (Natterer's bats, Daubenton's bats, whiskered bats, and brown long-eared bats) have been shown to avoid streetlights.

7.1.1 Preliminary site assessment for suitability for bats

The building proposed for demolition was determined to potentially have bat roost. For this reason, a bat daytime survey and evening emergence survey were carried out.

The treeline at the south of the site and small stand of trees on western boundary were assessed for suitability for bat roosts. An initial ground level inspection of trees determined the trees had a "low" suitability to roosting bats, but due to the proposed construction of buildings in close proximity to the trees, a bat survey was recommended and conducted.

7.1.2 Tree Inspection

Two treelines, predominantly Hybrid Black Poplar and also a Norway Maple, are located along the street at the south of the site. The trees are semi-mature to early mature in age but with a branching structure, which are less suitable for bat roost features.

A daytime ground level roost assessment of the trees was carried out to look for features which could be used by roosting bats (Potential Roost Features (PRF)). PRFs may include holes, cracks and splits. Trees were also examined for signs of bats e.g. grease staining, droppings, urine marks, corpses, feeding signs such as invertebrate prey remains and/or the presence of bat fly Nycteribiidae pupae. Bat droppings are often identifiable to species-level are very distinctive and unmistakable. Observations were made from ground level using binoculars and no trees were climbed.

No sizeable gaps, cracks or cavities large enough to prove useful for bats, nor any droppings, urine stains, feeding remains or dead/alive bats were noted on the trees. No bats or signs of bats were recorded in any of the trees surveyed and in general these trees lack the structural elements or PRFs that would make them suitable as bat roosts. The value of trees within the survey area are considered low. No confirmed bat roosts were found during the daytime bat survey.

7.1.3 Building Visual Inspection

The buildings are intact but disused and are of relatively modern construction. A daytime ground level, roost assessment was carried out to identify presence of any PRFs. This was done in a systematic manner as the buildings/structure is large, moving from wall to wall and examining each possible entry point carefully, paying particular attention to the ground underneath windowsills, window panes, peeling paintwork and gaps in brickwork or in doorways.

No obvious PRF or entrance/emergence points were recorded. Various entrances, doors, gates, external window shutters were examined and all were found to be tightly shut and lacking in any evidence of bat droppings, urine stains, feeding remains or dead/alive bats. Cracks and crevices noted within the external structures of porches, gates and electronic doors were found to be small and not suitable for bat use. Therefore the buildings are considered of low suitability as bat roosts.

7.1.4 Bat Activity Survey (Bat Detector Survey)

A night-time emergence survey was carried out on 21st of April 2021 using a Batbox Duet bat detector. The survey followed the guidelines set out in '*Bat Surveys for Professional*

Ecologists: Good Practice Guidelines (3rd ed)' (Collins, 2016). The survey was carried out during suitable weather conditions for bats (air temperature of 9°C, little wind and dry) and suitable time, starting before sunset and ending over 75 minutes after sunset (8.20pm to 10pm).

The focus of the survey was to determine if bats were roosting in the buildings and trees within the site, and foraging at the site.

No bats were observed emerging from the trees or from the building during the dusk emergence survey, and no bats were observed feeding within the vicinity of the site during the survey.

To summarise, the survey results indicate the buildings and trees are not being used as bat roosts. Furthermore the treelines at the site are not used as commuting routes for bats.

7.2 Other terrestrial mammals

Eighteen other species of terrestrial mammal have been recorded within grid square O03. Nine of which are protected under the Irish Wildlife Act; namely Otter (*Lutra lutra*),, Badger *(Meles meles)*, Pygmy Shrew (*Sorex minutus*), Red Squirrel (*Sciurus vulgaris*), Irish Hare (*Lepus timidus hibernicus*, Pine Marten (*Martes martes*), Red Deer (*Cervus elaphus*), Irish Stoat (*Mustela erminea hibernica*) and Hedgehog (*Erinaceus europaeus*).

7.2.1 Otter

Otters along with their breeding and resting places are protected under the provisions of the Wildlife Act 1976, as amended by the Wildlife (Amendment) Act, 2000. Otters have additional protection because of their inclusion in Annex II and Annex IV of the Habitats Direct which is transposed into Irish law in the European Communities (Natural Habitats) Regulations (S.I 94 of 1997), as amended. Otters are also listed as requiring strict protection in Appendix II of the Berne Convention on the Conservation of European Wildlife and Natural Habitats and are included in the Convention on International Trade of Endangered species (CITES).

There are no watercourses within the proposed development site. Given the urban nature of the site and the distance from the nearest watercourse (1km), the proposed development site is of negligible value for Otter.

7.2.2 Badger

Badgers and their setts are protected under the provisions of the Wildlife Act 1976, as amended, and it is an offence to intentionally, knowingly or unknowingly kill or injure a protected species, or to wilfully interfere with or destroy the breeding site or resting place of a protected wild animal. Badger setts are formed by a complex group of interlinked tunnels, and therefore works in proximity to setts can potentially cause damage a protected species. Badgers are also protected under Appendix III of the Berne.

The site does not contain suitable habitats for Badger and no signs of Badger were recorded during the proposed development site surveys.

7.2.3 Pygmy Shrew

The Pygmy Shrew is common throughout mainland Ireland and has a preference for habitats such as hedgerows and grasslands. Due to the habitats present within the proposed site Pygmy Shrew are unlikely to be present.

7.2.4 Irish Hare

The Irish hare is one of three lagomorphs found on the Island of Ireland and the only native lagomorph. It is listed on Appendix III of the Berne Convention and Annex V(a) of the EC Habitats Directive (92/43/EEC). No sign of hare was recorded within the proposed development site and there is no suitable habitat for this species within the proposed development site.

7.2.5 Hedgehog

The Hedgehog is listed on Appendix III of the Berne Convention can be found throughout Ireland, with male hedgehogs having an annual range of around 56 hectares. Generally, hedgehogs prefer edge habitat and pasture but in recent years have begun to colonize urban areas. There is no suitable habitat for this species within the proposed development site.

7.2.6 Irish Stoat

The Irish Stoat is one of the species protected under regulations (Protection of Wild Animals) in 1980 which enabled Ireland to comply with the provisions of the Bern Convention of European Wildlife and Natural Habitats, which was ratified by Ireland in April 1982. Due to the habitats recorded within the site Irish Stoat is unlikely to occur.

7.2.7 Red Squirrel

The Red Squirrel also listed on Appendix III of the Berne Convention can be found throughout Ireland. Red squirrels feed mainly on tree seeds, although they can utilise fungi, fruit and buds as they become available in the woodland. This species has been recorded on three occasions in O03, the most recent in 2015. There are no suitable habitats for Red Squirrel within the proposed development site.

7.2.8 Red Deer

The Red Deer has established populations in Donegal, Galway, Kerry and Wicklow, with smaller scattered populations in most other counties. In upland areas, red deer are found in open moorland and woodland. Use conifer plantations and secluded woodlands for shelter during winter, when they move to lower altitudes. There is no suitable habitat for this species within the proposed development site.

7.2.9 Pine Marten

Pine Marten is listed Annex V of the EU Habitats Directive 1992 and Appendix III of the Bern Convention 1979, are habitat specialists, requiring forest or scrub habitat to exist in an area. They are adept at climbing trees as they have powerful non-retractable claws. The species is primarily active at night and individuals live in territories that can vary in size from 50 hectares to 400 hectares. There is no suitable habitat for this species within the proposed development site.

7.4 Reptiles and Amphibians

According to records held by the NBDC, Common Frog (*Rana temporaria)* and Smooth Newt (*Lissotriton vulgaris*) have been recorded in grid square O03.

Common Frog is listed on Annex V of the EU Habitats Directive and is protected under the Wildlife Acts. The site and surrounding area has limited suitable habitat for the Common Frog. The species was not recorded during the site visit and due to lack of suitable habitat on the site are unlikely to occur.

Smooth Newt is protected under the Wildlife Acts. It breeds in ponds and still-water ditches and shows preference for vegetated water bodies with surrounding terrestrial habitats that provide cover for foraging and hibernation. There are no suitable habitats on the site for the smooth newt and therefore does not occur.

7.5 Birds

Birds species listed in Annex I of the Birds Directive are considered a conservation priority. During the survey, all birds seen or heard within the development site were recorded. Certain bird species are listed by BirdWatch Ireland as Birds of Conservation Concern in Ireland (BOCCI). These are bird species suffering declines in population size. BirdWatch Ireland and the Royal Society for the Protection of Birds have identified and classified these species by the rate of decline into Red and Amber lists (Gilbert *et al.* 2021). Red List bird species are of high conservation concern and the Amber List species are of medium conservation. Green listed species are regularly occurring bird species whose conservation status is currently considered favourable. Birds species listed in Annex I of the Birds Directive (2009/147/EC) are considered a conservation priority. No Annex I bird species were recorded during the site survey.

The National Biodiversity Centre online data base lists 110 species of bird recorded within grid square O03, eleven of which are listed under Annex I of the Birds Directive or BOCCI Red List, as presented in **Table 6**.

Table 6. Annex I and/or Red List Bird species in Grid square O03

Species	Annex I	BOCCI (2021) – Red List
European Golden Plover (*Pluvialis apricaria*)		x
Corn Crake (*Crex crex*)	x	x
Grey Partridge (*Perdix perdix*)		x
Red Grouse (*Lagopus lagopus*)		x
Common Pochard (*Aythya ferina*)		x
Eurasian Woodcock (*Scolopax rusticola*)		x
Grey Wagtail (*Motacilla cinerea*)		x
Meadow Pipit (*Anthus pratensis*)		x
Barn Owl (*Tyto alba*)		x
Common Redshank (*Tringa totanus*)		x
Yellowhammer (*Emberiza citrinella*)		x

Source: NBDC 22/11/21

A bird survey was carried out in conjunction with habitat surveys on 21st April 2021. During the survey, all birds seen or heard within the development site were recorded and presented in

Table 7. The majority of birds utilising the proposed works areas were common in the local landscape.

Table 7. Bird Species recorded at the site in April 2021

Species	Annex I	BOCCI (2021) – Red List
Wood pigeon (*Columba palumbus*)		

The proposed development site is located within an industrial estate dominated with buildings and recolonising bare ground. A small treeline and grassy verge are located on the southern/western boundary. There is minimal foraging or nesting habitat within the site boundary.

The surrounding area includes industrial and residential developments and a school with associated playing fields. These habitats offer minimal opportunity for bird species beyond those common to urban and suburban areas and this is reflected in the common species identified on the site during the survey.

Overall, the proposed development site is of a low local value for terrestrial bird species that are relatively common in the Irish urban environment. No species of high conservation status were recorded within the proposed development site. No signs of other significant nesting species were recorded.

7.6 Invasive Species

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

Where a non-native species displays invasive qualities and is not managed it can potentially: (1) out compete native vegetation, affecting plant community structure and habitat for wildlife; (2) cause damage to infrastructure including road carriageways, footpaths, walls and foundations; and, (3) have an adverse effect on landscape quality.

Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 make it an offence to plant, disperse, allow dispersal or cause the spread of certain species e.g. Japanese knotweed and Himalayan Balsam, keep the plant in possession for purpose of sale, breeding, reproduction, propagation, distribution, introduction or release, keep anything from which the plant can be reproduced or propagated from, without a granted licence and keep any vector material for the purposes of breeding, distribution, introduction or release. The Wildlife (Amendment) Act 2000 states that anyone who plants or otherwise causes to grow in a wild state in any place in the State any species of (exotic) flora, or the flowers, roots, seeds or spores of (exotic) flora shall be guilty of an offence.

There is a statutory obligation under S.I. 477 of 2011 of the European Communities (Birds and Natural Habitats) Regulations 2011 to address invasive species in Ireland.

The NBDC lists the high impact invasive species which have been recorded within grid square O03 (**Table 8**).

Table 8. NBDC list of high impact invasive species in grid square O03

Common Name	Latin Name
American Mink	*Mustela vison*
Brown Rat	*Rattus norvegicus*
Canadian Waterweed	*Elodea canadensis*
Cherry Laurel	*Prunus laurocerasus*
Eastern Grey Squirrel	*Sciurus carolinensis*
Fallow Deer	*Dama dama*
Feral Ferret	*Mustela furo*
Giant Hogweed	*Heracleum mantegazzianum*
Harlequin Ladybird	*Harmonia axyridis*
House Mouse	*Mus musculus*
Indian Balsam	*Impatiens glandulifera*
Japanese Knotweed	*Fallopia japonica*
New Zealand Flatworm	Arthurdendyus triangulatus
Nuttall's Waterweed	*Elodea nuttallii*
	Rhododendron ponticum
Siberian Chipmunk	*Tamias sibiricus*
Sika Deer	*Cervus nippon*

Source: NBDC 19/04/21

The control of invasive species in Ireland comes under the Wildlife (Amendment) Act 2000, where it states that

'Any person who— [...] plants or otherwise causes to grow in a wild state in any place in the State any species of flora, or the flowers, roots, seeds or spores of flora, ['refers only to exotic species thereof'][...] otherwise than under and in accordance with a licence granted in that behalf by the Minister shall be guilty of an offence.'

The Birds and Natural Habitats Regulations 2011 (SI 477 of 2011), Section 49(2) prohibits the introduction and dispersal of species listed in the Third Schedule, which includes Japanese Knotweed and Himalayan Balsam, as follows: "any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow [….] shall be guilty of an offence."

No third-schedule invasive species were recorded within the proposed development site.

The Medium Impact Invasive species Buddleia (*Buddleja davidii)* was recorded on the site, at the south west corner of the building. This species is listed on the Invasive Species Ireland *"Amber List: Recorded Species"* (which under the right conditions could represent a significant impact on native species or habitats). Buddleia is also included in the *NRA Guidelines on the Management of Noxious Weeds and Non-native Species on National Roads* (NRA, 2010) as these species have been shown to have an adverse impact on landscape quality, native biodiversity or infrastructure.

7.7 Other species

A search of the NBDC database was carried out to determine if any protected, rare or notable species of invertebrates within 2km of the proposed development site (O03X).

Two threated invertebrate species have been recorded within this O03X i.e. Large Red Tailed Bumble Bee (*Bombus (Melanobombus) lapidarius*) and Moss Carder-bee (*Bombus (Thoracombus) muscorum*). However, during the habitats survey no rare or notable species of invertebrate were observed within the proposed development site.

Whilst no site is without invertebrate interest, it is considered unlikely, given the habitat types, that the proposed development site would support any protected invertebrate species. While the loss of habitat may lead to a short-term loss of invertebrate foraging habitat, the proposed planting at the site is likely to provide alternative foraging habitat for invertebrate species.

8. Water Quality

8.1 EPA Water Quality Data

The Environmental Protection Agency (EPA) carries out a biological assessment of most river channels in the country on a regular basis. The assessments are used to derive Q values, indicators of the biological quality of the water. The biological health of a watercourse provides an indication of long-term water quality. The EPA Q value scheme is summarised in **Table 9**. The relationship between the Q-rating system and the Water Framework Directive classification as defined by the Surface Waters Regulations 2009 (S.I. 272 of 2009) is shown in **Table 10**. EPA biological monitoring data for the closest freshwater monitoring sites applicable to the development site, in relation to flow direction and topography are shown in **Table 11**.

The Q Value system, which is used by the Environmental Protection Agency, describes the relationship between water quality and the macro-invertebrate community in numerical terms. The presence of pollution causes changes in flora and fauna of rivers. Well documented changes occur in the macro-invertebrate community in the presence of organic pollution: sensitive species are progressively replaced by more tolerant forms as pollution increases. Q5 waters have a high diversity of macro-invertebrates and good water quality, while Q1 have little or no macro-invertebrate diversity and unsatisfactory water quality.

The intermediate ratings Q1-2, Q2-3, Q3-4 and Q4-5 are used to denote transitional conditions, while ratings within parenthesis indicate borderline values. Great importance is attached to the EPA biotic indices, and consequently it is these data that are generally used to form the basis of water quality management plans for river catchments.

Table 9. EPA biotic index scheme

Q value	Water quality	Pollution	Condition
5	Good	Unpolluted	Satisfactory
4	Fair	Unpolluted	Satisfactory
3	Doubtful	Moderately polluted	Unsatisfactory
2	Poor	Seriously polluted	Unsatisfactory
1	Bad	Seriously polluted	Unsatisfactory

Table 10. Correlation between the WFD classification and Q values

Ecological status WFD	Q Values
High	Q5, Q4-5
Good	Q4
Moderate	Q3-4
Poor	Q3, Q2-3
Bad	Q2, Q1

The proposed development site lies within the catchment of the River Liffey and is located approximately 1km from the river, as presented in **Figure 7**. The most recent biological monitoring, conducted by the EPA in 2019, at locations upstream and downstream of the proposed development site is presented in **Table 11**. It indicate that water quality was Q3-4 (moderate) upstream and Q3 (poor) downstream of the site.

Table 11. EPA Q Values

Location	Q Values	Sampling Year
Lucan Bridge	Q3-4 (moderate)	2019
2km d/s Chapelizard bridge	Q3 (poor)	2019

Figure 7. Proposed development site in relation to relevant EPA biological monitoring sites along the River Liffey. Source EPA catchment.ie 22/04/2021

8.2 River Basin Management Plan for Ireland 2015 – 2018 (2nd Cycle)

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

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

Overall, RBMP assesses the quality of water in Ireland and presents detailed scientific characterisation of our water bodies. The characterisation process also takes into account wider water quality considerations, such as the special water-quality requirements of protected areas. The characterisation process identifies those water bodies that are *At Risk* of not meeting the objectives of the WFD, and the process also identifies the significant pressures causing this risk. Based on an assessment of risk and pressures, a programme of measures has been developed to address the identified pressures and work towards achieving the required objectives for water quality and protected areas. Data relating to the watercourses within the study area is provided in **Table 12** and the location of these shown in **Figure 8.**

Treated wastewater from the proposed development site will ultimately be discharged to the transitional waters (Liffey Estuary Lower) / coastal waters (Dublin Bay) via a primary discharge point from the Ringsend WWTP. The 2019 AER for the Ringsend WWTP notes that the discharge from the wastewater treatment plant does not have an observable negative impact on the water quality in the near field of the discharge and in the Liffey and Tolka Estuaries. However, the WFD characterisation process concluded that the Ringsend WWTP is a significant pressure on the Liffey Estuary Lower water body.

The WFD 3rd cycle results have been partially released through the EPA website. These results show that the status of Dublin Bay remains “Not at risk”.

Table 12. WFD Status

Catchment: Liffey and Dublin Bay (Code 9) – 2nd Cycle
This catchment includes the area drained by the River Liffey and by all streams entering tidal water between Sea Mount and Sorrento Point, Co. Dublin, draining a total area of 1,616km2. The largest urban centre in the catchment is Dublin City. The other main urban centres are Dun Laoghaire, Lucan, Clonee, Dunboyne, Leixlip, Maynooth, Kilcock, Celbridge, Newcastle, Rathcoole, Clane, Kill, Sallins, Johnstown, Naas, Newbridge, Athgarvan, Kilcullen and Blessington. The total population of the catchment is approximately 1,255,000. The Liffey catchment contains the largest population of any catchment in Ireland and is characterised by a sparsely populated, upland south eastern area and a densely populated, flat, low lying area over the remainder of the catchment basin. The Liffey catchment comprises 17 subcatchments with 77 river water bodies, six lakes, six transitional and five coastal water bodies, and 16 groundwater bodies **Proposed Development Site –** Sub catchment Liffey_SC_090. A predominantly urban sub-catchment as it flows through Dublin City from Lexlip, it displays some of the major issues associated with inefficient drainage systems and problems with misconnections. This is a known major issue for the respective Local Authorities and work is underway to further identify sources of these pressures. Combined sewer overflows have also been identified as

a significant pressure in Dublin City Council. This data needs to be reviewed before further work can be prioritised.			
Waterbodies relevant to the proposed project (2nd Cycle)			
Waterbody	WFD Status	Risk	**Pressure Category** **WFD Status**
LIFFEY_180	Unassigned	At risk	Urban runoff, urban wastewater
LIFFEY_190	Moderate	At risk	Urban runoff, urban wastewater
Liffey Estuary	Good	At risk	Urban wastewater
Dublin Bay	Good	Not at risk	n/a

Source: EPA envision mapping and www.catchments.ie 22/04/2021

Figure 8. WFD 2nd cycle - waterbodies in the vicinity of the proposed development | Source: EPA Envision mapping | not to scale. Red lines 'At Risk'.

9. Evaluation of Potential Impacts

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

Discharges of silt, were they to occur through inadequate control of surface water run-off. Minor spills of hydrocarbons during construction could impact on groundwater. There is no watercourse within 1km of the site.

9.1 Do Nothing' Impact

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

ground cover to scrub would be expected to occur. This succession is already occurring with the recolonised bare ground habitat present on site. If sufficient time elapsed without development, the unused areas of the proposed development area would be expected to develop a covering of woodland with a mix of native and introduced species.

9.2 Impact Appraisal

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

The *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, August 2017) provides standard definitions which have been used to classify the effects in respect of ecology. This classification scheme is outlined below in **Table 13**.

Table 13. EPA Impact Classification

Impact Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment.
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment.
Significance	Imperceptible	An effect capable of measurement but without significant consequences.
	Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging trends.
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound	An effect which obliterates sensitive characteristics.
Duration and Frequency	Momentary Effects	Effects lasting from seconds to minutes.
	Brief Effects	Effects lasting less than a day.
	Temporary Effects	Effects lasting less than a year.
	Short-term	Effects lasting one to seven years.
	Medium-term	Effects lasting seven to fifteen years.
	Long-term	Effects lasting fifteen to sixty years.
	Permanent	Effects lasting over sixty years.
	Reversible Effects	Effects that can be undone.

Impact Characteristic	Term	Description
	Frequency	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost.
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic	Where the resultant effect is of greater significance than the sum of its constituents.
	'Worst Case'	The effects arising from a development in the case where mitigation measures substantially fail.

10. Potential Impacts on Habitats

Impacts on terrestrial habitats are generally restricted to direct removal of habitats. Indirect impacts may occur via damage and disturbance arising from vehicular activities and removal of all building and substrate on the site. Levels of dust during construction are predicted to be low and effectively managed by mitigation. The impact on vegetation in adjoining habitats from wind-blown dust is predicted to be imperceptible. No rare floral species were recorded within the study area.

Based on the criteria outlined by EPA (2017), as described above, the predicted impacts are detailed in **Table 14.**

Table 14. Predicted impacts as a result of the proposed development

Habitat	Ecological value (NRA guidelines)	Potential Impact
Buildings and artificial Surfaces BL3	Local importance (Lower value)	This habitat will be removed as part of the proposed development. Negative. Not significant. Permanent impact.
Recolonising bare ground (ED3)	Local importance (Lower value)	This habitat will be removed as part of the proposed development. Negative. Not significant. Permanent impact.
Hedgerows (WL1)/Treelines (WL2)	Local importance (Higher value)	The site landscape plan indicates the treelines will be retained (See Landscape Plan **appendix 3**). Neutral. Not significant. Permanent impact.

11. Potential Impact on Fauna

11.1 Bats

The bat survey determined that the site, including the building and trees, had low bat roosting potential. The proposed development site is located within a well-lit urban setting which offers dark areas for foraging bats. Furthermore, no bat activity was recorded during the bat emergence survey. Therefore, the project will not have a significant impact on bat roosts or foraging habitat.

11.2 Other Mammals

There will be loss of common habitat types located within the development site and thus there will be some negative impacts on fauna. Some increased noise and disturbance is predicted to occur during construction and during subsequent occupancy of the residential development, however the impact on local mammal populations is predicted to be slight to imperceptible.

The buildings and manmade habitats onsite offer little value as habitat for protected mammal species. While the habitats to be directly affected may form part of the territories of various mammal species, they do not provide critical resources and direct impacts on these habitats will be localised and temporary. Whilst increased noise and disturbance is predicted to occur during construction and to a lesser degree during operation, the impact on local mammal populations is predicted to be slight in the short-term and imperceptible in the long-term. The predicted noise level will not be excessive in the context of normal domestic and road traffic levels.

11.3 Birds

The terrestrial bird species recorded within the development site during the bird survey are typical of the types of habitat noted on site and are generally common. No rare or uncommon species or species of high conservation value were recorded. There will be a net loss common habitat within the proposed development site.

The landscape plan for the development includes the retention of the trees along the western and southern boundaries as well as new tree planting within the site's interior, which will provide some additional breeding and foraging habitat.

Some displacement of feeding birds may occur during construction due to increased noise and disturbance. Disturbance can cause sensitive species to deviate from their normal, preferred behaviour, resulting in stress, increased energy expenditure and, in some cases, species mortality. The impact is therefore predicted to be a short-term, not significant impact.

It is noted that the proposed development site is located within an existing industrial/suburban area, which is already subject to some noise disturbance and light pollution from neighbouring premises. During the construction stage, there will be short-term increases in disturbance. Whilst works could potentially disrupt feeding patterns, given the limited value of habitats on-site, the availability of more valuable habitat in the surrounding area and the ability of birds to move away from disturbance, the impact on the feeding behaviour of these species is predicted to be imperceptible.

During the operational phase, the levels of activity will stabilise and birds in the surrounding landscape will be expected to habituate to any increased noise and disturbance levels. The impact on terrestrial birds, in habitats adjoining the proposed development site is therefore predicted to be permanent and not significant during operation.

11.4 Other Fauna

No signs of amphibians or reptiles were recorded. The proposed development area is only likely to support common invertebrate species. Given that the habitats which will be affected are relatively common in the surrounding landscape, any impact on these species will be slight to not significant.

12. Potential impact on water quality

12.1 Impacts on water quality during the construction phase

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

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

Inadvertent spillages of hydrocarbons during construction could introduce toxic chemicals into the aquatic environment via surface water run-off or groundwater contamination and have a direct toxicological impact on habitats and fauna. During construction there may be an increased probability of silt discharging from the proposed development site. In the absence of appropriate design and mitigation, high levels of silt in surface water run-off could theoretically arise. However, as part of the proposed construction process a number of mitigation measures have been specified (refer to **Section 14**). These measures will ensure that there are no significant impacts on surface water quality or downstream aquatic receptors during the construction phase.

It is noted that the proposed development site is located 1km from the nearest watercourse and there will be no direct discharge into surface water receptors.

12.2 Impacts on water quality from discharges of wastewater and surface water during operation.

Once constructed surface and wastewater from the proposed development will be conveyed for treatment to Ringsend WWTP, which is located approximately 11.5km east of the proposed development site.

The Ringsend WWTP treatment process includes the following;

- Preliminary treatment (including screening / grit removal)
- Primary treatment
- Secondary treatment - SBR and Nereda Pilot Plant
- Sludge treatment
- Tertiary treatment – UV treatment (during the bathing season)

According to the Annual Environmental Report for 2020 (Irish Water 2021) the Ringsend WWTP was non-compliant with the ELV's set in the wastewater discharge licence. There were 69 samples non-compliant with the ELV in relation to cBOD. The non-compliance is due to overloading. There were 52 samples non-compliant with the ELV in relation to COD. The non-compliance is due to overloading. There were 146 samples non-compliant with the ELV in relation to TSS. The non-compliance is due to overloading. There were 97 samples non-compliant with the ELV for TP. The non-compliance was due to no P removal treatment on site. There were 94 samples non-compliant with the ELV for TN. The non-compliance was due to overloading. The WWTP effluent was compliant with the pH and Toxicity ELVs set in the wastewater discharge licence. The WWTP was non- compliant with the ELV set in the wastewater discharge licence for Faecal Coliforms (E. Coli) monitored during the specified period 01/05/20 to 31/08/20 (4 breaches). Two breaches of the Condition 2 ELV occurred on the 27/07/2020 (198,630 MPN/100ml) and the 17/08/2020 (241,960 MPN/100 ml).

The AER 2020 notes the following regarding the ssignificance of these results:

- The Ringsend WWTP was non-compliant with the ELV's set in the wastewater discharge licence (as described above).
- The primary discharge from the wastewater treatment plant does have an observable negative impact on the water quality in the near field of the discharge and in the Liffey and Tolka Estuaries
- The primary discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status in the Liffey Estuary. The DIN limit for Dublin Bay has been exceeded on occasion at 4 locations in 2020.
- Other potential causes of deterioration in water quality relevant to this area are upstream riverine pollutants, combined sewer overflows, exfiltration from sewers and misconnections to surface water sewers in the large urban agglomeration.

Any existing or proposed projects discharging to the plant have the potential to act cumulatively to reduce water quality in Dublin Bay, affecting European sites therein. Despite Ringsend WWTP historically operating above capacity, no significant effects from discharge arising from the proposed development are predicted due to the following:

- There was no proven link between WWTP discharges and nutrient enrichment of sediments in Dublin Bay based on analyses of dissolved and particulate Nitrogen signatures (Wilson and Jackson, 2011);

- Enriched water entering Dublin Bay has been shown to rapidly mix and become diluted such that the plume is often indistinguishable from the rest of bay water (O'Higgins and Wilson, 2005); and

- Marine modelling for Ringsend WWTP indicates that discharged effluent is rapidly mixed and dispersed to low levels via tidal mixing within a short distance of the outfall pipe (Dowly & Bedri 2007).

- Irish Water is continuing to progress with the delivery of the Ringsend Capacity Upgrade. It is anticipated that commissioning of the Capacity Upgrade will be fully operational by the end of 2020. An Bord Pleanála granted planning permission for the project on 24th April 2019, consenting for the works required to facilitate the use of the AGS technology in the existing treatment tanks and to omit construction of the Long Sea Outfall tunnel. The Upgrade works are expected to take until 2025 to complete. However, the proposed upgrade is currently programmed to start producing an effluent in line with the parameters set out in the UWWTD by end of 2022. It is important to note that this programmed 2022 date is the anticipated date that the plant can start producing an effluent in line with the parameters set out in the UWWTD and the actual confirmed UWWTD compliance determination will be up to 12 months from that date (on attaining 12 months compliance with the UWWTD ELVs).

- In the future, it is intended that wastewater from the Greater Dublin area will be treated at the extended Ringsend Plant as well as at a new plant being planned in North County Dublin.

- Therefore, it is concluded that there will be no likelihood for significant effects on any European sites, and there will be no adverse effects on European site integrity during the construction or operation of the proposed development in combination with other plans or projects, based on the fact that;

- The coastal waters in Dublin Bay are classed as “Good/Not at Risk” status (WFD);

- It is an objective of all development plans within the catchment of Ringsend WWTP to include Sustainable Urban Drainage Systems for all new development;

- It is extremely unlikely that during construction a pollution event would occur of a magnitude that would have an adverse effect on water quality within Dublin Bay;

- There was no proven link between WWTP discharges and nutrient enrichment of sediments in Dublin Bay based on analyses of dissolved and particulate Nitrogen signatures (Wilson and Jackson, 2011); and

- Enriched water entering Dublin bay has been shown to rapidly mix and become diluted such that the plume is often indistinguishable from the rest of the bay water (O'Higgins and Wilson, 2005).

Based on the above no effect on water quality or on the qualifying interests and conservation objectives for Natura 2000 sites will occur by the planned development at Cherry Orchard.

13. Cumulative Impacts

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

Cumulative impacts on fauna chiefly relate to increased noise and activity levels. Cumulative impacts from noise/disturbance are likely to be most pronounced during construction. This is a short-term impact which will be localised. During operation, only a slight localised increase in traffic and noise is predicted. There are no watercourses in proximity to the site and no impact on water quality is predicted to occur.

The works will take place in the context of an industrial/urban area with relatively high levels of background noise to which fauna to a degree will be habituated. In this context no significant cumulative noise and disturbance impacts are predicted. As this proposed development is not predicted to significantly increase long term noise and disturbance levels or impact on water quality, no significant cumulative impacts have been identified. The habitats within the proposed development site, notwithstanding their location within an urban setting, are of low value and no significant cumulative effect from the loss of habitat will occur.

14. Mitigation Measures

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

14.1 Construction Phase Mitigation Measures

Construction best practice measures (of relevance in respect of any potential ecological impacts) will be implemented throughout the project, including the preparation and implementation of detailed method statements. The works will incorporate the relevant elements of the guidelines outlined below:

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

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

A detailed Construction and Environmental Management Plan (CEMP) will be developed by the appointed Contractor. This CEMP will comprise all of the construction mitigation measures which are set out in this report. It is noted that an Outline Waste and Construction Management Plan has been submitted with this planning application. The principal measures which will be set out in the CEMP are summarised below:

14.2 Protection of Habitats & Species

Working hours intended will be 8.00-20.00 Monday to Friday and 8.00-14.00 Saturdays. These working hours will be agreed as per planning. Working will not be permitted on Bank Holidays or Sundays unless agreed with the Employer's representative. This will minimise disturbance to any roosting birds or feeding nocturnal mammal species.

To prevent incidental damage by machinery or by the deposition of spoil during the site clearance stage, any trees earmarked for retention will be clearly marked in a manner visible to machinery operators. Trees that are to be retained which are located in close proximity to working areas will be clearly marked and fenced off to avoid accidental damage during excavations and site preparation.

Where possible demolition of buildings and stripping of surface material will take place during dry weather. This reduces the potential for elevated silt levels in surface water run-off. The Outline Waste and Construction Management Plan provides requirements for managing dust during the construction phase. This includes ensuring that adequate provision is made to damp down areas where activities are likely to create dust. Measures shall include spraying by pressure hoses to suppress dust and provision of bowers and suction road sweepers where appropriate.

The bat survey indicated that the site does not contain bat roosts or part of bat foraging commuting routes. However, school grounds to the north of the proposed development site is a dark area and has treelines with potential suitability for bat foraging activity. Therefore the

focus of mitigation in relation to bats is to minimise artificial lighting off the site into the school grounds. The following is advise:

- Avoid permanent lighting overspill off the site along the northern site boundary (close to the school boundary).
- External lighting should be kept to a minimum during construction and operation and where possible will follow the Bat Conservation Ireland Lighting Guidelines and the Bat Conservation Trust 'Bats and artificial lighting in the UK' 2018 Guidelines, if applicable.
- The lighting should be directionally focused, onto roads and pedestrian areas to provide a safe means of traversing the estate, with no spillage of light to adjoining habitats. To reduce light spillage from luminaries, lights that are designed not to emit light at angles greater than 70˚ from the vertical plane should be used. Other designs to luminaires to help reduce light spillage and to direct light to the intended area only are by using accessories such as hoods, cowls, louvres and shields.
- No white light should be used along peripheral habitats, as this has the greatest impact on bats. Low pressure sodium lights have a minimum impact on bats. Lighting that has little or no UV content have the least impact on bats.

Although no suitable trees were identified within the site boundary, in the unlikely event that bats are to be recorded roosting within the proposed works site then work would be halted and specific mitigation measures would be implemented including where relevant seasonal restrictions and provision of replacement roosting habitat. The ecologist will also be required to obtain a derogation license from the NPWS, to facilitate licensed exclusion of the roosting site in accordance with a plan approved by the NPWS.

14.3 Protection of Water Quality

The employment of good construction management practices will minimise the risk of pollution of soil, storm water run-off or groundwater. The Construction Industry Research and Information Association (CIRIA) in the UK has issued a guidance note on the control and management of water pollution from construction sites, *Control of Water Pollution from Construction Sites, guidance for consultants and contractors* (Masters-Williams *et al*., 2001).

Surface water pollution from construction sites to natural habitats and species can result in potential adverse impacts occurring outside of the site and at some distances from the site. The contractor shall include details for managing surface water run-off from site during the construction works and details of same shall be included as part of their construction management plan.

The contractor should consider sources of water as follows;

- Rainwater – this being the main source of surface water on site. The contractor shall ensure that rainfall levels are considered and strategy for same implemented. Material storage and works on site.
-]Surface water – the construction site is not adjacent to nor do any watercourses pass through the site.

- Groundwater – the site investigation will provide details of potential groundwater and recommendations for dealing with same will be implemented. Should there be a high water table sump/pump system will be implemented during construction works to allow foundations and excavations be completed in a safe manner and to ensure no flooding occurs. Outlet locations for the system will be agreed with South Dublin County Council.

- The contractor should consider sources of potential water pollutions as follows;

- Suspended solids – the potential for solid pollution from works on site should be considered by the contractor. Sources of such pollution include excavation, earth stockpiles, plant and wheel washing, buildup of mud on roads. All the necessary procedures should be followed to ensure suspended solids do no enter surface water systems.

- Oils and hydrocarbons – such materials are a source of pollutants on site. All necessary procedures to be implemented. These include but are not limited to; storage of oils and diesel in designated spaces, leaking drum removed from site immediately, refueling of machinery to take place in designated areas, double bunded fuel bowsers to be used, care taken when preparing formwork, spillage of fuels immediately contained.

- Use of concrete and cement based products – all necessary storage facilities will be provided for such materials to minimize run-off and dust pollution from same. Where insitu concrete is to be used control measures regarding mixing and pouring to be implemented to ensure run-off and pollutant from same are eliminated. Consideration to be given to precast concrete where appropriate.

Methods for managing surface water runoff from the site during construction works will be required. They shall be required to implement surface water management measures to prevent the release of contaminates water back into the environment and minimize uncontrolled run-oof of potential contaminated surface waters by reducing extents of ground disturbance / excavated material. Agreement where necessary with South Dublin County Councils Environmental and Drainage departments will be sought. Best practice standards and environmental guidelines will form the basis for their methods and should be followed during construction works. The contractor shall comply with the requirements as set out in the Public Health Act. All surface water discharges must be in compliance with the European Communities (surface water) Regulations and the European Communities (groundwater) regulations.

14.4 Air Quality

The Contractor shall implement a dust management plan for the duration of the project. They should comply with and consider the recommendations from Control of Dust from Construction and Demolition Activities document (BRE/DTI 2003). The dust management plan will be reviewed and adhered to throughout and where dust limits are exceeded, the construction operations reviewed. They will ensure that adequate provision is made to damp down areas where activities are likely to create dust. Measures shall include spraying by pressure hoses to suppress dust and provision of bowers and suction road sweepers where appropriate.

Plant shall be sited and screened where necessary to minimise dust emissions.

All stockpiles of demolition or excavations shall be covered to prevent generation of dust. The Contractor shall take all necessary measures to prevent spillage onto public roads. The Contractor shall provide a wheel washing equipment or other methods as approved by the Employer's Representative for all plant leaving the site area. Where mud or site material is carried out on to the public pavement the Contractor shall take all necessary steps to ensure the roads are cleaned immediately.

The Contractor shall clean the public gullies in the vicinity of the site before the works commence and at regular intervals during the works to ensure there is no blockages.

The Contractor shall also undertake to replace any road markings in the vicinity of the site as and when the need arises.

14.5 Invasive species

14.5.1 Buddleia

As Buddleia is a plant that favours disturbed sites, physical grubbing of plants can provide ideal conditions for the germination of seeds. Care needs to be taken to ensure revegetation of controlled areas is undertaken swiftly. The branches of buddleia are capable of rooting as cuttings, so care should also be taken to ensure material is disposed of in a manner to avoid this risk. Because stem and root fragments readily regenerate, debris piles should be burned, composted or otherwise treated in such a way to kill all seeds, stems and root fragments.

Care must be taken when treating plants that are emerging from existing masonry and structures.

A number of different methodologies employed to treat Buddleia are summarised below (**Table 15** summarises the physical and chemical control measures for Buddleia as recommended by the National Roads Authority). These include the following:

Physical/mechanical control

Physical removal on a small spatial scale may help in the early stages of invasion. Young shrubs can be dug up, but this method is not recommended for mature plants. Hand-picking of young plants is feasible.

During the physical removal of the species care should be taken to avoid soil disturbance which can give rise to a flush of new seedling. Grubbing of mature stands as a sole attempt at control is not recommended for the same reason. After uprooting, it is essential to plant the ground in order to prevent a flush of new seedling growth. Remaining stumps should be treated with an herbicide.

Movement control

Dead-heading is the recommended method to reduce the spread of the species by seed. In particular, where the removal of mature plants is not feasible in the short term, the flower heads should be cut off in June before seed set.

Chemical control

Recommended practice for the application of herbicides requires cutting back of plants to a basal stump during active growth (late spring to early summer) which is then treated (brushed on) immediately with a systemic weed killer mix (Starr *et al,* 2003). Foliar application of triclopyr or glyphosate may be adequate for limited infestations of younger plants but should be followed up at 6 monthly intervals. Direct and precise application, such as painting cut stumps or inject/plug herbicide into the plant is more effective than spraying (Ream, 2006; Zazirska and Altland, 2006).

Table 15. Summary of Physical and Chemical Control Measures for Buddleia

Physical Control		
Method	**Season**	**Follow-up**
Grubbing	Any time of year when the soil is suitably dry. Small plants can be pulled by hand. Large stems cut and roots grubbed out.	Regular follow-up to deal with re-growth or seedlings which can result from exposure of soil.
Chemical Control		
Method	**Season**	**Follow-up**
Systemic weed-killer mix (Starr *et al.* 2003)	During active growth in late spring or summer.	Brushed on to cut back stumps.
Triclopyr or Glyphosate	During active growth in summer of limited infestations of young plants	Foliar spray. Requires follow-up at 6 monthly intervals.
All Plant Protection Products should be used in accordance with the product label and with Good Plant Protection Practice as prescribed in the European Communities (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003). It is an offence to use Plant Protection Products in a manner other than that specified on the label. Source: (NRA 2010, *Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads*)		

14.5.2 High Impact Invasive Species

No High Impact invasive species were encountered on the site. However, to prevent the inadvertent introduction of invasive species to the site, certain precautionary measures are required.

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

The supplier of fill will be required to provide a guarantee that the fill to be imported does not contain knotweed. In addition, the fill will be inspected for signs of knotweed, prior to importation to site. The UK Environmental Agency's publication *Managing Japanese knotweed on development sites - The Knotweed Code of Practice* (EA 2013), states that

inspection of topsoil brought into the site, should be carried out using the guidance in appendix I-IV of the code BS 3882:2007 '*The British Standard Specification for topsoil and requirements for use*'. This Standard was replaced subsequently by BS3882:2015 *Specification for Topsoil.* The inspection of fill will be carried out according to this Standard.

14.6 Noise

It is not envisaged that issues associated with noise and vibration will be encountered but industry recognised controls will be instigated.

All other construction activities on the site will be carried out to the allowed noise thresholds and during the operating hours specified on the planning permission.

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by onsite operations.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract.
- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machinery that is used intermittently will be shut down or throttled back to a minimum during the periods when not in use.
- The contractor will be required to carry out vibration monitoring at selected locations throughout the construction period. Works will be required to comply with BS5228 (2009). Thresholds for vibration limits based on the surrounding area usage will be set and a management plan for dealing with situation where vibration limits are exceed should be agreed and form part of the construction management plan.

14.7 Waste Management

The Main Contractor shall ensure that all storage of materials, equipment and substances conform to all relevant statutory requirements including any relevant standards, codes etc. Access to storage facilities should be restricted and the facilities located as not to pose a risk to adjacent properties, or any person utilising them or their amenities. Attention is also drawn to the risks associated with the storage of any flammable or explosive liquid or gas and the statutory requirements pertaining to such storage.

It should be noted that all materials must be stored either within the confines of the works themselves, or within the site compound. The Project Supervisor Construction Stage will need to include in the Safety and Health Plan the arrangements and procedures for storage, and disposal, to ensure compliance with statutory provisions and to protect adjoining properties and personnel. Loading and unloading should generally take place within the contractor's site compound.

All waste arising from the construction will be managed and disposed of in accordance with all current legal and industrial standards including

- Waste Management Act 1996 as amended and associated Regulations.
- Litter act 1997
- Packaging regulations 2003
- Waste Management Plan for the Dublin Region 2005 -2010

The following publications are to be referenced during the construction of the works for the disposal of waste:

- Best Practice Guidance on the preparation of waste management plans for construction and demolition projects.
- Construction and Demolition Waste Management handbook.

General construction waste which can be recycled such as timber, plastic and metals will be segregated on site and collected by an approved collection contractor. There will be a general skip for C & D waste not suitable for recycling. This skip will include wet waste including food waste, contaminated cardboard. No burning of waste will be permitted on site.

It is proposed to complete a site investigation on site including environmental testing to confirm the material nature i.e., inert, non-hazardous or hazardous. The disposal suite results for Landfill acceptability testing (WAC) will dictate the waste facility to which existing ground material being removed off site can be brought.

An asbestos survey of the warehouse to be demolished was undertaken by Asbestos Safe. Some asbestos containing material was found on the roof and their report notes this should be removed by a competent asbestos contractor. Given the hazardous nature of such material it should be disposed of correctly to a licences waste facility and all standard procedures for same should be followed.

The Contractor will be required to provide records waste management procedures on site and of all waste disposed from the site. These records will contain information on haulage contractor, location of disposal of the material, quantity of material disposed, licences for the reception facility and licences for the haulage contractor.

15. Conclusions

Overall the development will impact on low value habitats. There will be a net gain by planting of grass areas, flowerbeds and treelines.

With the exception of localised and short-term disturbance impacts during construction, no significant impacts on fauna, including birds, are envisaged. No buildings or trees suitable as bat roosting habitat were identified within the site. No watercourses are located within the site boundary and no impact on aquatic habitats in the vicinity of the site is predicted.

Given that no significant impacts on surface water quality or downstream aquatic receptors have been identified, there will be no adverse impact on designated sites (Natura 2000 sites and/or pNHAs) or their conservation objectives will occur.

Management of the medium impact Buddleia plant is required to ensure it is contained and does not spread further in the site or in the local area.

No particular difficulties in the effective implementation of the prescribed mitigation measures have been identified.

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Appendices

Appendix 1 - NRA 2009 Guidelines

Table 1: Examples of valuation at different geographical scales

Ecological valuation: Examples

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

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

County Importance:
• Area of Special Amenity.[9]
• Area subject to a Tree Preservation Order.
• Area of High Amenity, or equivalent, designated under the County Development Plan.
• Resident or regularly occurring populations (assessed to be important at the County level)[10] of the following:
  ○ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  ○ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;

- Species protected under the Wildlife Acts; and/or
- Species listed on the relevant Red Data list.

- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, 11 if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):

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

Local Importance (lower value):

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

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

Appendix 2 – Irish Water Correspondence

Louise Mahony

The Glass House
11 Coke Lane
Smithfield
Dublin 7
Co. Dublin
D07 WNP2

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

7 January 2021

Re: CDS20002792 pre-connection enquiry - Subject to contract | Contract denied

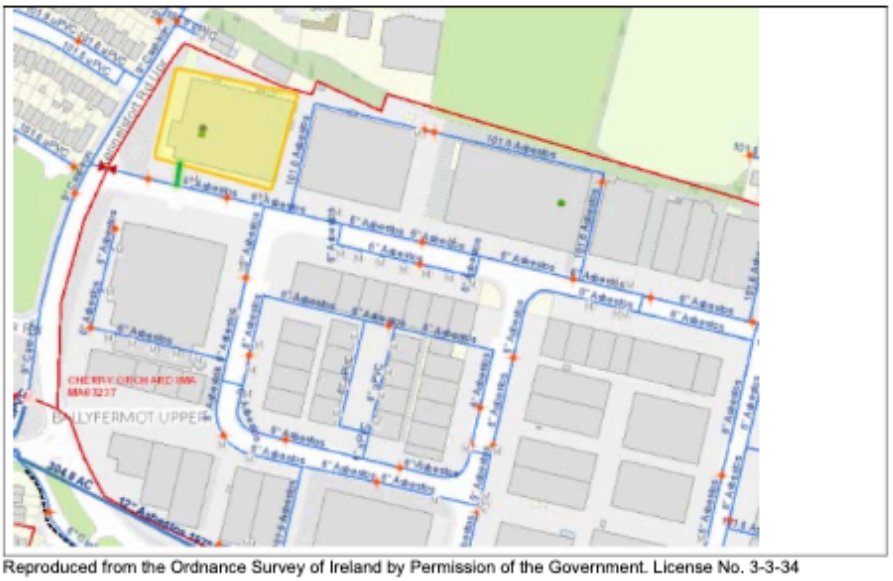
Connection for Housing Development of 148 unit(s) at Units 64 & 65, Cherry Orchard Industrial Estate, Co. Dublin

Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Units 64 & 65, Cherry Orchard Industrial Estate, Co. Dublin (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	OUTCOME OF PRE-CONNECTION ENQUIRY THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.
Water Connection	Feasible Subject to connection to the existing 6" main
Wastewater Connection	Feasible without infrastructure upgrade by Irish Water
SITE SPECIFIC COMMENTS	
Water Connection	Feasible Subject to connection to the existing 6" main
Wastewater Connection	Feasible without infrastructure upgrade by Irish Water
The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.	

The map included below outlines the current Irish Water infrastructure adjacent to your site:



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Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

General Notes:

1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at https://www.water.ie/connections/get-connected/
5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.

6) Irish Water Connection Policy/ Charges can be found at https://www.water.ie/connections/information/connection-charges/
7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
9) To access Irish Water Maps email datarequests@water.ie
10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Paul Lowry from the design team on 018230377 or email paullowr@water.ie For further information, visit **www.water.ie/connections.**

Yours sincerely,

Yvonne Harris

Yvonne Harris

Head of Customer Operations

Appendix 3. Landscape drawings


KENNELSFORT RD UPPER
CHERRY ORCHARD ESTATE RD
Existing cycle lane on Kennelsfort Road
Existing footpath on Kennelsfort Road
Existing grass verge beside the development boundary
Proposed lawn beneath proposed new trees to tie into existing grass verge on Kennelsfort Road
Proposed planter with new trees, lawn and bollard lighting
Proposed trees underplanted with native shrubs and groundcover mixture in Bio-Retention Planting
Proposed wide planter with existing Acer platanoides trees and new trees.
Proposed new evergreen hedge and new trees to northwest corner.
Proposed new turning area for refuse vehicles and fire tender
Retain existing palisade fence and proposed new evergreen hedge along the northern boundary.
Proposed new porous asphalt road to provide access to the proposed carpark, and future REDEN lands development.
Proposed new evergreen hedge and new native Irish trees to existing boundary fence
Access to Car Park
Car Park FFL 52.50
Retain existing palisade fence and plant new evergreen hedge along the eastern boundary.
Proposed new porous asphalt road provides access to carpark, fire tender and refuse trucks. The proposed road also provides future access to development properties lying east of the site.
Paved area in front of proposed work units
Proposed new evergreen hedge to existing boundary fence
New access road to carpark and future access road to adjacent properties
Proposed new cycle lane on Cherry Orchard Industrial Estate
Realt of junction between Cherry Orchard Estate Road and Kennelsfort Road3 to be reduced in line with DMURS guidelines.
Proposed new cycle lane to tie into existing cycle lane on Kennelsfort Road
Proposed new trees to supplement existing Alder trees on the southern boundary
Retain existing Alnus cordata trees Refer to Tree Survey
Remove dead tree. Refer to Tree Survey
Proposed new DOCAR parking
ENHANCED STREETSCAPE
Cherry Orchard Estate Road enhanced with new cycle lane and paved footpaths animated with active uses including resident's amenities, gym, lounge and meeting rooms.
The focus is on creating a much greener and improved pedestrian experience by introducing significant new planting and trees.
Sample image of urban plaza seating with timber benches and mixed trees
Sample image of plaza and terraced seating proposed
Sample image of proposed trees and planters to separate footpath and cycle lane from the street
Sample image of urban plaza seating
NOTES / LEGEND
Revision Date Description By
P.0 18.11.21 Issued for SHD Planning Application IR
Drawing Status
planning application
ilsa rutgers landscape architecture
ARCHITECTURAL DESIGN LANDSCAPE DESIGN
Project ORCHARD GATE SHD, Palmerstown
Drawing LANDSCAPE DESIGN - STREET / CARPARK LEVEL PLAN
Date November 2021 Drawn by IR Scale 1:250@A1 / 1:500@A3
Client AAI Palmerstown Ltd. Job No. 210401 Dwg No. 2000 Rev. P.0


KENNELSFORT RD UPPER
CHERRY ORCHARD ESTATE RD
podium FFL 52.50
NOTES / LEGEND
Revision
Date
Description
By
P.0
18.11.21
Issued for SHD Planning Application
IR
ilsa rutgers landscape architecture
ARCHITECTURAL DESIGN
LANDSCAPE DESIGN
Drawing Status:
planning application
Telephone: +353 85 7378900
e-mail: ilsa@ilsarutgers.com
Project: ORCHARD GATE SHD, Palmerstown
Drawing: LANDSCAPE DESIGN - PODIUM LEVEL PLAN
Date: November 2021
Drawn by: IR
Scale: 1:250@A1 / 1:500@A3
Client: AAI Palmerstown Ltd.
Job No. 210401
Drg No. 2100
Rev. P.0


Proposed wide planter with existing Acer platanoides trees.
Proposed new Portuguese Laurel hedge to screen existing palisade fence
Existing grass verge outside the development boundary
Proposed lawn beneath proposed new trees to tie into existing grass verge on Kennelsfort Road.
Proposed planter with new Birch and Hornbeam trees.
KENNELSFORT RD UPPER
CHERRY ORCHARD ESTATE RD
Proposed new Portuguese Laurel hedge fit screen existing palisade fence
Retain existing Alnus cordata trees Refer to Tree Survey
Remove dead tree. Refer to Tree Survey
Symbol
Species and size
Existing Trees to be protected during construction if within the hoarded site. Refer to Arboriculturist's Report
NOTE: Retained trees to be protected in strict accordance with BS 5837 (2012)
Existing Tree to be removed as part of proposed works associated with this development. Refer to Aboriculturists Report.
Seeded or turf lawn
Symbol
Species and size
Street Quantity
Podium Quantity
Quercus palustris Pin Oak 20-22 cm girth, 2m clear stem, 4-5m tall, rootball
5
5
Acer campestre Field Maple 18-20 cm girth, 2m clear stem, 4-5m tall, rootball
8
0
Betula pendula or ermanii Silver Birch 16-18 cm girth, multi stem, 4-5 m tall, rootball
28
11
Carpinus betulus Hornbeam 18-20 cm girth, 2m clear stem, 4-5m tall, rootball
17
9
Amelanchier lamarck Snowy Mespil 12-14 cm girth, multistemed, rootball, 2.5-3m tall
0
12
PLANTERS - Ornamental grasses & Seasonal interest
Stipa tenuissima, Helenium 'Moerheim Beauty' Verbena bonariensis, Buxus, Crocosmia 'Emily McKenzie'
PLANTERS - Evergreen with some Seasonal interest
Buxus, Privet, Hebe pinguifolia 'sutherlandii', Astrantia 'Buckland', Hydrangea, Hakonechloa macra
EVERGREEN HEDGING
Portuguese Laurel for medium height
Buxus sempervirens for low height
Carpinus betulus (Hornbeam)
Betula pendula with under storey of grasses
Acer campestre (Field Maple)
Quercus palustris (Pin Oak)
Portuguese Laurel hedge proposed along the north and eastern boundaries to screen existing palisade fencing.
Amelanchier lamarckii proposed in clusters in large planter on the podium.
ilsa rutgers landscape architecture
ARCHITECTURAL DESIGN
LANDSCAPE DESIGN
NOTES / LEGEND
Revision
Date
Description
By
P.0
18.11.21
Issued for SHD Planning Application
IR
Drawing Status
planning application
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Project
ORCHARD GATE SHD, Palmerstown
Drawing
LANDSCAPE DESIGN - PRIMARY PLANTING PLAN
Date
November 2021
Drawn by
IR
Scale
1:250@A1 / 1:500@A3
Client
AVI Palmerstown Ltd.
Job No
210401
Dwg No
3000
Rev.
P1