July 2021

IE DUBZZ STE1-EO MOR-RP-V-87001

Ecological Impact Assessment

INXN DUB15/16

On behalf of
Digital Netherlands VII B.V.

Profile Park, Nangor Road, Clondalkin, Dublin 22

MALONE O'REGAN ENVIRONMENTAL

QUALITY
IS EN ISO 9001:2015
NSAI Certified

MALONE O'REGAN

Form ES - 04

MALONE O'REGAN ENVIRONMENTAL

Ground Floor – Unit 3
Bracken Business Park
Bracken Road, Sandyford
Dublin 18, D18 V32Y
Tel: +353- 1- 567 76 55
Email: enviro@mores.ie

Title: Ecological Impact Assessment, INXN DUB15/16, Digital Netherlands VII B.V. Profile Park, Nangor Road, Clondalkin, Dublin 22

Job Number: E1794

Prepared By: Catherine Blake **Signed:** Catherine Blake

Checked By: Sarah de Courcy **Signed:** _____

Approved By: Dyfrig Hubble **Signed:** _____

Revision Record

Issue No.	Date	Description	Remark	Prepared	Checked	Approved
01	28/07/'21	EcIA Report	FINAL	CB	SDC	DH

Ecological Impact Assessment
INXN DUB15/16
Digital Netherlands VII B.V.
Profile Park, Nangor Road, Clondalkin, Dublin 22

Contents

FIGURES

TABLES

APPENDICES

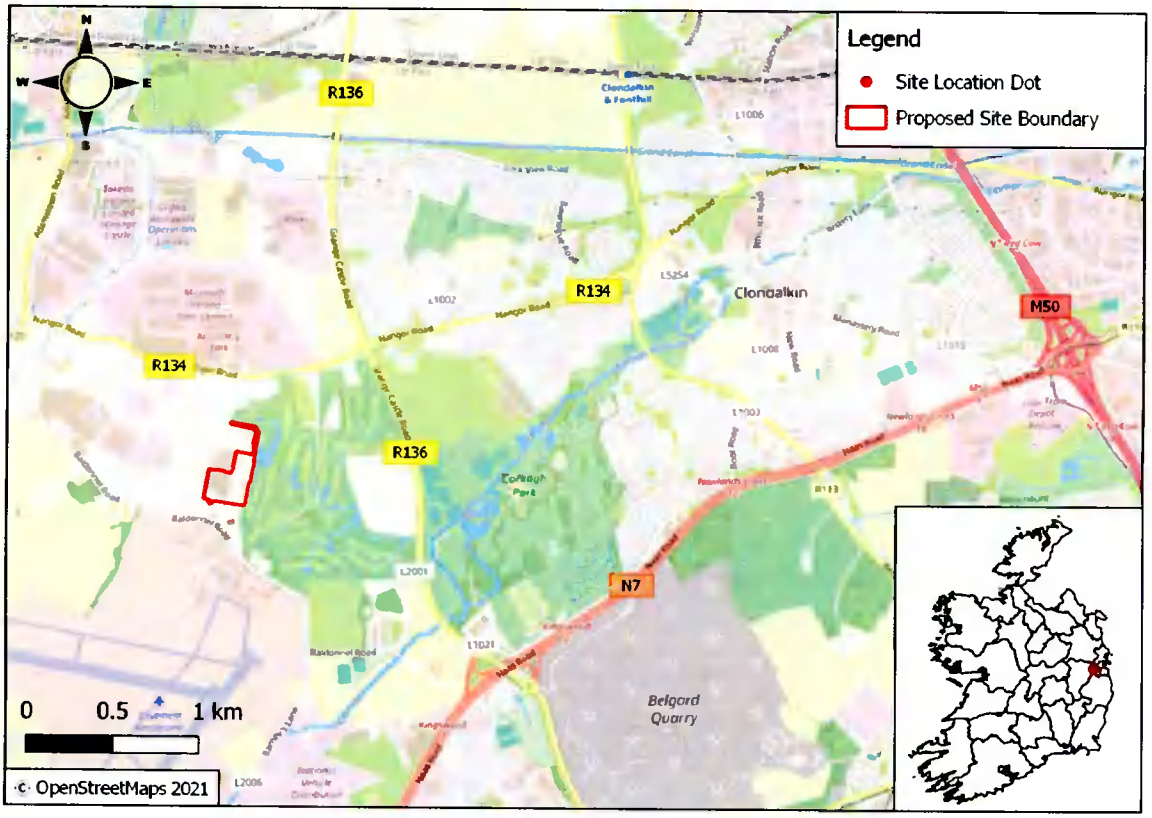
1 INTRODUCTION

1.1 Background and Purpose of Report

Malone O' Regan Environmental Services (MOR) was commissioned by RKD Architects Ltd. on behalf of Digital Netherlands VIII B.V. ('the Applicant') to undertake an Ecological Impact Assessment (EcIA) for the construction of two (2No.) data centres, an energy centre and all ancillary works at DUB 15 / 16 (Proposed Development), at Profile Park, Nangor Road, Clondalkin, Dublin 22, Co. Dublin (OS Reference O 03785 30338).

The location of the proposed development ('the Site') is shown in Figure 1-1.

Figure 1-1: Site Location



1.2 Statement of Authority

The report was approved by Mr. Dyfrig Hubble, Principal Ecologist. Dyfrig is a full member of the Chartered Institute of Ecology and Environmental Management. Dyfrig has over 15 years' experience working in the ecological consultancy sector, including habitat appraisals and specialist species-specific surveys.

1.3 Legislation and Planning Policy Context

1.3.1 Legislation Policy Context

Within Ireland, a number of sites of international or national importance to nature conservation, as well as many species of animal and plants are afforded a degree of legal protection, as set out in Box 1 below.

A study of biodiversity related planning policy at both national and local level has been undertaken for the Site and locality in order to highlight any potential conflicts with the relevant legislation and guidance documents.

Box 1 Designated Wildlife Sites and Protected and Otherwise Notable Habitats and Species

The National Parks and Wildlife Service (NPWS) notifies sites in Ireland that are of international or national importance for nature conservation (although some sites that are of national importance for certain species have not been so designated).

Internationally important sites may also be designated as:

- Special Areas of Conservation (SACs): the legal requirements relating to the designation and management of SACs in Ireland are set out in the European Communities (Natural Habitats) Regulations 1997 (as amended) (Habs Regs);
- Special Protection Areas (SPAs): strictly protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (79/409/EEC), also known as the Birds Directive; and,
- Ramsar sites: wetlands of international importance designated under the Ramsar Convention. to which Ireland is a signatory.

Other statutory site designations relating to nature conservation are:

- National Heritage Areas (NHAs): these represent examples of some of the most important natural and semi-natural terrestrial and coastal habitats in the country and are afforded protection under the Wildlife (Amendment) Act 2000. NHAs are legally protected from damage and receive protection from the date they are formally proposed for designation; and,
- Proposed Natural Heritage Areas (pNHAs): these sites are afforded the same protection as NHAs under the Wildlife (Amendment) Act 2000 from the date that they are formally proposed for designation.

Legally protected species

Many species of animal and plant receive some degree of legal protection. For the purposes of this study, legal protection refers to:

- Species included in the Wildlife (Amendment) Act 2000, excluding species that are only protected in relation to their sale, reflecting the fact that the site disposal will not include any proposals relating to the sale of species; and,
- Species afforded protection under the Flora Protection Order 1999.

Other notable habitat/species categories

- Biodiversity Action Plan (BAP) species: those targeted in local or national BAPs as being of particular conservation concern (priority species);
- Red and Amber List birds: those listed as being of high or medium conservation concern as listed by Birdwatch Ireland (Cummins, 2013); and,
- Other Irish Red Data Book species and Nationally/Regionally/Locally Notable species where appropriate.

1.3.2 National Planning Context

1.3.2.1 Project Ireland 2040, National Planning Framework

Project Ireland 2040 was launched by the Government in February 2018 (Government of Ireland, 2018). Project Ireland 2040 incorporates two policy documents i.e., National Planning Framework and the National Development Plan to 2027.

Under the biodiversity section "Project Ireland 2040 National Planning Framework" (Government of Ireland, 2018), National Policy Objective 59 states:

- *"Enhance the conservation status and improve the management of protected areas and protected species by:*
- *Implementing relevant EU Directives to protect Ireland's environment and wildlife;*
- *Integrating policies and objectives for the protection and restoration of biodiversity in statutory development plans;*
- *Developing and utilising licensing and consent systems to facilitate sustainable activities within Natura 2000 sites; and,*
- *Continued research, survey programmes and monitoring of habitats and species."*

National Policy Objective 60 in the same document states is to *"Conserve and enhance the rich qualities of natural and cultural heritage of Ireland in a manner appropriate to their significance."*

1.3.3 Local Planning Context

1.3.3.1 South Dublin County Development Plan 2016-2022

The South Dublin County Development Plan (SDCDP) 2016 – 2022 (SDCC, 2016) has a variety of statements in different sections which relate directly to the protection of biodiversity and natural heritage in the context of proposed developments. These include policies to ensure compliance with EU Habitats Directives and to ensure the protection of the integrity of European sites.

The following objectives contained within the SDCDP are relevant to the proposed development:

IE2 Objective 9:

'To protect water bodies and watercourses, including rivers, streams, associated undeveloped riparian strips, wetlands and natural floodplains, within the County from inappropriate development. This will include protection buffers in riverine and wetland areas as appropriate.'

IE7 Objective 5:

'To ensure external lighting schemes minimise light spillage or pollution in the immediate surrounding environment and do not adversely impact on residential or visual amenity and biodiversity in the surrounding areas.'

G2 Objective 5:

'To integrate Green Infrastructure as an essential component of all new developments.'

G2 Objective 6:

'To protect and enhance the County's hedgerow network, in particular hedgerows that form townland, parish and barony boundaries, and increase hedgerow coverage using locally native species.'

G2 Objective 9:

'To preserve, protect and augment trees, groups of trees, woodlands and hedgerows within the County by increasing tree canopy coverage using locally native species and by incorporating them within design proposals and supporting their integration into the Green Infrastructure network.'

G2 Objective 12:

'To seek to control and manage non-native invasive species and to develop strategies with relevant stakeholders to assist in the control of these species throughout the County.'

G2 Objective 13:

'To seek to prevent the loss of woodlands, hedgerows, aquatic habitats and wetlands wherever possible including requiring a programme to monitor and restrict the spread of invasive species such as those located along the River Dodder.'

G3 Objective 2:

'To maintain a biodiversity protection zone of not less than 10 metres from the top of the bank of all watercourses in the County, with the full extent of the protection zone to be determined on a case-by-case basis by the Planning Authority, based on site specific characteristics and sensitivities. Strategic Green Routes and Trails identified in the South Dublin Tourism Strategy, 2015; the Greater Dublin Area Strategic Cycle Network; and other government plans or programmes will be open for consideration

within the biodiversity protection zone, subject to appropriate safeguards and assessments, as these routes increase the accessibility of the Green Infrastructure network.'

G3 Objective 4:

'To uncover existing culverts and restore the watercourse to acceptable ecological standards and for the passage of fish, where possible.

G3 Objective 5:

'To restrict the encroachment of development on watercourses, and provide for protection measures to watercourses and their banks, including but not limited to: the prevention of pollution of the watercourse, the protection of the riverbank from erosion, the retention and/or provision of wildlife corridors and the protection from light spill in sensitive locations, including during construction of permitted development.'

G4 Objective 4:

'To minimise the environmental impact of external lighting at sensitive locations within the Green Infrastructure network to achieve a sustainable balance between the recreational needs of an area, the safety of walking and cycling routes and the protection of light sensitive species such as bats.'

G4 Objective 5:

'To promote the planting of woodlands, forestry, community gardens, allotments and parkland meadows within the County's open spaces and parks.'

G5 Objective 1:

'To promote and support the development of Sustainable Urban Drainage Systems (SUDS) at a local, district and county level and to maximise the amenity and biodiversity value of these systems.'

G6 Objective 1:

'To protect and enhance existing ecological features including tree stands, woodlands, hedgerows and watercourses in all new developments as an essential part of the design process.'

G6 Objective 2:

'To require new development to provide links into the wider Green Infrastructure network, in particular where similar features exist on adjoining sites.'

G6 Objective 3:

'To require multifunctional open space provision within all new developments that includes provision for ecology and sustainable water management.'

HCL1 Objective 1:

'To protect, conserve and enhance natural, built and cultural heritage features and restrict development that would have a significant negative impact on these assets.'

HCL12 Objective 1:

'To prevent development that would adversely affect the integrity of any Natura 2000 site located within and immediately adjacent to the County and promote favourable conservation status of habitats and protected species including those listed under the Birds Directive, the Wildlife Acts and the Habitats Directive.'

HCL12 Objective 2:

'To ensure that projects that give rise to significant direct, indirect or secondary impacts on Natura 2000 sites, either individually or in combination with other plans or projects, will not be permitted unless the following is robustly demonstrated in accordance with Article 6(4) of the Habitats Directive and S.177AA of the Planning and Development Act (2000 – 2010) or any superseding legislation:

1) *There are no less damaging alternative solutions available; and*
2) *There are imperative reasons of overriding public interest (as defined in the Habitats Directive) requiring the project to proceed; and*
3) *Adequate compensatory measures have been identified that can be put in place.'*

HCL13 Objective 1:

'To ensure that any proposal for development within or adjacent to a proposed Natural Heritage Area (pNHA) is designed and sited to minimise its impact on the biodiversity, ecological, geological and landscape value of the pNHA particularly plant and animal species listed under the Wildlife Acts and the Habitats and Birds Directive including their habitats.'

HCL15 Objective 1:

'To ensure that development does not have a significant adverse impact on rare and threatened species, including those protected under the Wildlife Acts 1976 and 2000, the Birds Directive 1979 and the Habitats Directive 1992.'

HCL15 Objective 2:

'To ensure that, where evidence of species that are protected under the Wildlife Acts 1976 and 2000, the Birds Directive 1979 and the Habitats Directive 1992 exists, appropriate avoidance and mitigation measures are incorporated into development proposals as part of any ecological impact assessment.'

HCL15 Objective 3:

'To protect existing trees, hedgerows, and woodlands which are of amenity or biodiversity value and/ or contribute to landscape character and ensure that proper provision is made for their protection and management in accordance with Living with Trees: South Dublin County Council's Tree Management Policy 2015-2020.'

2 METHODOLOGY

2.1 Assessment Methodology for Prediction of Effects

The EcIA process was undertaken in parallel with the proposed development design with a view of minimising the adverse ecological effects of the proposed development and, where possible, delivering benefits for biodiversity. Desk study data collection and field survey work were carried out as part of the EcIA process, with the objective of ensuring that sufficient data was collected to identify the designated sites, habitat areas and species that could be significantly affected by the proposed development. This information then informed the assessment of effects on the potential biodiversity receptors.

The area for which biological data was collected was based on an assessment of the ecological zone of influence of the proposed development. The ecological zone of influence is the area that could be affected by the proposed development, within which there is the potential for significant ecological effects. The starting point was that significant effects on designated nature conservation sites were unlikely to occur over 2km from the proposed Site boundary. However, adopting the precautionary principle, all SACs and SPAs within a 15km radius and all nationally designated sites for conservation within a 5km radius of the proposed development Site have been identified and impacts considered. Significant effects on priority habitats and species were considered unlikely at over 1km away. Desk study data were collected for this area (See Section 4.1), whilst field surveys focused on the site of the proposed development (See Section 4.2).

It should be noted that there was the potential for the zone of influence to be redefined during the assessment process in response to new design or environmental information, and / or for the geographical extent of field surveys to be extended to cover a greater extent of the desk study area (e.g., if the desk study identified species occurring offsite that could be significantly affected by the proposed development). In the end, such an increase in the study area was not required for this assessment (see Section 5.2).

The next stage of the assessment was to determine which, if any, of the sites, habitats and species within the zone of influence (referred to in this report as 'potential biodiversity receptors') had the potential to be significantly affected by the proposed development (see Section 5). A high level 'scoping' assessment was then undertaken (see Section 5) to differentiate effects that were sufficiently likely to be significant as to merit more detailed assessment, from those that could be assessed at a less detailed level as they were classified as not likely to be significant (referred to as 'scoped-out' effects).

The assessment of how the potential biodiversity receptors would likely be affected by the environmental changes associated with the proposed development was based not only on the results of the desk study and field surveys, but also on published information on the potential biodiversity receptors' status, distribution, sensitivity to these changes, biology, and knowledge of ecological processes and functions, as appropriate.

2.2 Desk Study

The following literature sources were checked for ecological information:

- The National Parks and Wildlife Service (NPWS) website was consulted with regard to the most up to date detail on conservation objectives for the Natura 2000 sites relevant to this assessment (https://www.npws.ie/) (NPWS, 2021);
- The National Biodiversity Data Centre (NBDC) website was consulted with regard to species distributions (https://maps.biodiversityireland.ie/Map) (NBDC, 2021); and,
- The EPA Envision website was consulted to obtain details about watercourses in the vicinity of the Site (https://gis.epa.ie/EPAMaps/) (EPA, 2021).

2.3 Field Survey

2.3.1 Habitat Survey

The initial Habitat surveys were undertaken on 4th March 2021 by a Senior MOR Ecologist, with follow up surveys undertaken on the 24th of May and the 8th of June. The initial survey aimed to assess the extent and quality of habitats present on the Site and to identify any potential ecological receptors.

The assessment was extended to also identify the potential for these habitats to support other features of nature conservation importance, such as species afforded legal protection under either Irish or European legislation. Based on the habitats present, additional species-specific surveys were also undertaken for both bats and amphibians, please see details below.

2.3.2 Protected / Notable Species

The methodologies used to establish the presence / potential presence of faunal species are summarised below. These relate to those species / biological taxa that the desk study and habitat types present indicated could occur on the Site.

Amphibians

The Site was assessed for its potential to provide sheltering, foraging and breeding habitat for amphibians. These included water bodies suitable for egg-laying, and terrestrial habitats comprising open areas with mixed-height vegetation, such as heathland, rough grassland, open scrub or water body margins. Suitable well drained and frost-free areas are needed to enable amphibians to survive the winter.

Badger

The survey aimed to identify and examine areas where badgers (*Meles meles*) might occur by noting any evidence of badger activity. This included:

- Mammal paths;
- Badger hairs caught in sett entrances / fences / vegetation;
- Paw prints;
- Evidence of foraging (usually in the form of 'snuffle holes');
- Latrines; and,
- Badger setts.

Bats

An initial assessment was carried out during the habitat survey for suitability of the habitats within the Site to support bat roosting, foraging and commuting. The inspection was undertaken using close-focusing binoculars.

The following criteria were used to assess mature trees onsite:

- Presence of natural cavities, splits, cracks, loose bark and rot holes in the trunk or boughs of the tree;
- Presence of dense and woody ivy (Hedera helix) growth that could be used by bats for roosting;
- Evidence of bat droppings, which may also be seen as a black streak beneath holes, cracks, branches, etc; and,
- Presence of smooth edges with dark marks and urine stains at potential entrances to roosts.

Given the presence of features suitable for roosting bats, follow up dusk emergence and activity surveys were undertaken at the Site to confirm if any of the trees were being used by roosting bats and to establish the level and type of bat activity onsite. These surveys were conducted on the 24th May 2021 and the 8th of June 2021.

All survey were undertaken in accordance with recognised best practice (Full details of the survey methodology are provide in Appendix B – Bat Report)

Birds

The Site was assessed for its potential to support important assemblages of birds of rare or notable species. Surveys aimed to identify and examine areas where wintering and breeding birds might occur. Any activity and potential nesting habitats were noted.

Otter

The survey aimed to identify and examine areas where otter might occur by noting any evidence of otter observed. Evidence of otter searched for included:

- Holts (features log piles, caves and cavities);
- Slides (flattered areas of mud or vegetation);
- Paw prints;
- Evidence of foraging (usually in the form of feeding remains such as fish scales, shellfish, etc.); and,
- Spraints.

Invasive species

The Site was assessed for the presence of any noxious / invasive species such as Japanese knotweed (*Fallopia japonica*) and any other invasive species.

Other Species

In addition, an assessment was carried out of the potential for the Site to support any other species considered to be of value for biodiversity.

2.3.3 Aquatic Surveys

As part of the proposed development works, the Baldonnell Stream will be rerouted. Therefore, an additional Stream Assessment was undertaken by Sweeney Consultancy to evaluate the ecological value and impact of the proposed in-river works. The following methodology was followed:

- Historical mapping was consulted to check the earlier course of the stream.

- Field surveys were undertaken on 4th May 2021. The stream habitat quality was assessed, based on its physical nature and ecology.
- Grid reference of photographs were recorded using a hand-held GPS device and photographs were taken with a digital camera.
- A pond-net sample was taken at ITM 703847 730198, and invertebrates were identified on the bankside to the lowest taxonomic level possible with the naked eye.
- The biological water quality was assessed following the most recent EPA Standard Operational Procedure for the Q-scheme methodology, which is based primarily on analysis of the aquatic invertebrate fauna.
- The habitat quality of a drain along a field boundary to the east, to which it is proposed that the stream be re-routed, was assessed visually.

2.3.4 Survey Limitations

No survey limitations were encountered.

2.4 Consultation

Consultation was undertaken as part of the design phase and initial assessment of the Site and a pre-planning meeting was held 1st April 2021 with South Dublin County Council.

The consultation and information provided was used to inform and refine the scope of the assessment undertaken and to develop appropriate mitigation measures for the proposed development, where necessary.

The key requirement in relation to biodiversity was to maintain a 10m riparian strip between the buildings and the Baldonnell Stream, that heavy engineering interventions on the stream should be kept at a bare minimum and natural attenuation, ponds and swales be used where possible.

Consultation was undertaken with Inland Fisheries Ireland (IFI) on the proposed rerouting of the Baldonnell Stream and a Site visit was held on the 18th of June 2021.

IFI had no objection in principle with the proposed re-alignment of the stream. IFI are of the opinion that the proposed route would provide a more natural riparian area for the stream. If planning is granted, IFI stipulated that this work must be carried out in accordance with an agreed design and method statement.

2.5 Assessment Methodology

The current Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2016) recognise that an ecological assessment cannot consider in detail every individual species or habitat that may potentially be affected by a proposed development. The EcIA process aims to identify those ecological receptors that could be significantly affected by the proposed development i.e., where the effects on the receptor are of sufficient concern that they could influence the planning decision) or for which the development could result in the breach of relevant legislation. The effects of the proposed development on these receptors are then assessed, taking into account the sensitive design measures (avoidance measures) and where necessary the mitigation measures incorporated as part of the proposed development. The scope of the EcIA is determined iteratively.

2.5.1 Significance Evaluation Methodology

As part of the high-level assessment reported in Section 5.1, the conclusion about whether effects are sufficiently likely to be significant as to merit more detailed assessment is informed by a judgement about whether:

- The Site, habitat or species population is of sufficient quality or size that an effect upon it could be significant; and,
- The environmental changes associated with the development are such that there is the potential for a significant effect to occur (i.e., for the integrity of a site or for the conservation status of a habitat area or species population to be affected).

If the answer to both of these questions is yes, the relevant receptor would be subject to more detailed assessment and the significance of effects would be evaluated based on the methodology that is outlined below.

2.5.1.1 Negative Effects

For biodiversity receptors, an effect is assessed as being significant if the favourable conservation status of the specified biodiversity receptor is compromised by the proposed development. Conservation status is defined by CIEEM (2016) as follows:

- "*Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area*;" and,
- "*Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.*"

The decision as to whether the conservation status of the specified biodiversity receptor has been compromised has been made using professional judgement, drawing upon the results of the assessment of how each receptor will be affected by the proposed development.

A similar procedure has been used for designated sites that are affected by the proposed development, except that the focus is on the effects on the integrity of each site, defined as "the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and / or the levels of populations of the species for which it was designated."

2.5.1.2 Positive Effects

A positive effect is assessed as being 'significant' if development activities are predicted to cause:

- An improvement in the condition of a habitat / species population from unfavourable to favourable – condition data are only available for some Natura sites, but professional judgement and a review of available literature has been used to apply the same principle to habitats / species elsewhere; or,
- Partial or total restoration of a site's favourable condition.

If a species population, habitat or site is already in favourable condition, it is still possible for there to be a significant positive effect. There is however no simple formula for determining when such effects are significant, given the complexities of assessing these types of effects. In such cases, decisions about significance have therefore been made on a case by case basis.

2.6 Identification of Potential Biodiversity Receptors

The assessment of the ecological zone of influence of the proposed development concluded that the development would be likely to result in changes in the extent and / or condition of the existing land cover on the Site, with potential effects on habitats and species on the Site. There is also the potential for effects on any areas that adjoin the Site, where fauna might make use of the land cover onsite.

The potential for offsite changes in noise and dust deposition was also assessed. It was concluded that, with the dust and noise control measures that have been built into the proposed development proposals, which will be important for avoiding significant effects on people as well as biodiversity, there will be no likelihood of significant effects associated with either dust or noise.

In summary, therefore, the ecological zone of influence of the proposed development is defined as:

- The Site of the proposed development (fauna and flora); and,
- Habitats adjoining the Site (fauna).

In the case of designated sites, a precautionary approach has been taken and the search area extended to identify sites outside of the zone of ecological influence. This information was used to further inform the assessment process and to ensure that the onsite habitats are not of importance for either habitats or species for which these sites have been designated.

As a basis for determining which biodiversity receptors need to be assessed within the zone of influence of the development, CIEEM's guidelines on EcIA recommend that consideration be given to the biodiversity conservation value of the sites, habitats and species that occur within the zone (as appropriate). The guidelines also refer to the need to consider the legal status that is afforded to some species and habitats (See Box 1).

Legal status needs to be considered because all developments must comply with the requirements of the law. By implication, therefore, there cannot be significant effects as a result of non-compliance with the law. However, it should be noted that, notwithstanding legal requirements, there is the potential for some legally protected species to be significantly affected in relation to their biodiversity conservation value.

In relation to biodiversity conservation value, only those designated sites, habitat types and species that fall within one or more of the categories defined in Box 1 are of sufficient importance that they could be significantly affected by the proposed development.

Drawing upon the biological data assembled for the purposes of this EcIA (Section 4), the potential receptors in relation to the proposed development are discussed in Section 5.

3 DESCRIPTION OF THE PROJECT

3.1 Site Context

The Site is located within the townlands of Kilbride, Dublin 22, in the Profile Park business park. The Site of the proposed development is ca.61,810 square metres (m^2). Under the South Dublin County Development Plan 2016-2022, the majority of the Site is zoned under objective EE which aims to, '*provide for enterprise and employment related uses*,' however, a small portion of the Site to the south is currently zoned under objective RU which aims to, '*protect and improve rural amenity and to provide for the development of agriculture.*'

The Site is accessed from the existing Site entrance on the Profile Park Road via the R134 regional road. The Profile Park Road currently runs through the central region of the Site. Directly to the east of the Site lies the Grange Castle Golf Club, the Google Data Centre is located to the west and the Baldonnell Road (L2001), Kilbride cemetery and the Baldonnell Casement Aerodrome lies to the south.

Immediately to the northwest of the Site are existing buildings and artificial surfaces which transition to areas of improved agricultural grassland, disturbed ground and spoil heaps within the Site boundaries. The disturbed ground within the southwest portion of the Site is predominantly bare or overgrown with ruderals / weeds and is composed of construction and demolition material. There is also an area of scrubland and the remains of an old, decommissioned sewage building to the east of the Site. A dry ditch runs along the southern boundary of the Site while a wet ditch is located along the eastern boundary of the Site, adjacent to a mature hedgerow / treeline. The Baldonnell Stream bisects the Site.

3.2 Watercourses within the Vicinity of the Site

The Site is situated within the Liffey and Dublin Bay Catchment [Catchment_ID: 09] and the Liffey_SC_090 subcatchment [Subcatchment_ID: 09_15] (EPA, 2021).

There is one hydrological feature of note within the vicinity of the Site. The Baldonnell Stream bisects the Site. The proposed development requires this stream to be rerouted east of its current course along the existing eastern drainage ditch onsite.

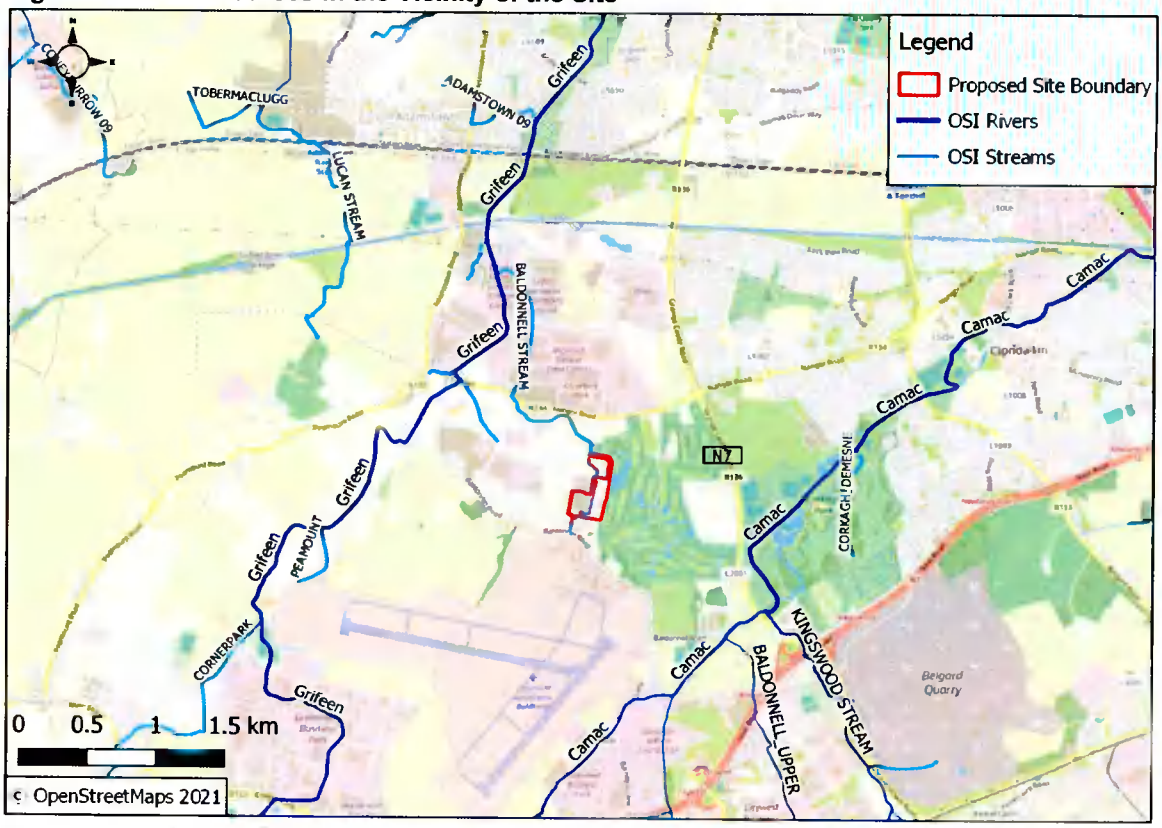
The Baldonnell Stream is a tributary to the Grifeen River and flows in a north / north-westerly direction for ca. 2.1km prior to discharging into the river. The Grifeen River flows in a northerly direction for ca. 4.2km from this convergence point, crossing under the Grand Canal through a siphon system, before discharge into the River Liffey at the Lucan Weir.

The River Liffey flows for ca. 21.1km from the weir before discharging into Dublin Bay. Dublin Bay is located 27.4km downstream of the Site and forms part of the South Dublin Bay SAC, the South Dublin Bay and River Tolka Estuary SPA, the North Dublin Bay SAC and the North Bull Island SPA.

According to the EPA 2013-2018 water monitoring events, the most up-to-date data at the time of writing this report, the Baldonnell Stream, the Grifeen River and the section of the River Liffey where the Grifeen River joins have '*good*' water quality status but their risk of not achieving a high water quality status is currently under *'review'* (EPA, 2021). However, further downstream (ca.7.0km from the Site) the River Liffey is considered to be '*at risk*' with an unassigned water quality (EPA, 2021).

The waterbodies within the vicinity of the Site are presented in Figure 3-1 below.

Figure 3-1: Watercourses in the Vicinity of the Site



3.3 Drainage Ditches

A dry ditch runs along the southern boundary of the Site while a wet ditch is located along the eastern boundary of the Site, adjacent to a mature hedgerow / treeline.

During the time of survey, the eastern ditch had no discernible flow; however, it got progressively wet towards the north of the Site. The dry ditch to the south of the Site is connected to the culverted stream.

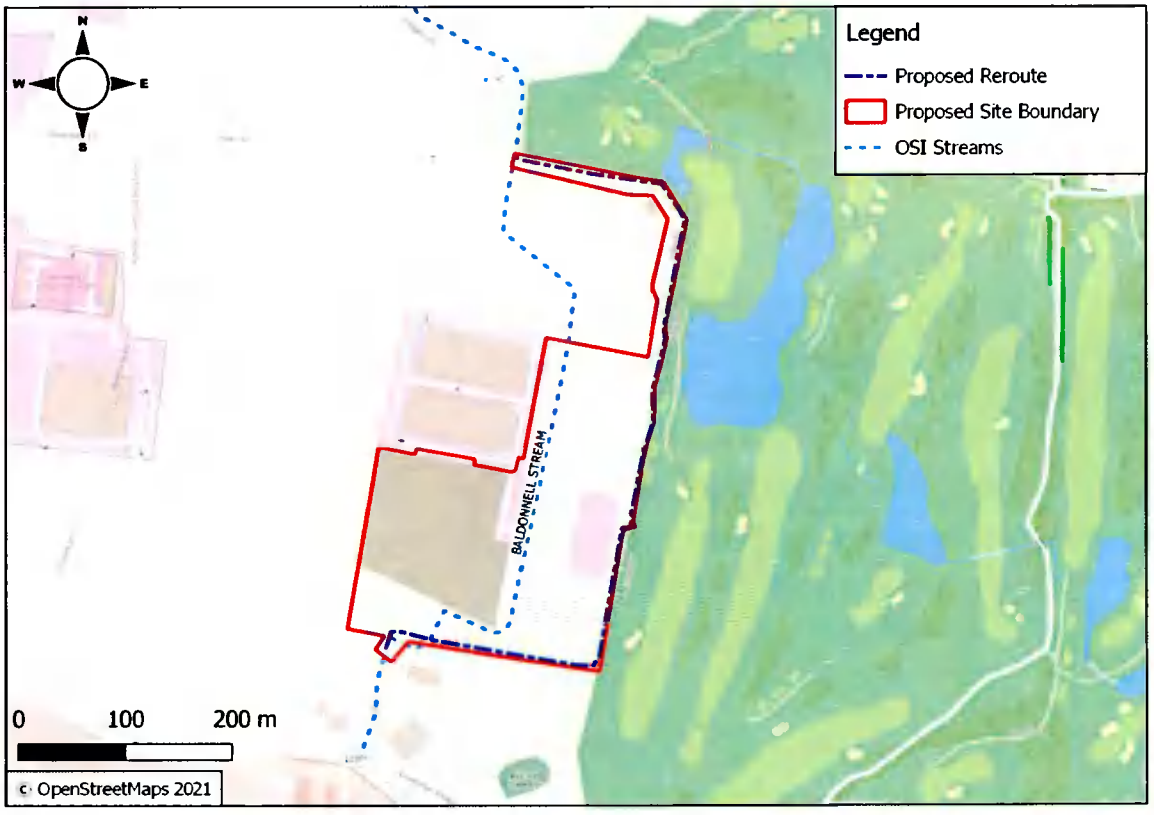
3.4 Proposed Development

The proposed development will consist of a 10-year permission for the following:

- Removal of an existing unused wastewater treatment facility onsite;
- Two (2No.) data centre buildings, DUB15 and DUB16, comprising of 8No. data halls and the various equipment areas required to support the IT servers contained within them. These buildings will comprise a total floor area of 33,577m^2 over two-storeys;
    - The first two storey data centre building (DUB15), located to the southwest of the Site, will comprise 16,865m^2 data storage use, ancillary office use and associated electrical and mechanical plant rooms, loading bays, maintenance and storage space;
    - A second two storey data centre building (DUB16), located to the southeast of the Site, will comprise 16,712m^2 data storage areas, ancillary office use and associated electrical and mechanical plant rooms, loading bays, maintenance and storage space; and,
    - Both data centre buildings will reach a height of 20m.

- Emergency generators and associated emission flues and plant are proposed in compounds adjacent to each data centre building;
- Gas powered energy generation is proposed to the northeast corner of the Site to provide electricity for the proposed development;
- The application proposes to re-route a watercourse, which was previously constructed through the centre of the Site pursuant to an earlier planning permission. It is proposed to reroute this watercourse along the eastern and southern boundary of the Site, refer to Figure 3-2 for indicative location;
- Landscaping is proposed to the south of the Site to screen the buildings;
- Fencing and security gates are proposed around the Site; and,
- New access roads within the Site are proposed alongside 71No. car parking spaces, 26No. cycle spaces, bin stores, Site lighting and all associated works including underground foul and storm water drainage attenuation and utility cables.

Figure 3-2 Proposed Stream Diversion



3.4.1 Data Centre Buildings

Each data centre building will be a two-storey building, (ground and first floors). Each floor will be identical, comprising of 4No. data halls on each floor, it is within these data halls where the IT servers will be located. Electrical switch-rooms will be located internally adjacent to the data halls.

Equipment for data hall cooling will be located on the roof of the building, with standby emergency generators located in external compounds at ground level.

The following will be accommodated in each of the main building areas:

- Data Centre Technical Areas;
    - Data halls;
    - Low voltage switchgear, UPS and battery rooms;
    - Water services plant room;
    - Fire suppression tank and valve rooms;
    - Storage and waste areas;
    - POP and IDF rooms;
- External Ground Level;
    - Containerised MV generators (with belly fuel tanks);
    - Containerised MV switchgear;
- Office and Logistics Area;
    - Security and entrance facilities;
    - Loading bay and debox area;
    - Toilets and showers;
    - Office areas;
- Roof;
    - Air handling units providing fresh air to the offices and other Power Base Build (PBB) spaces;
    - Air handling units providing make-up air the data halls;
    - Air handling units providing make-up air to electrical plantrooms (UPS rooms and battery rooms);
    - Medium voltage switchrooms;
    - MV/LV transformers; and,
    - Refrigerant condenser systems (direct expansion and variable refrigerant volume) supporting space heating and cooling units, and their air handling units.

Each building will have its own standalone back-up generator system from the containerised generators located adjacent to each building. In total there will be a maximum of 32No. generators across the Site if the full upgrade potential is deployed. These shall provide power to the Site in the event that the incoming supply is unavailable.

3.4.2 Gas Energy Generation Centre

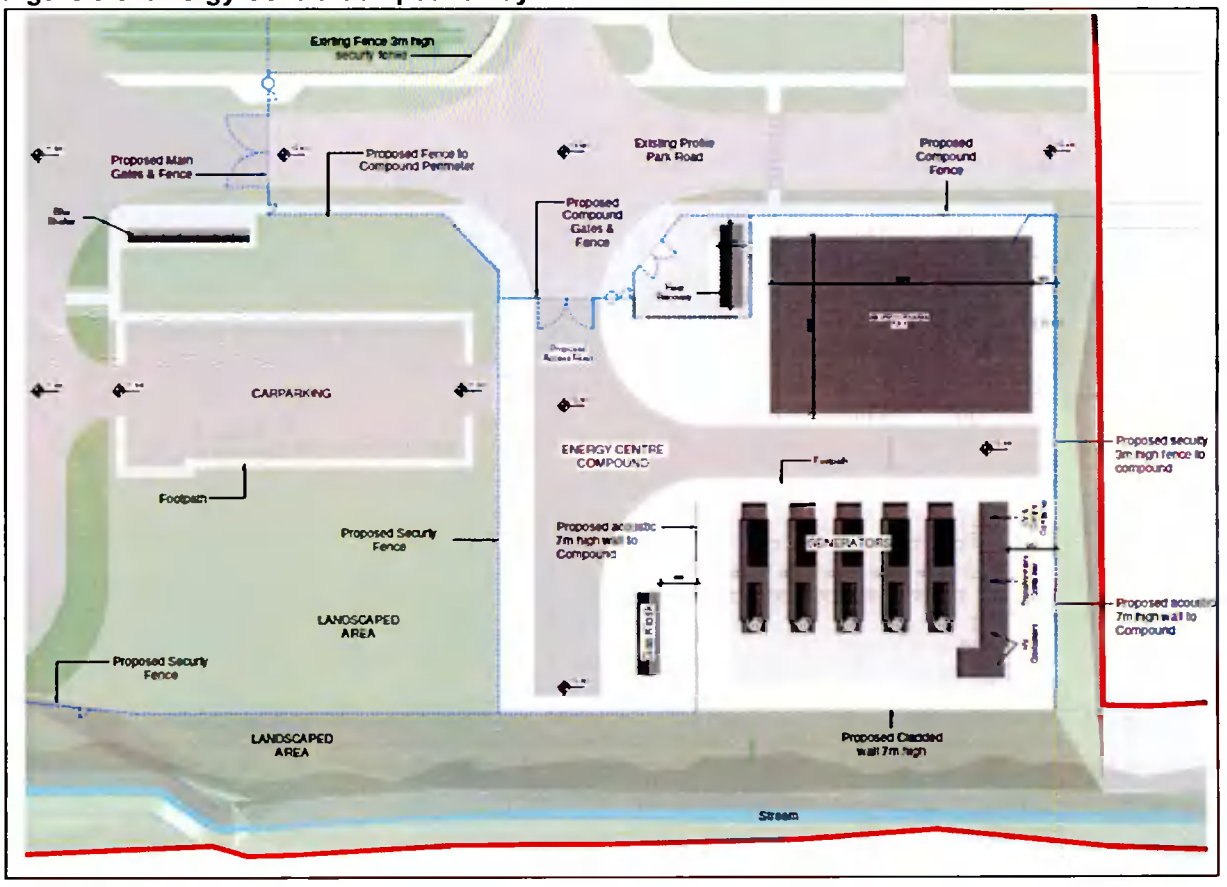
An energy generation compound is proposed to the northeast of the Site, refer to Figure 3-3 for context. This compound will comprise five (5No.) gas powered generators in their own acoustic containers, a heat recovery plant room (ca.35m^2), a distribution gas compound building (ca.23m^2) and an electrical substation (ca.623m^2) building.

The generators will provide the first phase of development with power. Future phases will import power from the grid. This will allow the data centre to use renewable power when available. As such power will initially be provided by the proposed onsite energy centre until such time that the facility is transferred to an alternative off-site power supply. At this time, the energy centre onsite will be decommissioned.

The gas generators selected will generate electricity to supply the data centre. The selected engines will be highly efficient with low emissions. The installed capacity of the generators will be 12.5MWe (10MWe @N) (ARUP, 2021). The generators will be designed to be continuously operational to meet the demand of the data centre, with a control system installed to monitor the data centre electrical demand which will control the operation of the generators and reduce the number of running sets depending on the data centre requirement.

The energy centre will be connected to the Gas Networks Ireland (GNI) grid. This will be a distribution gas connection and will provide the capacity required to ensure the security of supply.

Figure 3-3: Energy Centre Compound Layout



3.4.3 Fuel Storage

During the operational phase of the proposed development, there will be 32No. backup diesel generators onsite. These will require 859,248 litres of fuel which will be stored in 'belly tanks' within each generator container. All fuel storage will be integrally bunded with leak detection systems that conform to Irish regulations.

3.4.4 Earthworks

The development of DUB13 and DUB14, the two (2No.) existing data centres immediately northwest of the Site, involved bulk excavation of material and the remaining stockpiles and made ground are currently located within the southwest area of the Site.

Enabling works will include the removal of these existing stockpiles onsite for recovery and disposal at a licensed facility. It will also include for the excavation and removal of the decommissioned sewage treatment works and associated buried structures and foundations. These excavations will be filled with suitable engineering fill to allow for the construction of DUB16.

Additional Site clearance and preparation works will include service diversions and works associated with the diversion of the Baldonnell Stream.

During enabling works, unsuitable material or made ground encountered onsite will be excavated under all structures and associated infrastructure for removal from Site to a suitably licensed facility and replaced with suitable engineering fill.

The suitability of the excavated materials for re-use as acceptable earthworks fill be assessed in accordance with the requirements of the TII Specifications for Roadworks.

3.4.5 Drainage

Drainage from the proposed DUB15, DUB16 and Energy Centre development shall be drained by a completely separate system, with separate foul and surface water drains. The outfall of the surface water network will take place into the remaining channel of the existing watercourse, which after completion of proposed development will work only as a drainage ditch catering exclusively for surface water run-off coming from the proposed DUB15, DUB16, Energy Centre and existing DUB13 and DUB14 data centres. Foul water drainage outfall discharge will take place into existing Profile Park private foul drain network along The Fairways estate road which subsequently discharges into existing Irish Water Foul Sewer. See attached Drainage Layout.

Surface water discharges from the proposed development will be restricted in line with South Dublin County Council (SDCC) Water Services requirements to 2 litres/second/hectare. Any flows in excess of the allowable discharge rate will be retained onsite in underground attenuation facilities for storms up to and including the 1 in 100-year event + 20% climate change allowance. The proposed surface water drainage strategy is divided in three separate online attenuation systems which will serve separately DUB15, DUB16 and the Energy Centre.

The drainage systems have been designed in accordance with Part H Building Regulations, BSEN 752 Drain and Sewer Systems outside Buildings, the Greater Dublin Regional Code of Practice for Drainage Works, the Greater Dublin Strategic Drainage Study (GDSDS) and to the requirements of South Dublin County Council.

3.4.5.1 Surface Water

Surface water run-off for DUB15 attenuation system comprises two different sub catchments and consequently two separate attenuation tanks each one provided with hydro-brakes. As part of the proposed new surface water drainage layout, approximately 20m of the existing attenuation system for DUB14 will need to be removed and reinstated as new proposed attenuation tank connected into the existing attenuation pipes. DUB16 and Energy Centre attenuation systems have their own catchment areas and consequently separate attenuation tanks with hydro-brakes limiting the discharge to greenfield run-off rates. The three separate attenuation systems discharge into the same network which ultimately falls by gravity towards the existing open channel, refer to Appendix A for Drainage Layout.

Surface water discharges from the Site will be restricted in line with the Greater Dublin Regional Code of Practice for Drainage Works and South Dublin County Council Water Services requirements. The allowable outflow from the development will be restricted to 2 litres/second/hectare.

Flows in excess of the allowable discharge rate will be stored onsite in the form of underground storm attenuation concrete tanks. Additionally, SuDS measures will be incorporated into the development to improve the quality of waters discharging into the receiving surface water systems, namely porous paving and swales will allow for partial infiltration and all run-off from roads will be directed through petrol interceptors prior to reaching the attenuation system.

systems, namely porous paving and swales will allow for partial infiltration and all run-off from roads will be directed through petrol interceptors prior to reaching the attenuation system.

Peak surface water discharges from the Site (particularly during storm events) will be substantially reduced due to the restricted outflow from the development, thereby reducing the impact on the receiving drainage network. Also, the proposed watercourse diversion will significantly improve the existing surface water strategy throughout the Site, with benefits related to the quantity and quality of the water.

3.4.5.2 Foul Drainage

Foul drainage from the new data centres and the energy centre welfare facility shall be drained by a separate system to that of the surface water drainage system. Foul drainage from the proposed development shall drain by gravity and discharge to the existing 225mm foul drainage system along the Fairways Road, of Profile Park ownership, which subsequently discharges into Irish Water Foul sewer. No new connections will be required to the public sewerage system.

The foul drainage system will be designed to take discharges from office areas of both DUB15 and DUB16 data centre and Energy Centre welfare facility simultaneously to the discharge of both data hall areas including Reverse Osmosis system and Air Handling Units and testing / maintenance washdown of the Water Mist tanks. There will not be any chemicals added to the water serving the Data Hall.

3.4.6 External Lighting

External lighting will be provided outside the main structures and within the car-parking areas. A lighting pan has been submitted as part of the overall application, reference IE-DUBZZ-STE1-E0-ARP-DR-E-63000.

3.4.7 Landscaping

The Proposed Development design includes for boundary landscaping works. The proposed layout masterplan, reference IEDUBZZ-STE1-EO-MAL-LA-L-91001 and attached as Appendix D, presents both boundary and internal site breakout landscaping works.

3.5 Construction Procedures

During the construction phase, the methods of working will comply with all relevant legislation and best practice guidelines in reducing the environmental adverse effects of the works. Although construction phase adverse effects are generally of a short-term duration and are localised in nature, the adverse effects will be reduced as far as practicable through compliance with current construction industry guidelines.

A Construction Environmental Management Plan (CEMP) has been prepared and submitted as part of this apparition for the proposed works. The following Construction Industry Research and Information Association (CIRIA) guidance has been referred to and will be adhered to during the construction phase of the project to prevent water pollution:

- C532 – Control of Water Pollution from Construction, Guidance for Consultants and Contractors (CIRIA, 2011);
- CIRIA C741- Environmental Good Practice on Site (4th edition) (CIRIA, 2015);
- Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (NRA, 2005);
- Guidance for the Treatment of Bats Prior to the Construction of National Road Schemes (NRA, 2006);

- Guidance for the Treatment of Badgers Prior to the Construction of National Road Schemes (NRA, 2006);
- Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010); and,
- All works will be undertaken in accordance with the 'Requirements for the Protection of Fisheries Habitat during Construction and Development' (Inland Fisheries Ireland , 2016).

It is envisaged that the construction works will take approximately 60 months to complete. It is anticipated that the construction activities for the DUB15 building, first phase of the energy centre and all landscaping and external areas will take 18-months and that construction works for the DUB16 building are anticipated to last 10-months. The buildings are planned to be fitted out and commissioned in 6-month phases, with 4 fit out and commissioning phases per building.

Works will be limited to:

- Monday - Friday 07:00 hours – 18:00 hours
- Saturday 08:00 hours – 14:00 hours
- Sundays and Public Holidays Closed

An Ecological Clerk of Works (ECoW) will be appointed to the project and inspect the Sites in advance of works commencing and will undertake monthly Site inspections during the works as well as being present during away works adjacent to or near any waterbodies or the trees lines to ensure that they will be completed in line with the mitigation measures detailed within the CEMP.

4 STUDY RESULTS

4.1 Desk Based Study

Prior to conducting any Site surveys, a desk-based review of information sources was completed. This baseline information provided a valuable insight into the types of flora and fauna that may occur onsite and allowed for the identification of features / habitats located offsite that may require further assessment.

4.1.1 Statutory Nature Conservation Sites

In accordance with the European Commission Methodological Guidance (European Commission, 2002) and objectives HCL12 and HCL15 of the SDCDP (SDCC, 2016),a list of European sites that can be potentially affected by the proposed development has been compiled. Guidance for Planning Authorities prepared by the Department of Environment Heritage and Local Government (DoEHLG, 2009) states that defining the likely zone of impact for the screening and the approach used will depend on the nature, size, location and the likely effects of the project. The key variables determining whether or not a particular Natura 2000 site is likely to be negatively affected by a project are: the physical distance from the project to the site; the presence of impact pathways; the sensitivities of the ecological receptors; and the potential for in-combination effects.

Adopting the precautionary principle, all SAC and SPA sites within a 15km radius of the proposed development Site have been considered (Refer to Figure 4-1).

Seven (7No.) Natura 2000 designated sites were identified within 15km of the Site (Figure 4-2, Table 4-1).

Figure 4-1 Natura 2000 Sites within 15km

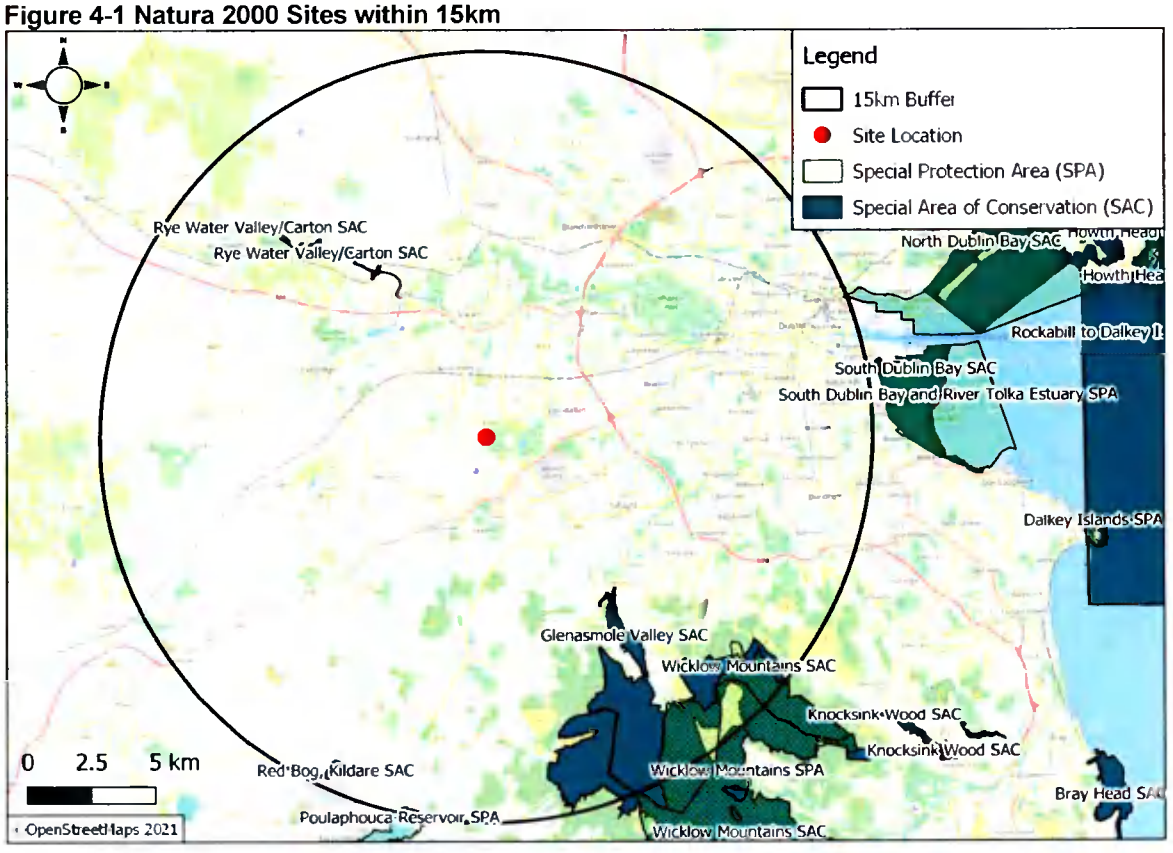


Table 4-1 Natura 2000 Designated Sites within 15km of the Site

Site Name	Code	Distance (km)	Direction from the Site
Special Areas of Conservation (SAC)			
Rye Water Valley / Carton	001398	6.2km	NW
Glenasmole Valley	001209	7.5km	SE
Wicklow Mountains	002122	9.2km	SE
Red Bog, Kildare	000397	13.8km	SW
Special Protection Area (SPA)			
Wicklow Mountains	004040	12.7km	SE
Poulaphouca Reservoir	004063	14.7km	SW
South Dublin Bay and River Tolka Estuary	004024	14.9km	NE

The Site is not located within or directly adjacent to any Natura 2000 sites, however, the boundaries of the four (4No.) SACs and three (3No.) SPAs are located within 15km from the Site.

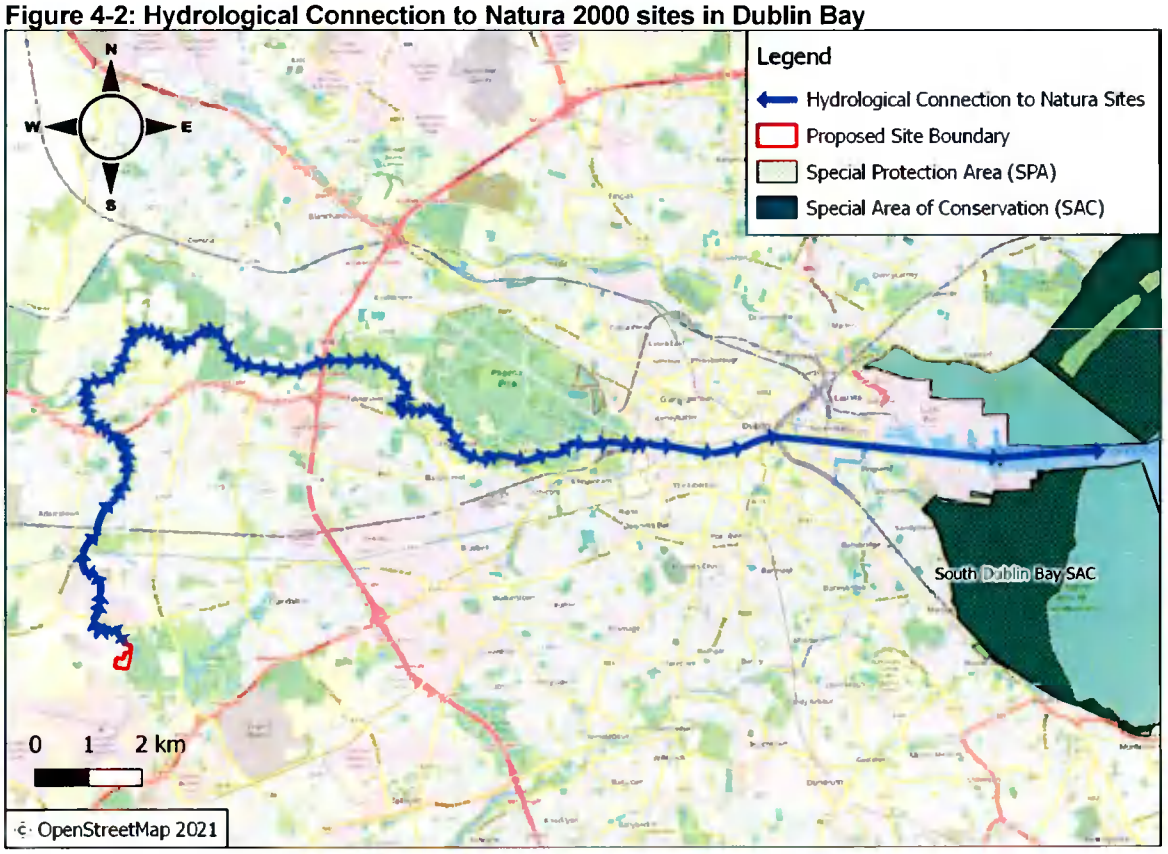
Given the distance, intervening lands and lack of impact pathways between the Site and the Glenasmole Valley SAC, Wicklow Mountains SAC, Rye Water Valley / Carton SAC, Red Bog, Kildare SAC, Poulaphouca Reservoir SPA and the Wicklow Mountains SPA, these Natura 2000 sites have been screened out from further consideration.

The Site is hydrologically connected to the South Dublin Bay and River Tolka Estuary SPA and South Dublin Bay SAC via the Baldonnell Stream which discharges into the Grifeen River, the River Liffey and eventually drains into Dublin Bay. It should also be noted that North Dublin Bay SAC and North Bull Island SPA form part of Dublin Bay and are located 19km NE of the Site.

Although the South Dublin Bay SAC is also located downstream of the Site and is located only 15.3km NE of the Site boundary, it is not considered that this Natura 2000 site could be affected by the proposed development considering the Great South Wall separates any water discharging into Dublin Port from the South Dublin Bay Annex I Habitats. Therefore, any pollutants in the bay would have to circumvent the breakwater and travel through a considerable expanse of open water to reach this Natura 2000 site. A similar breakwater in the form of North Bull Wall protects the North Dublin Bay SAC and North Bull Island SPA from potential pollutants. Therefore, these Natura 2000 sites have been screened out from further consideration.

However, areas of wetland habitat that make up the South Dublin Bay and River Tolka Estuary SPA are found on the Liffey side of the Great South Wall and the North Bull Wall and therefore could be affected by a major pollution event (albeit unlikely considering the Site is ca. 27.4km upstream). Given this hydrological connection to the South Dublin Bay and River Tolka Estuary SPA, this Natura 2000 site will be given further consideration to assess potential impacts resulting from the proposed development, refer to Figure 4-2 for context.

Figure 4-2: Hydrological Connection to Natura 2000 sites in Dublin Bay



4.1.2 Nationally Designated Conservation Sites

There are no Natural Heritage Areas (NHA) located within 5km of the Site. However, there are three (3No.) proposed Natural Heritage Area (pNHA) identified within 5km of the Site (refer to Figure 4-3 and Table 4-2).

Figure 4-3: Nationally Protected Sites within 5km

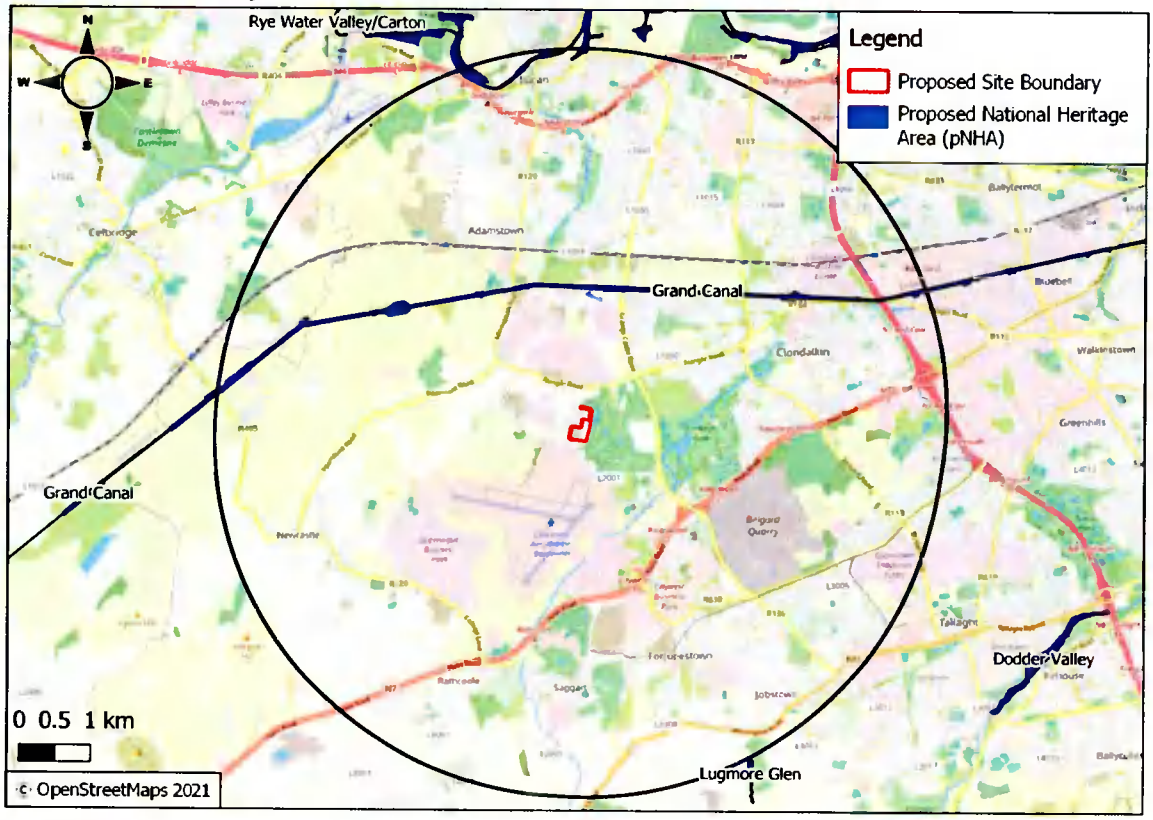


Table 4-2: National Protected Sites within 5km

Site Name	Code	Distance (km)	Direction from the Site
Proposed National Heritage Areas (pNHA)			
Grand Canal	002104	1.8km	N
Liffey Valley	000128	4.7km	N
Lugmore Glen	001212	4.9km	SE

4.1.3 Protected Species

According to the NBDC, the Site is located within an area of moderate bat suitability, ranging from 21.3 – 28.1 (NBDC, 2021). However, ca.150m south of the Site is an area of high suitability for bats, ranging from 36.4-58.5 (NBDC, 2021).

Table 4-3 provides a summary of records of legally protected or otherwise notable species that occur within a 2km grid square of the Site boundary (NBDC, 2021).

Table 4-3: NBDC Species within 2km of the Site

Common Name	*Scientific Name*	Date of last record	Designation
Bird Species			
Barn Swallow	*Hirundo rustica*	07/05/2016	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List

Common Name	*Scientific Name*	Date of last record	Designation
Black-headed Gull	*Larus ridibundus*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Common Coot	*Fulica atra*	28/07/2016	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Common Starling	*Sturnus vulgaris*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Common Swift	*Apus*	07/05/2016	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Common Wood Pigeon	*Columba palumbus*	28/03/2013	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section I and Annex III Section I Bird Species
Eurasian Tree Sparrow	*Passer montanus*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Great Black-backed Gull	*Larus marinus*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Great Cormorant	*Phalacrocorax carbo*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Herring Gull	*Larus argentatus*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
House Martin	*Delichon urbicum*	14/07/2017	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
House Sparrow	*Passer domesticus*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Lesser Black-backed Gull	*Larus fuscus*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Little Grebe	*Tachybaptus ruficollis*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Mallard	*Anas platyrhynchos*	31/12/2011	Wildlife Acts 1976 / 2000 EU Birds Directive Annex II Section I and Annex III and Section I Bird Species
Mute Swan	*Cygnus olor*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Northern Lapwing	*Vanellus vanellus*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Red List
Sand Martin	*Riparia*	07/05/2016	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Tufted Duck	*Aythya fuligula*	31/12/2011	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Bat Species			
Daubenton's Bat	*Myotis daubentonii*	19/08/2013	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Pipistrelle	*Pipistrellus sensu lato*	17/07/2011	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Soprano Pipistrelle	*Pipistrellus pygmaeus*	19/08/2013	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV

Common Name	*Scientific Name*	Date of last record	Designation
Terrestrial Mammals			
Eurasian Badger	*Meles meles*	13/02/2016	Wildlife Acts 1976 / 2000
Eurasian Pygmy Shrew	*Sorex minutus*	14/08/2012	Wildlife Acts 1976 / 2000
West European Hedgehog	*Erinaceus europaeus*	29/07/2013	Wildlife Acts 1976 / 2000
Amphibians			
Common Frog	*Rana temporaria*	20/05/2019	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex V
Crustaceans			
Freshwater White-clawed Crayfish	*Austroppotamobius pallipes*	18/08/2013	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II
Invasive Species			
American Mink	*Mustela vison*	30/07/2018	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Brown Rat	*Rattus norvegious*	09/10/2015	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Butterfly Bush	*Buddleja davidii*	11/06/2018	Medium Impact Invasive Species
Eastern Grey Squirrel	*Sciurus carolinensis*	30/07/2018	High Impact Invasive Species Regulation S.I. 477 (Ireland)
European Rabbit	*Oryctolagus cuniculus*	23/01/2017	Medium Impact Invasive Species
Greater White-toothed Shrew	*Crocidura russula*	26/03/2020	Medium Impact Invasive Species
Indian Balsam	*Impatiens glandulifera*	31/12/2017	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Japanese Knotweed	*Fallopia japonica*	07/05/2016	High Impact Invasive Species Regulation S.I. 477 (Ireland)
Spanish Bluebell	*Hyacinthoides hispanica*	07/05/2016	High Impact Invasive Species Regulation S.I. 477 (Ireland)

4.2 Field Survey

4.2.1 Habitats

The habitats described below were classified under Fossitt's: *A Guide to Habitats in Ireland* (Fossitt, 2000) and are all located within the Site.

Site Context and Surrounding Habitats

The Site is situated within the Profile Park business park. Directly to the east of the Site lies the Grange Castle Golf Club and immediately to the northwest lies two (2No.) commercial buildings which make up the current Digital Realty development. Further west lies the Google PPK Data Centre.

The Site is comprised of sparsely vegetated ground to the southwest, areas of improved agricultural grassland and scrub to the east. The Site is characterised by mature hedgerows / treelines along the eastern boundary, wet and dry drainage ditches and the Baldonnell stream and Profile Park Road which run through the northwest / central region of the Site. The remains of an old wastewater treatment plant (WWTP) are also present within the eastern portion of the Site.

A description of the habitats and features of ecological significance are outlined below, and their distribution is illustrated in Figure 4-4.

Amenity Grassland (GA2)

A small strip of amenity grassland / lawn was identified between the built structures adjacent to the northwest corner of the Site and the access road. The area surveyed consisted of a perennial rye grass (*Lolium perenne*) monoculture and is of limited ecological value.

Recolonising Bare Ground (ED3) / Spoil and Bare Ground (ED2)

To the south of the existing commercial buildings are lands composed of disturbed ground and spoil heaps, some of which have recolonising ruderals or weeds, others are bare and have limited vegetation growth.

The recolonising vegetation includes perennial ryegrass (*Lolium perenne*), Yorkshire fog (*Holcus lanatus*), cocksfoot (*Dactylis glomerata*), creeping buttercup (*Ranunculus repens*), lady's thumb (*Persicaria maculosa*), nettle (*Urtica dioica*), dandelion (*Taraxacum vulgaria),* common hogweed (*Heracleum sphondylium*), prickly sowthistle (*Sonchus asper*), ragwort (*Senecio jacobaea*), ribwort plantain (*Plantago lanceolata*), coltsfoot (*Tussilago farfara*), bramble (*Rubus fructicosus*), ground ivy (*Glechoma hederacea*), and fringed willowherb (*Epilobium ciliatum*).

Improved Agricultural Grassland (GA1)

In the eastern and southern section of the proposed Site, an area of improved agricultural grassland was identified, which stretches to a mature hedgerow / treeline along the eastern boundary of the Site. This habitat is predominantly composed of perennial rye grass, white clover (*Trifolium repens*), creeping buttercup, meadow foxtail (*Alopecurus pratensis*), field mustard (*Sinapis arvensis*), common vetch (*Vicia sativa*), and dock species (*Rumex spp*). The southern section is zoned as agricultural lands, however, there were no grazing livestock present or evidence of agricultural usage onsite at the time of survey.

Scrub (WS1)

Two areas of scrub habitat were identified within the proposed Site Boundary. A small section to the south of the Site and a larger distinctive square section along the eastern border of the Site. It should be noted that remains of an old sewage building were situated within the larger section of scrub. Access was restricted due to overgrowth and Site Safety.

Species included large areas of bramble and nettle, along with willowherb, creeping buttercup, coltsfoot, red campion (*Silene diocia*), wild tulip (*Tulipa sylvestris*), ivy, hogweed, meadow foxtail, field mustard, common vetch, dog rose (*Rosa canina*), bitter dock (*Rumex obtusifolius*), thistle (*Asteraceae spp.*).

Hedgerow / Treeline (WL1 / WL2)

The eastern Site boundary is made up of a mature hedgerow / treeline. This habitat is comprised of ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), elder (*Sambucus nigra*), and hazel (*Corylus avellana*). Other species noted were crab apple (*Malus sylvestris*), Norway maple (*Acer platanoides*), Scot's pine (*Pinus sylvestris*) and beech (*Fagus sylvatica*).

Brambles and nettles are frequent in the understorey layer throughout. Ivy (*Hedera hibernica*) is common both in the trees and in the ground layers. An array of herbaceous species was recorded in the ground layer of the hedgerows, including ground ivy, common vetch, creeping buttercup and willow herb.

Drainage Ditches (FW4)

A drainage ditch runs along the eastern boundary of the Site, adjacent to the hedgerow / treeline. The grassland onsite slopes towards this ditch which was predominately dry at the time of survey. However, this eastern drainage ditch gets progressively wet towards the northern end of the Site. The species noted within this ditch were watercress (*Nasturtium officinale*), butch vetch (*Vicia sativa*), perennial grass, bramble and nettles.

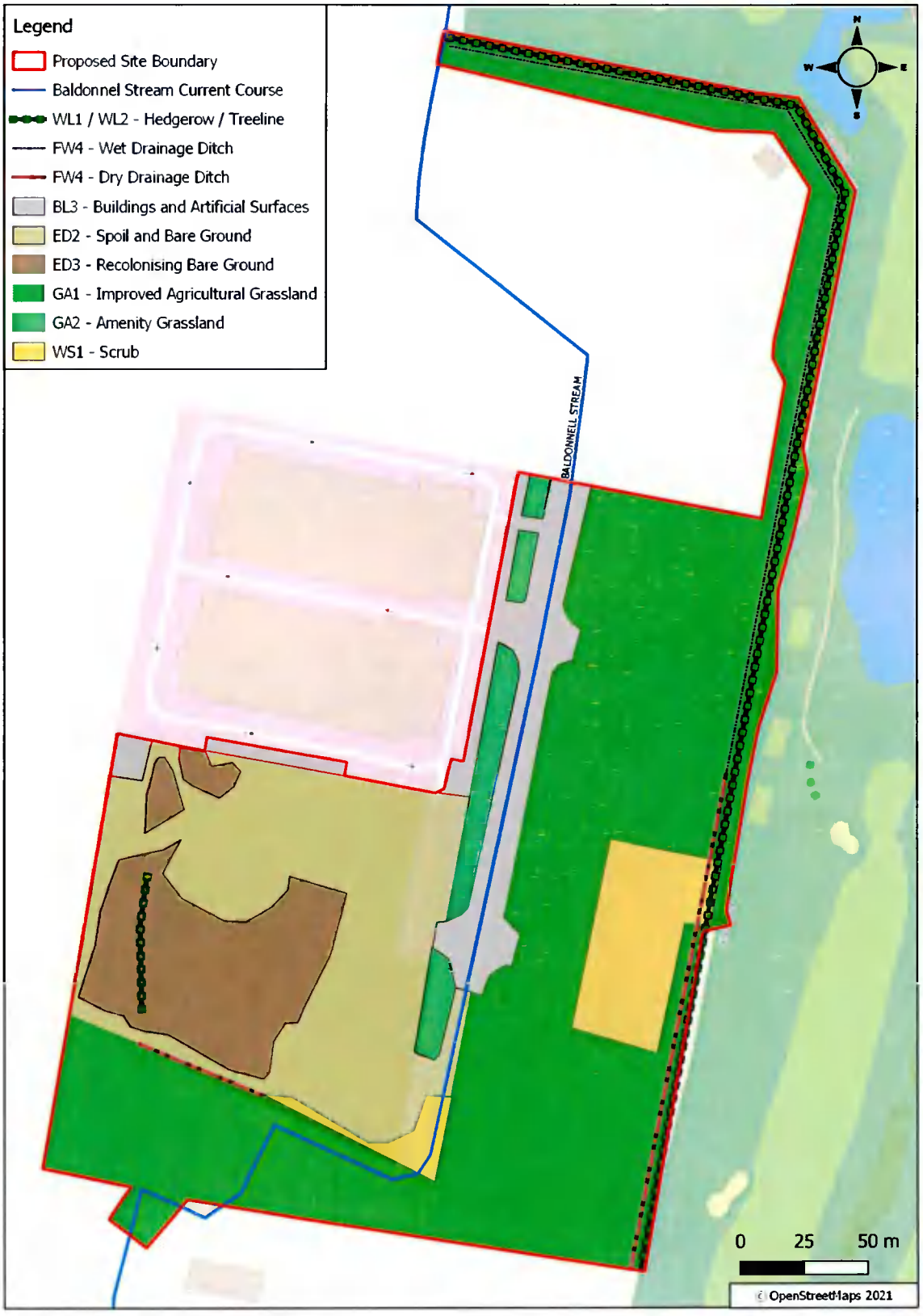
A second drainage ditch is present to the south of the Baldonnell Stream, this drainage ditch was dry at the time of the survey, however it is connected to the culverted stream.

Baldonnell Stream

The Baldonnell Stream flows through the northwest / central portion of the Site, to the east of the existing Digital Realty site. This stream is culverted in sections through round culverts and flows along the access track. It is currently enclosed by fencing.

An assessment carried out on the Baldonnell Stream by Sweeney Consultancy, attached as Appendix C, identified typical instream vegetation for small lowland streams with moderate flow including widespread *Apium nodiflorum* and *Berula erecta* and some *Veronica anagalis-aquatica* and *Veronica beccabunga*. This assessment also identified the river as having *'poor ecological quality'* with a Q-value of Q3 according to the Q-value scheme as defined by the EPA. Refer to Appendix C for further details.

Figure 4-4: Habitat Map



4.2.2 Fauna

Amphibians

The NBDC holds records of common frog within 2km of the Site (NBDC, 2021).

During the Site walkover, no observation of common frog spawn (*Rana temporaria*) or smooth newt (*Triturus vulgaris*) were made within the Site. In addition, given the steady flow within the Baldonnell Stream, which runs through the central portion of the Site, it is not considered that this waterbody is suitable for amphibians.

Furthermore, the drainage ditches onsite were predominately dry at the time of survey and therefore, it is not considered that these habitats would support breeding amphibians.

No additional surveys were considered necessary, and it is not considered that amphibians will utilise the Site.

Badger

The NBDC does hold one record of badger within 2km of the Site (NBDC, 2021). Mammal tracks were identified onsite, however, the Site survey did not identify any definitive evidence of badger activity within the Site boundary.

As badgers are common and widespread across Ireland, it is considered possible that badgers may commute through the Site. However, it is considered unlikely that the Site is of value to this species due to high levels of human activity.

Bats

According to the NBDC, the Site is located within an area of moderate bat suitability and three (3No.) bat species – Daubenton's bat, common pipistrelle and soprano pipistrelle – were identified within 2km of the Site within the past 10 years (NBDC, 2021).

The initial Site walkover identified a couple of mature trees within the hedgerow/treeline to the east of the Site that contain suitable crevices, loose bark and ivy growth for roosting bats. However, the targeted bat surveys did not identify any roosting activity onsite, only low levels of foraging and commuting bat activity.

Full details of the bat surveys and results are provided in Appendix B.

Birds

The areas of scrub and hedgerows/treelines have the potential to provide suitable nesting sites for a range of bird species.

The NBDC holds records of multiple amber and red list species within 2km of the Site (NBDC, 2021). During the initial Site walkover, no notable species were identified; however, a buzzard (*Buteo buteo*) and lapwing (*Vanellus vanellus*) have previously been observed onsite.

It should be noted that the habitats present are not considered suitable for any of the bird species designated for the South Dublin Bay and River Tolka Estuary.

Otter

The NBDC do not hold any records for otter within 2km of the Site over the last 10 years (NBDC, 2021). During the Site walkover, no evidence of otter was identified, and the Site is considered to be of limited value for this species.

However, there is a hydrological link between the Site and watercourses further down the catchment which potentially support otter. In addition, there are waterbodies within the golf course. However, there is limited connectivity for otters to waterbodies within the wider area due to the watercourses being culvert as they pass through urban / developed areas.

Aquatic Species

According to the NBDC White-clawed crayfish (*Austropotamobius pallipes*) have been recorded within 2km of the Site (NBDC, 2021). However, these recordings are from waterbodies unrelated to the Site and therefore, this species is not considered relevant to this project. The aquatic survey carried out by Sweeney Consultancy, attached as Appendix C, did not identify any notable or protected species within the Baldonnell Stream and this report noted that the current artificial channel was '*poorly created from an ecological perspective.*'

Invasive Species

No invasive species were noted within the study area.

Other Species

The NBDC holds records of protected and notable mammals within 2km of the Site such as Eurasian pygmy shrews (*Sorex minutus*), red squirrels (*Sciurus vulgaris*) and hedgehog (NBDC, 2021).

Hedgehogs and pygmy shrews are common and widespread species that typically occur in scrub, woodland and rank grassland habitats. Therefore, the majority of onsite habitats are not considered suitable for these species given the recolonising vegetation / bare ground and spoil. In addition, no evidence of these species was identified onsite. However, the hedgerow / treeline bounding the Site has the potential to support foraging and commuting hedgehogs and pygmy shrews.

In relation to red squirrels, the habitat walkover did not identify any evidence of red squirrels in the form of dreys and cone cores. It is not considered that red squirrels will utilise the Site due to their preference for coniferous woodlands and medium-large concentrations of trees. Although the broadleaved hedgerow / treeline along the eastern boundary of the Site is mature, as this is a linear habitat, it is not considered large or dense enough for a population of red squirrels to establish.

5 CHARACTERISTICS AND POTENTIAL IMPACTS OF THE PROPOSED WORKS AND MITIGATION MEASURES

5.1 Potential Impacts

Based on the methodology that is set out in Section 2, Table 5-1 sets out the findings of the evaluation of important and legally protected receptors. Each receptor is assessed and a scoping justification for each receptor is provided for the Construction and operational Phases.

Table 5-1: Valuation of Potential Ecological Receptors

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification
Protected Sites			
Natura 2000 Sites	European Communities (Natural Habitats) Regulations 1997 (as amended)	Internationally designated sites for conservation.	A Natura Impact Statement (NIS) was prepared as part of the overall planning application, in line with objectives HCL12 and HCL15 of the SDCDP (SDCC, 2016). The NIS concluded that the Proposed Development would not cause any significant adverse effects on any European designated sites or any of their designated features of interest provided the mitigation measures incorporated within the NIS are adhered to and that progression to Stage 3 of the Appropriate Assessment process (i.e., Assessment of Alternative Solutions) was not considered necessary. This receptor has been scoped out from further consideration as part of this EcIA.
Nationally Designated Sites	Wildlife Act 2000 (as amended)	Nationally designated sites for conservation.	There are no NHAs within 5km of the Site; however, there are three (3No.) pNHAs. These sites were included in this assessment in-line with objective HCL13 of the SDCDP (SDCC, 2016). Given the nature and scale of the proposed development, the water quality protection mitigation measures which will be put in place (see Section 5.2.1.1 and 5.2.2.1) and the nature of the habitats and features of interest for which the pNHAs have been designated, it has been concluded that no significant impacts are likely to occur to these sites. Therefore, this receptor has been scoped out from further consideration.
Habitats			
Amenity Grassland (GA2)	N/A	Low/No local value	This habitat is commonplace throughout Ireland, and as a monoculture, is of very little ecological significance. Therefore, any disturbance caused by the proposed development will be of little consequence. This habitat has been scoped out from further consideration.
Recolonising Bare Ground (ED3) / Spoil and Bare Ground (ED2)	N/A	Low Local Value	Recolonising bare ground is of low ecological value. Therefore, any alteration / loss of this habitat is not considered to be significant. This habitat has been scoped out from further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification
Improved Agricultural Grassland (GA1)	N/A	Low Local Value	This is a common habitat type throughout Ireland and provides limited ecological value. This habitat is not of significant conservation value and its loss is not considered to be significant. This habitat has been scoped out from further consideration.
Scrub (WS1)	N/A	Low Local Value	This is a common habitat type throughout Ireland and is not of significant conservation value. The areas of scrub onsite will be completely removed as a result of the proposed development. As these areas have the potential to support ground nesting birds, restrictions will apply in relation to the time of year in which vegetation can be cut (see Nesting Birds below) and more consideration will have to be given to these species. However, as these mitigation measures are species related, this habitat has been scoped out from further consideration.
Hedgerows / Treelines (WL1 / WL2)	Wildlife Act 2000 (as amended)	Low Local Value	All hedgerows / treelines bordering the Site will be maintained and protected as part of the proposed works. Standard tree protection measures will be implemented as part of the proposed works in line with G2 Objective 11 and 13, G6 Objective 1 and HCL15 Objective 3 of the SDCDP (SDCC, 2016), refer to Section 5.2.1.5 below. Therefore, this receptor has been scoped in for further consideration.
Drainage ditches (FW4)	N/A	Low Local Value	The Drainage ditches onsite are not considered to be of significant value. However, they do have the potential to support local biodiversity. In addition, these drainage ditches are connected to the Baldonnell Stream and subsequently the wider river network. As the proposed development involves the rerouting of the Baldonnell Stream into the eastern drainage ditch, mitigation measures will be put in place to avoid potential pollutants reaching the stream through the drainage ditch. The vegetation currently within and along the current drainage ditch network will be retained and protected where possible and a 10m landscaping buffer will be implemented / maintained to prevent any impacts to the current drainage ditch and future watercourse route in-line with objectives IE2 Objective 9, G2 Objective 13, G3 Objective 2, G3 Objective 5 and G6 Objective 1 of the SDCDP (SDCC, 2016). Therefore, this receptor has been scoped in for further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification
Baldonnell Stream	Water Framework Directive (2000/60/EC)	Low Local Value	Biological assessments carried out on the Baldonnell Stream concluded that this waterbody is currently of little ecological value. This is due to the artificial V-shaped channel utilised when rerouting the stream from its original course. The assessment concluded that the proposed in-river works could improve the ecological value of this stream due to the existing treeline and hedgerow along the proposed route providing '*mixed shade and allochthonous inputs*' and the opportunities to create varied flow. For further details refer to the Biological Assessment Report attached as Appendix C. Given the potential benefit to this habitat from the proposed works, this receptor has been scoped out from further consideration.
Flora and Fauna			
Flora	N/A	N/A	No plant species protected under the Flora Protection Order were noted on-site. Overall, the impact of the Proposed Development on both habitats and flora is considered unlikely to be significant. Therefore, this receptor has been scoped out from further consideration.
Bats	Wildlife Act 2000 (as amended) EU Habitats Directive Annex IV	Low Local Value	All trees with bat roost potential were surveyed and found to have an absence of roosting bats. There are no buildings within the Site. The bat activity onsite consisted of commuting and foraging bats along the hedgerow / treeline along the eastern border of the Site which will remain untouched and protected throughout the lifetime of this development. A large area of the Site is illuminated at night due to adjacent street / security lighting, and no bats were recorded to be commuting or foraging within these illuminated areas of the Site. However, given the presence of commuting and foraging activity along the Site boundaries and within the wider area, appropriate lighting measures will be implemented in order to ensure no impacts occur to any potential bats or nocturnal fauna utilising the area surrounding the Site, this is in line with IE7 Objective 5 and G4 Objective 4 of the SDCDP (SDCC, 2016) (see Section 5.2.2.2). In addition, noise mitigation measures have been included to reduce potential noise impacts on nocturnal species including bats. Therefore, taking a precautionary approach, this receptor has been scoped in for further consideration and mitigation measures are outlined below.
Badgers	Wildlife Act 2000 (as amended)	Low Local Value	No signs of badger activity were noted during the field survey and the Site is not considered to be of significant value for badger. However, given the potential, albeit unlikely, for badgers to commute through the Site, standard precautionary measures for terrestrial mammals will be incorporated into the construction works. Therefore, taking a precautionary approach, this receptor has been scoped in for further consideration and mitigation measures are outlined below (Section 5.2.1.6).

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Result and Justification
Otter	Wildlife Act 2000 (as amended)	Low Local Value	No signs of otter were noted during the field survey within the drainage ditches or the Baldonnell Stream. However, given the connectivity of the Baldonnell Stream to the River Grifeen and eventually the Liffey, there is potential that otter utilising the surrounding river network will be adversely affected during the construction / operational phase of the proposed development without appropriate mitigation measures. Therefore, mitigation measures will be implemented for the protection of water quality (Section 5.2.1.1 and 5.2.2.1) to ensure that no impacts occur to otter or any other aquatic species during the construction works further downstream in the wider river network. Taking a precautionary approach, this receptor has been scoped in for further consideration and mitigation measures are outlined below.
Birds	Nesting Birds Wildlife Act 2000 (as amended)	High Local Value	The areas of scrub onsite and hedgerow / treelines bordering the Site provide suitable foraging and nesting habitat for a range of common bird species. The hedgerows / treelines onsite which provide nesting potential will be protected, however the areas of scrub onsite will be removed as part of the proposed works. In order to avoid impacts on these species, all vegetation clearance required as part of the works will be scheduled to take place outside of the nesting bird season (typically considered to be between 1st March to 31st August – weather dependant). Birds may be subject to some temporary disturbance during construction; however, this is not considered likely to be significant.
Amphibians	Wildlife Act 2000 (as amended) EU Habitats Directive Annex V	Low Local Value	No waterbodies suitable for amphibians were identified within the Site boundary. However, if any amphibians are discovered onsite during the construction works, all works within the affected area will cease and the project ECoW will be consulted. This receptor has been scoped out from further consideration.
Other fauna	N/A	N/A	It is considered that the Proposed Development will not give rise to any significant impacts to other fauna, given the localised nature of the proposed development and the overall low ecological value of the Site. In addition, the general best practice measures for the protection of terrestrial and nocturnal fauna will protect any potential hedgehogs / pygmy shrews in the area alongside common species such as the fox, Irish hare or European rabbit (Section 5.2.1.6). Water protection measures will also protect any potential aquatic species present in the Baldonnell Stream, Grifeen River and River Liffey (Section 5.2.1.1 and 5.2.2.1).
Invasive Species	N/A	N/A	No invasive species were noted on the Site during the field surveys. However, measures will be implemented in order to ensure no invasive species are introduced to the Site during the construction phase (see Section 5.2.1.6). This is in compliance with G2 Objective 12 and 13 of the SDCDP (SDCC, 2016).

5.2 Mitigation Measures

5.2.1 Construction Phase

During the construction phase, all works will comply with all relevant legislation and best practice to reduce any potential environmental impacts. A CEMP will be prepared by the appointed main contractor and will be submitted to the planning authority in advance of works commencing as detailed in Section 3.5.

The following mitigation measures will be incorporated and adhered to in order to ensure that the proposed works do not result in any contravention of wildlife legislation:

- All activities will comply with all relevant legislation and best practice to reduce any potential environmental impacts. The mitigation measures detailed within this EcIA and the NIS will be fully adhered to;
- The Site manager shall ensure that all personnel working onsite will be trained and made aware of the mitigation measures detailed within this EcIA and the NIS;
- An ECoW will be appointed for the construction works and will be available should protected or notable species be encountered during operations at the Site; and,
- In advance of works, all Site personnel will receive a toolbox talk regarding the mitigation measures outlined in the CEMP, EcIA and NIS. Everybody working onsite must understand the role and authority of the ECoW.

5.2.1.1 Protection of Water Quality during Construction

As the proposed development requires the rerouting of Baldonnell Stream, there is a risk that during this process that potential runoff of pollutants / sediments during construction could adversely affect the water quality within this stream and downstream in the Grifeen River and the River Liffey.

Potential pollutants resulting from the construction of the proposed development include suspended solids, cementitious materials, silt and hydrocarbon leaks or spills. Sediment / silt have the potential to clog fish gills, degrade spawning habitats and cover / smother aquatic plants. The potential release of these pollutants would result in decreased food availability and therefore, could indirectly affect designated bird species by impacting their food supply. In addition, should hydrocarbons enter the river network, there is potential that the chemical balance of the river network could change which would be toxic for fish and other wildlife.

In order to ensure that the works do not have an impact on surface waterbodies onsite, in the locality or further downstream in the Grifeen and Liffey Rivers, mitigation measures will be put in place in accordance with best practice guidance to avoid impacts on these receptors. This is in line with objectives IE2 Objective 9, G2 Objective 13 and G3 Objective 5 of the SDCDP (SDCC, 2016).

Sediment control measures will be put in place to prevent suspended solids in runoff from entering the ditch network bordering the Site and ensure works are in line with the IFI guidelines. These measures will include the following:

- Silt traps / fences will be installed as required under the direction of the ECoW;
- Existing vegetation will be retained where possible;
- The working area will be clearly defined, and construction activities will be carefully planned to minimise ground disturbance; and,
- Runoff will be diverted away from stripped areas.

The following best practice guidelines will be followed, which are based on Inland Fisheries Ireland (IFI, 2016) and National Roads Authority (NRA, 2005) guidance documents:

- Construction stage works will be undertaken in accordance with an approved CEMP;
- Weather conditions will be considered when planning construction activities to minimise risk of runoff from Site;
- All materials shall be stored at the main contractor compound and transported to the works zone immediately prior to construction;
- Any chemical / oils to be stored onsite will be placed within a bund on an area of hardstanding to ensure there is no seepage of pollutants into groundwater or surface water;
- All bunds will have the capacity of the largest tank volume plus 10 percent, at a minimum, with additional capacity to hold 30mm of rainfall;
- Prior to any works commencing, all construction equipment will be checked to ensure that they are mechanically sound, to avoid leaks of oil, fuel, hydraulic fluids and grease;
- Preventative maintenance and relevant maintenance logs will be kept for all onsite plant and equipment;
- Excavations will be left open for minimal periods to avoid acting as a conduit for surface water flows;
- Any pouring of concrete will only be carried out in dry weather. Washout of concrete trucks will not be permitted on the Site;
- Washouts of equipment used for concrete operations will be done either offsite or within a designated washout area, which will comprise a container that will capture the washout material / water for reused or disposal offsite;
- Any spillage of cementitious materials will be cleaned-up immediately;
- Steel tanks will be protected from corrosion;
- All drainage from bund areas must be directed to secure containment prior to suitable disposal;
- Fuel will be delivered onsite by a dedicated tanker or in a delivery bowser dedicated to that purpose;
- The Appointed Contactor will put in place a specific, step-by-step refuelling procedure which will be communicated to all relevant employees onsite;
- All valves should be of steel construction and the open and close positions should be clearly marked;
- Fuels, lubricants and hydraulic fluids for equipment used in the construction Site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to current best practice;
- Vehicle or equipment maintenance work will be carried out in a designated area on the Site. In the event that refuelling is required outside this area a spill tray will be employed during the refuelling operation;
- No surface water runoff will be discharged onto public roads, foul sewers or adjacent property;
- In order to prevent potential water pollution risk when drainage lines are in place but not fully commissioned, no discharges to the surface water drainage system at the Site

will be made until all drains are fully connected to the proposed and approved Petrol Interceptor; and,

- Measures will be implemented to minimise waste and ensure correct handling, storage and disposal of waste.

The proposed measures to remove the risk from potential contamination and emergency procedures to be implemented in the event of an accidental release or spill of potentially contaminating substances are outlined below.

These procedures will be communicated to all relevant Site staff. At a minimum, the following measures will be in place:

- Adequate spill kits including absorbent booms and other absorbent material will be maintained onsite;
- Any spillage of cementitious materials will be cleaned-up immediately;
- All contractor workers will be appropriately trained in the use of spill kits; and,
- Any sediments impacted by contamination will be excavated and stored in appropriate sealed containers for disposal offsite in accordance with all relevant waste management legislation.

5.2.1.2 Watercourse Diversion

As the Baldonnell Stream's connects into a wider river network, the watercourse diversion will be designed in order to maintain and enhance connectivity for foraging and commuting species along the river system.

The following design and mitigation measures will be implemented throughout the in-river works / watercourse diversion works to prevent any adverse impact to species within the wider river system:

- The construction of the new channel must be carried out as far as possible in advance of the actual diversion of flow, and ideally bankside vegetation of native streamside tree and bush species should be well established;
- The new channel should be constructed as a two-stage channel comprised of a stepped profile, and should be gently profiled to minimise the risk of erosion with the channel bottom formed of coarse non eroding material i.e., rocks, cobble & gravel;
- The new channel should contain occasional boulders to create variations in flow type;
- The new channel should ensure connectivity for commuting and foraging species;
- The new channel should be constructed in such a way as to minimise suspended solids released when the river is re-routed. The use of loose fine-grained materials in the new channel construction should be strictly limited;
- Earth moving works and construction activities should be avoided in the area within 10m of the bank of the Baldonnell Stream, with exception to the area where the realigned channel joins with the existing river channel. However, prior to the commencement of works, this area should be fenced off prior to the commencement of works;
- Where practicable, existing vegetation along the drainage ditch into which the Baldonnell Stream will be rerouted should be retained and supplemented / managed as required to maintain sheltered commuting routes and connectivity along the river corridor and to the wider landscape;

- Landscaping measures will be implemented to ensure that the watercourse continues as a contiguous natural habitat for a range of species, with new sections of riparian habitat to be created as part of the works being planted with semi-mature trees;
- The Contractor appointed shall ensure that all personnel working onsite are trained in pollution incident control response; and,
- The Contractor or Ecologist shall establish contact with Inland Fisheries Ireland (IFI) before works commence and as per consultation, all works will be carried out with an approved design and method statement.

A suitably qualified Ecologist must be present on-site when the watercourse is initially diverted and to ensure that the measures detailed above have been adhered to.

Furthermore, as per the NRA Guidelines, quarterly monitoring for a period of one (1No) year following completion of the works should be undertaken to ensure that the mitigation measure have been effective.

5.2.1.3 Ecological Clerk of Works (ECoW)

An Ecological Clerk of Works (ECoW) will inspect the Site in advance of works commencing, and will undertake Site inspections as required during the works to ensure that the works will be completed in line with the mitigation measures stipulated within the CEMP, including:

- Inspection and monitoring of all watercourse sections along or in close proximity to the proposed works;
- Inspection of all surface water treatment measures; and,
- Monitoring of stockpiles within close proximity to the watercourse.

Where the ECoW has carried out an investigation of a release of sediment to a watercourse causing a plume, the following procedure shall be followed:

- The relevant NPWS and IFI staff shall be notified immediately;
- The discharge generating the sediment discharge shall be stopped immediately;
- The contractor will be required to take immediate action and to implement measures to ensure that such discharges do not re-occur;
- Works shall not recommence until appropriate corrective measures to avoid any repetition are put in place. Such measures shall be agreed with the ECoW following consultation with the NPWS and IFI and shall be in accordance with the requirements of these control measures; and,
- Where the ECoW considers that the risk of a sediment release is high, the contractor will be informed, and protective action will be undertaken. Where the contractor does not take immediate action the ECoW shall instruct the contractor to take action and the same shall be reported to the Contract Manager and the Client.

The ECoW will also be responsible for carrying out regular audits of the Contractors CEMP and will be the primary person involved in the developers monitoring role. In addition, the ECoW will be delegated sufficient powers so that he / she will be authorised to instruct the contractor to stop works and to direct the carrying out of emergency mitigation / clean-up operations. In addition, the ECoW will maintain a register indicating whether all mitigation measures have been carried out satisfactorily.

5.2.1.4 Earthworks

As the proposed development will involve the removal of existing stockpiles and the excavation of material, the following mitigation measures will be implemented to avoid the

generation of dust or dirt and limit the potential of these suspended solids to enter the onsite watercourses:

- Earth movements and soil stripping operations will not be carried out during dry and windy weather without suitable mitigation measures;
- Stockpiles, tips and mounds will be constructed in such way to minimise dust creation; and,
- Water bowsers, sprays and mists will be used to suppress dust arising from stockpiles, and screening activities, during dry weather as required;
- Within the construction area, the ground to be stripped of existing cover / vegetation will be kept to the absolute minimum required for the works; and,
- All excavated material or existing stockpiles onsite for disposal will be removed to a suitably licensed facility offsite.

5.2.1.5 Protection for Hedgerows / Treelines

During construction, all boundary hedgerows / mature treelines will be retained and protected from unnecessary damage in line with G2 Objective 6, G2 Objective 9, G2 Objective 13, G6 Objective 1, HCL1 Objective 1 and HCL15 Objective 3 of the SDCDP (SDCC, 2016). During construction, care will be required to protect trees from both direct and indirect disturbance. The following protection measures will be adhered to during the works:

- Trees, treelines and hedgerows to be retained that will be located within close proximity to the construction areas will be fenced off by effective construction proof barriers before construction works commence. These barriers will remain in place for the duration of the works to prevent accidental disturbance and define the limits for construction vehicles and other construction staff;
- Care will be required to prevent disturbance to root systems – a buffer zone / construction exclusion zone of unexcavated ground will be maintained along the retained hedgerows and mature tree;
- Where machinery access has to encroach areas within close proximity to the retained hedgerows / treelines, a Root Protection Area (RPA) will be established, and suitable ground protection will be put in place to prevent any significant soil compaction or root damage. This should take the form of suitable strength ground protection mats or cellular confinement system capable of supporting the appropriate weight;
- All weather notices will be erected on the fences, and the fencing will be inspected on a regular basis during the construction process;
- Trench digging or other excavation works for services etc. will not be permitted within close proximity to retained trees and hedgerows unless approved and supervised using methods outlined in BS5837: Trees in relation to design, demolition and construction (2012);
- No materials, equipment or machinery will be stored within close proximity to retained hedgerows and trees;
- In order for treeline protection measures to work effectively, all personnel associated with the operation of heavy plant machinery must be familiar with the above principles for the protection of treelines;
- Care will be taken when planning Site operations to ensure that wide or tall loads or plant with booms, jibs and counterweights can operate without coming into contact with

retained trees. Such contact can result in serious damage to them and might make their safe retention impossible;

- Notice boards, wires, etc. will not be attached to any trees. Site offices, materials and contractor parking will all be outside the Construction Exclusion Zone; and,
- The retained trees will be assessed following the completion of the construction works.

As part of the proposed development, there will be additional landscape planting along the eastern boundaries in line with G2 Objective 5, G2 Objective 6, G2 Objective 9, G4 Objective 5, G6 Objective 1 and G6 Objective 3 of the SDCDP (SDCC, 2016) (see Appendix C – Landscape Plan). The plantings will comprise a mix of native woody shrubs and trees, including fruit-bearing species, which will provide cover and potential foraging opportunities for wildlife.

5.2.1.6 Protection of Species

Birds

In order to ensure no impacts, occur to birds as a result of the proposed development, the following mitigation measures will be put in place:

- Any vegetation clearance required will take place outside of the nesting bird season (1st March to 31st August), as per Section 40 of the Wildlife Act 1976, as amended by Section 46 of the Wildlife (Amendment) Act 2000;
- In the event that works need to be undertaken within the main breeding season, this would be undertaken in consultation with NPWS;
- Prior to the vegetation removal the ECoW will inspect the Site and the project ECoW will inspect the Site during the vegetation removal works; and,
- Should birds nest within the active working area during the construction phase, works within the area will stop within the area and the project ECoW will be consulted.

Following the implementation of above-mentioned mitigation measures it is considered unlikely that birds will be significantly impacted as a result of the proposed development. It should be noted that birds may be subject to some temporary minor disturbances during construction. However, due to the fact that birds are a highly mobile species, should any birds be impacted, these birds will move away from the disturbance to a more suitable area, therefore, this is not considered likely to be significant.

Badgers / Terrestrial Mammals

Given that the NBDC holds records of badgers within 2km of the Site and other terrestrial mammals are known to occur within the wider area and may inadvertently enter the Site, in order to ensure that the works in relation to the proposed development do not have significant impacts on mammals, general construction procedures and mitigation measures, which are in line with the NRA (now TT) guidance for Badgers and Objective HCL15 Objective 1 of the SDCDP (SDCC, 2016) will be undertaken.

- Where deep excavations will be required onsite, appropriate measures to protect mammals from ingress will be installed;
- Should construction works be required outside of daylight hours, the appointed project ECoW will be consulted as required; and,
- If unidentified burrows are identified within the works area during construction, works will cease within that area and the project ECoW will be contacted for advice.

Invasive species

To mitigate against the unintentional introduction of invasive species during construction and decommissioning works, the following mitigation measures will be followed in line with Objectives G2 12 and 13 of the SDCDP (SDCC, 2016):

- All vehicles, machinery and any other equipment used for the works will be washed prior to its use at the Site to prevent the import of plant material or seeds;
- Before machinery or equipment is unloaded at the Site, equipment will be visually inspected to ensure that all adherent material and debris has been removed;
- Any vehicles and machinery that are not clean will not be permitted entry to the Site;
- All materials to be imported to the Site including additional planting will be sourced from a reputable supplier and records of all material and supplies will be maintained;
- In advance of works, all Site personnel will receive a toolbox talk with regards to invasive species; and,
- Everybody working onsite must understand the role and authority of the ECoW managing the issue of the non-native species.

Other flora and fauna

No significant impacts on other flora and fauna are expected, therefore, no mitigation additional to the ones specified above are required.

5.2.1.7 Noise Mitigation Measures

Construction noise can impact on various species through disturbance, behavioural impacts, stress and displacement from feeding grounds. Therefore, noise mitigation measures will be implemented during the construction phase of the proposed development. This will ensure that there will be no adverse effects on nocturnal species utilising the Site and wider landscape. These measures are in line with the recommendations of BS 5228: Part 1 (2014) and the European Communities (Noise Emission by Equipment for Use Outdoors) Regulations, 2001, they include the following:

- Only plant with the lowest noise ratings will be selected and its location will be based on the least impact in terms of noise;
- Plant will only be left running during works and will be switched off at all other times. Plant will not be left idling; and,
- All construction related works, aside from emergencies will be carried out during normal working hours, as outlined in Section 3.5.

It should be noted that the Site is located within a predominantly urban environment with associated road infrastructure. Given the location of the Site, there are elevated levels of human and noise related disturbance within the area, therefore, any species utilising the area will be habituated to elevated levels of activity or will avoid this area. In addition, the construction works are temporary in nature and species can and will move away from any temporary disturbance to alternative habitats within the wider surrounding area.

It can therefore be concluded that provided the above mitigation measures are followed during construction, the proposed development will not cause significant adverse effects to species during the construction phase.

5.2.2 Operational Phase

5.2.2.1 Protection of Water Quality during the Operational Phase

The additional built structures onsite will result in an increase in storm water runoff. However, as the proposed drainage system will utilise petrol interceptors, swales, porous paving, attenuation tanks and hydrobrakes, as described in Section 3.4.5.1, it is not considered that the proposed development will have any adverse effect on water quality within the Baldonnell Stream, Grifeen River or further downstream in the South Dublin Bay and River Tolka Estuary SPA.

Furthermore, during the operational phase of the proposed development, foul drainage will connect into the existing Profile Park and Irish Water infrastructure as described in Section 3.4.5.2. No alterations to this approved system are proposed.

It should also be noted that the diversion of the Baldonnell Stream and the associated drainage system design will have slight positive impacts on the quality and quantity of water onsite.

As mentioned in Section 3.4.3, 859,248 litres of fuel will be stored onsite to be used if the gas power supply is compromised. This fuel will be stored in 'belly tanks' and will be integrally bunded with leak detection systems that conform to Irish regulations. All relevant personnel will be trained in the prevention and control of spillages. This training will include the correct use of spill kits. Spill kits will be located at various locations around the facility.

5.2.2.2 Measures for the Protection of Nocturnal Species

Nocturnal mammals are impacted by lighting. Therefore, it is important that lighting installed within the Site is completed with sensitivity for local wildlife while still providing the necessary lighting for human usage.

The lighting strategy has been designed to mitigate against any potential impacts on nocturnal species in line with the Bat Conservation Trust (BCT) Guidelines on '*Bats and Artificial Lighting in the UK*' (BCT, 2018) and, IE7 Objective 5 and G4 Objective 4 of the SDCDP (SDCC, 2016). The lighting strategy involves avoiding excessive lighting. The following measures have been taken into consideration during the lighting layout design:

- Avoidance of excessive lighting;
- Light Emitting Diodes (LED's) will be used and the brightness will be set as low as possible;
- Lighting will be aimed only where it is needed, with no upward lighting;
- Lighting will be directed away from landscaped areas;
- Lighting lux levels will not exceed 1.0 Lux along most of the diverted Baldonell stream; and,
- Lighting will be turned down / off when not required.

Following the installation of the lighting for the proposed development, the project ECoW will undertake a further Site inspection in order to check the lighting patterns and lux levels along the Site boundaries.

5.2.2.3 Measures for Noise during the Operational Phase

The following noise mitigation measures have been incorporated into the proposed development design to ensure that any elevated noise levels onsite are reduced as far as practicably possible:

- Gas turbine generators will be attenuated to achieve a maximum sound pressure level at 1m from any point of the generator of 65dBA;

- Diesel generators will be attenuated to achieve a maximum sound pressure level at 1m from any point of the generator of 75dBA;
- Dry air chillers will be attenuated to achieve a maximum sound pressure level at 1m from any point of the chiller of 55dBA;
- Condensers and AHUs will be attenuated to achieve a maximum sound pressure level at 1m from any point of 70dBA;
- A minimum 9m high solid noise wall will be constructed around all diesel generator yards, with louves;
- A minimum of 4m high solid noise parapet will be constructed on the main data centre buildings to shield receptors from chiller noise;
- A minimum 7m high solid noise wall will be constructed around the north, east and south sides of the energy centre building; and,
- In addition, the standby generators will only be tested one at a time, during daylight hours and for a maximum of one hour, once a week. This will ensure that any nocturnal or crepuscular species in the area are not affected during their peak times of activity.

It should be noted that the Noise Assessment carried out for the proposed development states that noise levels will comply with noise limits at the adjoining golf course and at residential receptors during normal operation and during emergency procedures. Therefore, it is not considered likely that noise will affect species potentially utilising these areas surrounding the Site.

It should be noted that the character of the noise onsite will be constant, with no tonal or impulsive qualities and that urban areas regularly experience noise between 40-60dBA, which is often exceeded near road infrastructure. Therefore, it is considered that any species utilising the wider landscape will be habituated to a high level of noise.

In addition, the proposed weekly generator tests will take place during daylight hours and therefore will not affect any nocturnal species.

5.3 Ecological Enhancement Measures

5.3.1 Stream Diversion

According to the Biological Assessment of Baldonnell Stream, diverting the watercourse could have significant positive effects on the aquatic and riparian habitats and species in the area. A stepped bank and occasional boulders in the stream will allow for varied flow and subsequently create a variety of habitats for aquatic invertebrates. As part of the landscape plan, wetland trees will be placed around this water feature and a 10m riparian strip will be maintained from the top of the bank to all buildings. The diversion of the stream meets G3 Objective 4 and G6 Objective 2 of the SDCDP (SDCC, 2016).

5.3.1.1 Wetland Habitat

Planting of marsh / aquatic vegetation along the margins of the diverted Baldonnell Stream will jump start the plant establishment process which will lead to earlier colonisation of wetland species such as aquatic invertebrates and birds. The landscape plan, attached as Appendix D, has included for the planting of marsh marigold (*Catha palustris*), yellow flag iris (*Iris pseudacorus*), flowering rush (*Butomus umbellatus*), bog bean (*Menyanthes trifoliata*), marsh cinquefoil (*Potentilla palustris*), water mint (*Mentha aquatica*) and arrowhead (*Sagittaria sagottifolia*) within and along the banks of the stream and suitable riparian vegetation i.e., sedges, ferns, rush and grass species adjacent to the stream.

5.3.2 Landscape Planting

The hedgerow / treeline bordering the Site will be maintained and protected during the construction and operational phase of the proposed development. In addition, enhancement plantings will be implemented along the banks of the rerouted stream to strengthen this linear habitat and provide more screening for the Grange Castle Golf Club and planted in pockets along the southern boundary of the Site as part of the 10m landscape buffer from the Baldonnell Stream.

All hedgerow / treeline planting will provide shelter and a source of food for a variety of species throughout the year including birds, small mammals, amphibians and butterflies. It will also allow movement of species such as badger and other small mammals across the Site and provide connectivity to the wider landscape.

To maximise the value of these features, plantings will include a mix of native species, of local providence and / or those that have a known attraction or benefit to local fauna as listed in Table 5-2. It should be noted that ornamental trees will also be planted as part of the proposed development as features within the landscaped area of the Site and along the access track, however, along the eastern and southern boundaries of the Site, only native species will be introduced.

Table 5-2: Hedgerow / Tree Planting Mix Onsite

Type of Planting	Common Name	*Scientific Name*
Woodland / Treeline Planting	Birch	*Betula pendula*
	Oak	*Quercus rober*
	Bird Cherry	*Prunus padus*
	Field Maple	*Acer campestre*
Hedgerow Mix	Blackthorn	*Prunus spinosa*
	Holly	*Ilex aquifolium*
	Hawthorn	*Crategaeus monogyna*
Boundary Wetland Trees	Black Alder	*Alnus glutinosa*
	Goat Willow	*Salix caprea*
Street Trees	Turkish Hazel	*Corylus columa*
	Field Maple	*Acer campestre*
	Small Leaved Lime	*Tilia cordata greenspire*
Ornamental trees	Cherry Blossom	*Prunus spp.*
	Japanese Maple	*Acer Palmatum*
	Evergreen Magnolia	*Magnolia grandiflora*
	Crab Apple	*Malus spp.*

5.3.3 Wildflower Meadows

Wildflower meadows are not only visually attractive but can also significantly enhance the local biodiversity and support a rich community of wildlife. Planting a range of flowering plants, including night-scented plants, can provide a source of nectar for a range of species such as butterflies and bumblebees and will attract insects for bats to feed on.

As part of the proposed landscape plan areas of bee friendly and hare resistant native wildflower mixed will be introduced onsite. All wildflower planting will consist of a mixture of native species, see Table 5-3 and Figure 5-1 for examples of wildflower habitats and a potential native planting mix.

It should be noted that surrounding the designated wildflower areas, an unmown natural grassland will be present.

Figure 5-1: Wildflower Meadow Habitats

Table 5-3: Example of a 100% Native Wildflower Meadow Seed Mixture General Purpose

Common Name	*Scientific Name*	Percentage Mix (%)
Birdsfoot Trefoil	*Lotus Corniculatus*	2.5%
Common Cat's Ear	*Hypochaeris Radicata*	1.0%
Corn Poppy	*papaver Rhoeas*	2.5%
Cowslip	*Primula Veris*	0.2%
Field Scabious	*Knautia Arvensis*	2.5%
Lady's Bedstraw	*Galium Verum*	7.5%
Lesser Knapweed	*Centaurea Nigra*	7.5%
Meadow Buttercup	*Ranunculus Acris*	7.5%
Meadow Vetchling	*Lathyrus pratensis*	1.0%
Musk Mallow	*Malva Moschata*	7.5%,
Ox Eye Daisy	*Leucanthemum Vulgare*	2.0%,
Ragged Robin	*Lychnis Flos Cuculi*	0.2%,
Red Campion	*Silene Dioica*	7.5%,

Common Name	*Scientific Name*	Percentage Mix (%)
Ribwort Plantain	*Planatago Lanceolata*	7.5%
Rough Hawkbit	*Leontodon hispidus*	0.5%,
Salad Burnet	*Sanguisorba Minor*	7.5%,
Self-Heal	*Prunella Vulgaris*	7.5%,
Small Scabious	*Scabiosa columbaria*	0.5%,
Common Sorrel	*Rumex Acetosa*	2.5%,
White Campion	*Silene Alba*	7.0%,
Wild Carrot	*Daucus carota*	5.0%,
Upright Hedge Parsley	*Torilis Japonica*	2.5%
Yarrow	*Achillea millefolium*	2.5%
Yellow Rattle	*Rhinanathus Minor*	5.0%
Wild Clary	*Salvia Verbenaca*	2 .5%

5.3.4 Hibernacula and Habitat Piles

Artificial hibernacula or habitat piles will be installed around the Baldonnell Stream to provide shelter and hibernation sites for amphibians. These habitats act as refuges and hibernation sites for amphibians as well as a host of other species of inverts and small mammals, refer to Figure 5-2 and 5-3.

Hibernacula are constructed through the placement of either piles of rocks or logs around the margins of wetland areas / onsite waterbodies and adjacent to drainage ditches. They should be placed in a position with adequate sunlight and can be tailored to accommodate amphibians and invertebrates by placing them nearer to the water's edge.

Figure 5-2: Typical hibernaculum and cross section

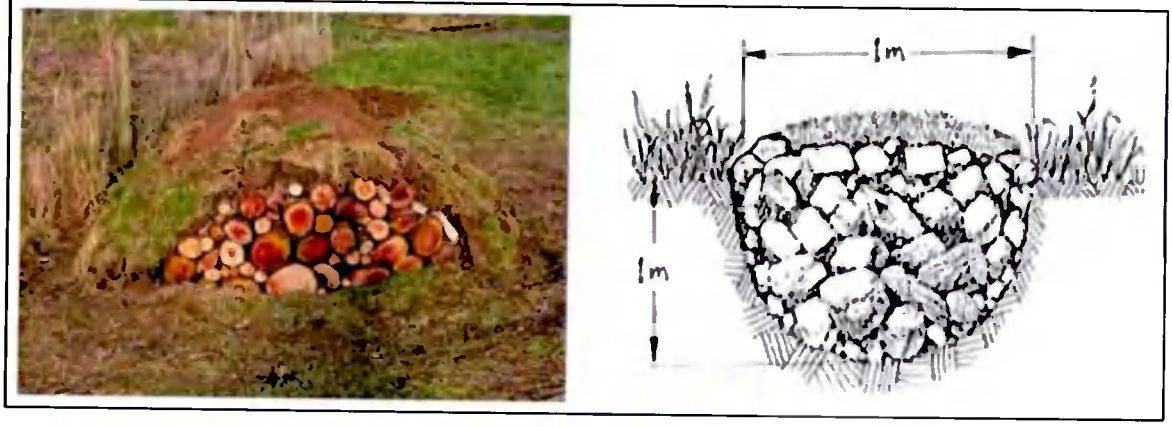


Figure 5-3: Habitat Piles

6 CONCLUSIONS

Based on the findings of a detailed desk-based study, a review of all the ecological information available for the Site and wider area and a field survey by MOR Ecologists, it is considered reasonable to conclude the following:

- The Site itself is currently of low local ecological value;
- The Site is located in an area predominantly made up of improved agricultural grassland, recolonising species and spoil and bare ground and is zoned under objective EE which aims to, '*provide for enterprise and employment related uses.*' It is not of value to any Annex I or Annex II species or Red listed birds;
- The bat surveys did not identify any bats roosting onsite;
- The proposed development will not result in any significant impacts on ecological receptors identified both onsite and in the surrounding area following the implementation of appropriate mitigation measures;
- The re-routing of the Baldonnell Stream has the potential to significantly improve the health of the watercourse and subsequently biodiversity in the area; and,
- The proposed additional landscaping and protected species enhancement measures will supplement the existing treelines onsite in the longer term and provide additional habitats for species already existing within the area.

7 REFERENCES

ARUP. (2021). *Energy Centre Description.*

BCT. (2018). *Bats and artificial lighting in the UK Bats and the Built Environment Series.* Bat Conservation Truct & Institute of Lighting Professionals.

CIEEM. (2016). *Guildlines for Ecological Impact Assessment in the UK and Ireland; Terrestrial, Freshwater and Coastal, 2nd edition.* Winchester.

CIRIA. (2011). *C532 – Control of Water Pollution from Construction, Guidance for Consultants and Contractors .*

CIRIA. (2015). *C741 - Environmental Good Practice on Site (4th edition).*

Cummins, K. C. (2013). *Birds of Conservation Concern in Ireland 2014-2019.* Birdwatch Ireland .

DECLG. (2015). *Planning Policy Statement.* Dublin: Department of Environment, Community and Local Government.

DoEHLG. (2009). *Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities.* Department of Environment, Heritage and Local Government .

EPA. (2021). *EPA Map Viewer.* Retrieved from EPA Maps: http://gis.epa.ie/Envision

European Commission. (2002). *Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of articles 6(3) and (4) of the Habitats Directive 92/43/EEC.* Luxembourg: Office for official publications of the European Communities .

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

Government of Ireland. (2018). *Project Ireland 2040 National Planning Framework.* Department of Housing, Planning and Local Government.

IFI. (2016). *Guidelines on Protection of Fisheries Durin Construction Works in and Adjacent to Waters .* Inland Fisheries Ireland.

Inland Fisheries Ireland . (2016). *Guidance and Protection of Fisheries during Construction Works in an adjacent to Water .* Dublin: IFI.

NBDC. (2021, May). *National Biodiveristy Live Maps.* Retrieved from National Biodiveristy Data Centre: http://maps.biodiversityireland.ie/

NPWS. (2021, January). *National Parks and Wildlife Service.* Retrieved from National Parks and Wildlife Service: https://www.npws.ie

NRA. (2005). *Guidelines for the crossing of watercourses during the construction of national road schemes.* National Roads Authority.

NRA. (2006). *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes.* Dublin: National Roads Authority.

NRA. (2006). *Guidelines for the Treatment of Bats prior to the Construction of National Road Schemes.* Dublin: National Roads Authority .

NRA. (2010). *Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads.* National Roads Authority.

SDCC. (2016). *Development Plan 2016 - 2022.* Dublin: South Dublin County Council.

APPENDICES

APPENDIX A

APPENDIX B

July 2021

Bat Survey Report

INXN DUB15/16

On behalf of
Digital Netherlands VII B. V.

Profile Park, Nangor Road, Clondalkin, Dublin 22

MALONE O'REGAN ENVIRONMENTAL

QUALITY
I.S. EN ISO 9001:2015
NSAI Certified

MALONE O'REGAN

Form ES - 04

MALONE O'REGAN ENVIRONMENTAL

Ground Floor – Unit 3
Bracken Business Park
Bracken Road, Sandyford
Dublin 18, D18 V32Y
Tel: +353- 1- 567 76 55
Email: enviro@mores.ie

Title: Bat Survey Report, INXN DUB15/16, Digital Netherlands VII B. V., Profile Park, Nangor Road, Clondalkin, Dublin 22

Job Number: E1794

Prepared By: Allison Flaherty **Signed:** _____

Checked By: Dyfrig Hubble **Signed:** _____

Approved By: Dyfrig Hubble **Signed:** _____

Revision Record

Issue No.	Date	Description	Remark	Prepared	Checked	Approved
01	16/07/21	Bat Survey Report	Final	AF	DH	DH

Bat Survey Report

INXN DUB15/16

Digital Netherlands VII B. V.

Profile Park, Nangor Road, Clondalkin, Dublin 22

Contents

FIGURES

TABLES

1 INTRODUCTION

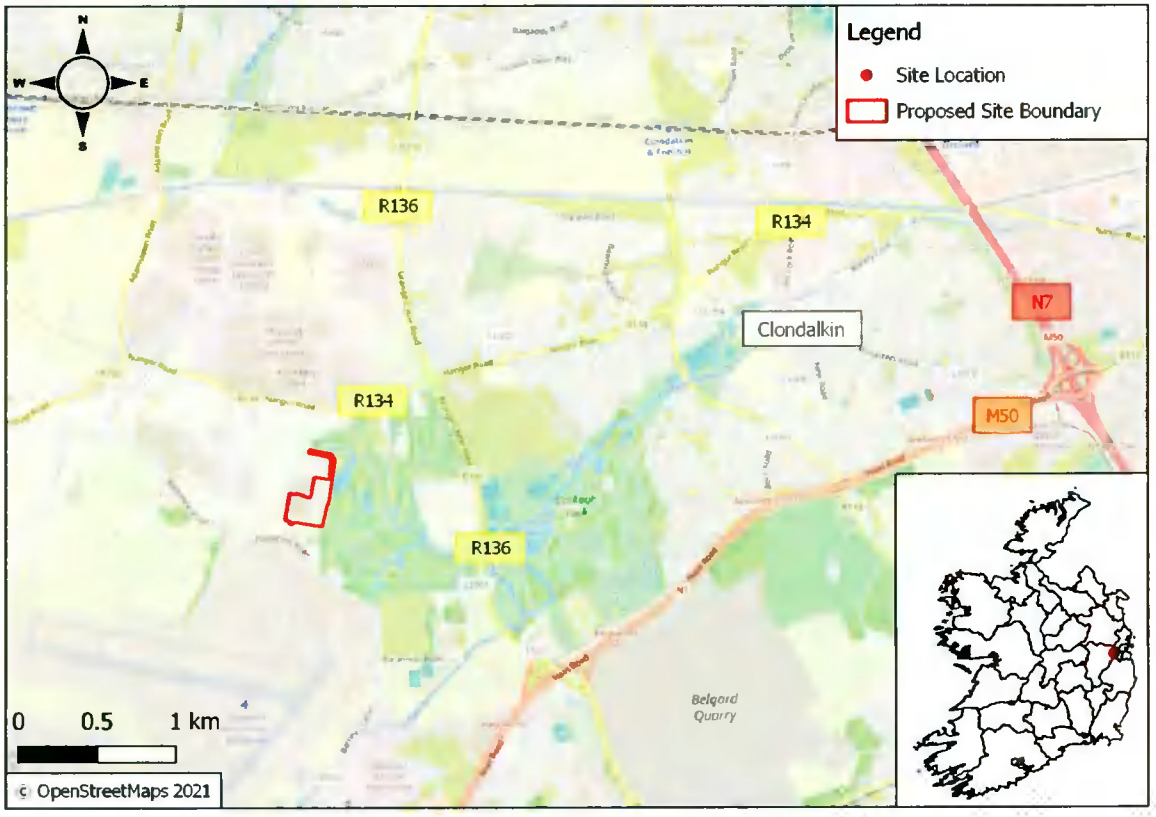
1.1 Background

This Bat Survey Report has been prepared by Malone O'Regan Environmental (MOR) was commissioned by RKD Architects Ltd. on behalf of Digital Netherlands VIII B.V. ('the Applicant'), to present the findings of bat surveys undertaken at the Site for a proposed data centre and all ancillary works (Proposed Development), at Profile Park, Kilcarbery, Dublin, Co. Dublin (OS Reference O 03785 30338).

The baseline ecological survey of the Site highlighted the potential for bat roosts to occur within some of the mature trees bordering the Site. It was therefore deemed necessary for further survey work to be carried out to determine whether or not any bat roosts occur within the Site or within close vicinity to the Site that may be impacted due to the proposed development works.

The location of the proposed development ('the Site') is shown in Figure 1-1.

Figure 1-1: Site Location



1.2 Relevant Legislation

All Irish bat species are protected by law under the Wildlife Act 1976 and its subsequent amendments. They are afforded full protection under this act, which makes it a criminal offence for anyone without a licence to:

- Kill, injure or handle a bat;
- Possess a bat (whether alive or dead);
- Disturb a roosting bat; and,

- Damage, destroy or obstruct access to any place used by bats for shelter, whether they are present or not.

In addition to domestic legislation, bats are also protected under the EU Habitats Directive (92/43/EEC). All Irish bats are listed in Annex IV of the Habitats Directive and the lesser horseshoe bat is further listed under Annex II, which make it an offence to:

- Deliberately capture, injure or kill any bat; or,
- Deliberately disturb a bat, in particular any disturbance which is likely;
    (a) To impair their ability:
        (i) To survive, to breed or reproduce, or to rear or nurture their young; or,
        (ii) To hibernate or migrate.
    (b) To affect significantly the local distribution or abundance of the bat species; or,
- Damage or destroy a breeding site or resting place of a bat.

Therefore, the destruction, alteration or evacuation of a known bat roost is a notifiable action under current legislation and a derogation license must be obtained from the National Parks and Wildlife Service (NPWS) before works can commence.

Furthermore, it should also be noted that any works interfering with bats and especially their roosts, including for instance, the installation of lighting in the vicinity of the latter, may only be carried out under a license to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by NPWS.

1.3 Statement of Authority

The bat surveys and subsequent survey report were undertaken and prepared by the following MOR personnel, Mr. Dyfrig Hubble and Ms. Allison Flaherty.

Dyfrig Hubble, Principal Ecologist, has a B.Sc. (Hons) in Tropical Environmental Science and an M.Sc. Environmental Forestry. Dyfrig is a full member of the Chartered Institute of Ecology and Environmental Management. Dyfrig has over 15 years' experience working in the ecological consultancy sector including habitat appraisals and specialist species specific surveys. Dyfrig has extensive experience in undertaking surveys for bats and in the preparation of survey reports for various projects within both the UK and Ireland.

Allison Flaherty, Environmental Consultant, has a B.A. Biology, a M.Sc. Biodiversity and Conservation and over 2.5 years' working experience in the ecological consultancy sector. Allison is a qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and has a specialist interest in bats. Allison has gained extensive experience in undertaking bat surveys and assessments within her role at MOR. Allison has also taken part in specialist bat trainings including; *Introduction to Bat Ecology and Bat Surveys; Bats: Impact Assessment of Development, Mitigation and Enhancements; Bats for Building Professionals; Patterns of Bat Activity at Upland Windfarms: Implications for Sampling and Mitigation;* and *Designing Biodiversity Net Gain for Bats*, all provided by CIEEM course instructors.

1.4 Purpose of Survey Work

The implication of these legislative policies is that the proposed development needs to take account of the potential effects on bats. Survey work is necessary to establish whether the species are currently present in areas where suitable habitat exists and in areas where bats have previously been recorded. Survey work also enables appropriate mitigation measures to

be incorporated into the design of the project and ensures that there are no adverse effects on the conservation status of the species.

Survey work was deemed necessary based on desktop surveys and suitable habitat being identified during the initial walkover of the site.

2 METHODOLOGY

The methodologies used to establish the presence / potential presence of bats are summarised below.

2.1 Desk-Based Studies

A desk-based study was undertaken to identify records of bats within the survey area. The following sources of information were reviewed:

- The National Parks and Wildlife Service (NPWS) website was consulted to obtain the most up to date detail on conservation objectives for the Natura 2000 sites relevant to this assessment (National Parks and Wildlife Service, 2021); and,
- The National Biodiversity Data Centre (NBDC) website was consulted with regard to bat species distributions and bat habitat suitability index (National Biodiveristy Data Centre, 2021).

2.2 Field Based Studies

All surveys conducted followed methodology outlined in the Bat Mitigation Guidelines for Ireland (DoEHLG, 2006), Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (National Roads Authority, 2006) and Bat Surveys for Professional Ecologists Good Practice Guidelines (Collins, 2016).

2.2.1 Dusk Emergence / Activity Survey

Two dusk emergence / activity surveys were undertaken on May 24th and June 8th, 2021 by one (1no.) qualified MOR Ecologist. The surveys commenced 15 minutes before sunset and ended 2 hours after sunset, therefore encompassing the typical emergence times of Irish bat species.

The surveys were designed to cover all accessible vegetated areas within the Site and to determine if any bats were emerging from the mature treeline along the eastern border of the Site and to identify the levels of commuting and foraging within the Site and in particular near the drainage ditch / treeline along the eastern boundary.

An MOR Ecologist surveyed the mature trees along the eastern border that had features suitable for roosting bats. The vantage point survey started 15 minutes before sunset and 1 hour after sunset for each survey. The mature trees were surveyed at a pre-determined vantage point so that they could be monitored for bat emergence (See Figure 2-1).

For the last hour of the survey, the surveyor walked the survey area in a pre-determined transect route (Figure 2-1), noting the time, behaviour (foraging or commuting), location and bat species encountered.

A combination of visual observation and listening to ultrasonic bat calls using an Echo Meter Touch2 Pro (Apple IOS) were used throughout the emergence surveys. Bat calls were recorded digitally using the Echo Meter Tough2 Pro and analysed using appropriate software (KaleidoscopePro) to aid the identification of bat species present. The GPS mapping function was used on the Echo Meter Touch2 Pro (Apple IOS) connected to Apple iPhone-7; this is mapped using Google Earth with a KLM file produced for mapping purposes.

Figure 2-1: Survey Area and Surveyor Locations

2.3 Survey Limitations

All survey work was conducted in accordance with current best practice guidelines. All of the surveys were undertaken when there was no rain or wind, and the temperature was above 10°C. In these weather conditions, bats will not have been deterred from flying and no survey limitations were encountered.

3 RESULTS

3.1 Desk-Based Results

Prior to conducting the field surveys, a desk-based review of information sources was completed.

Pipistrelle species and Daubenton's Bat (*Myotis daubentonii*) have been recorded within a 2km radius of the proposed development area within the past 10 years (National Biodiveristy Data Centre, 2021)

Table 3-1 provides details of the habitat suitability index for the study area (National Biodiveristy Data Centre, 2021). The habitat suitability index identifies the geographical areas that are suitable for individual species. The index ranges from 0 to 100, with 100 being the most favourable to bats. The index presented is for all species combined, in addition to the individual species indices within the study area.

From the indices, it can be established that the study area has an overall moderate habitat suitability index range of 21– 28. The Irish bat species with moderate or moderate-high habitat suitability index for the area include common pipistrelle, brown long-eared bat, soprano pipistrelle and lesser noctule.

However, ca.150m south of the Site is an area of high suitability for bats, ranging from 36.4-58.5 (NBDC, 2021).

Table 3-1: Habitat Suitability Index

Bat Species	Suitability Index Range	Suitability Index Level
All Bat Species	21– 28	Moderate
Soprano Pipistrelle *(Pipistrellus pygmaeus)*	31 - 38	Moderate
Brown Long-eared Bat (*Plecotus auritus)*	39 - 49	Moderate - High
Common Pipistrelle (*Pipistrellus pipistrellus)*	39 - 47	Moderate - High
Lesser Horseshoe Bat (*Rhinolophus hipposideros)*	0 - 4	Very Low
Whiskered Bat *(Myotis mystacinus)*	10 - 20	Low
Daubenton's Bat *(Myotis daubentonii)*	13 - 21	Low
Lesser Noctule *(Nyctalus leisleri)*	38 - 46	Moderate - High
Nathusius' Pipistrelle *(Pipistrellus nathusii)*	16 - 29	Low - Moderate
Natterer's Bat *(Myotis nattereri)*	14 - 26	Low - Moderate

Table 3-2 provides a summary of records of bat species that occur within a 2km grid square of the Site boundary (NBDC, 2021).

Table 3-2: NBDC Bat Species within 2km of the Site

Bat Species			
Daubenton's Bat	*Myotis daubentonii*	19/08/2013	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Pipistrelle	*Pipistrellus pipistrellus sensu lato*	17/07/2011	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Soprano Pipistrelle	*Pipistrellus pygmaeus*	19/08/2013	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV

3.2 Field Based Results

3.2.1 Dusk Emergence / Activity Survey Results

No bats were observed emerging from or re-entering any of the trees surveyed during the vantage point portion of the surveys. The surveys did identify bats commuting along treeline / scrub area to the east and north of the survey area that border the Grange Castle golf course to the east (See Figure 3-1).

The following bats were recorded as a result of the dusk emergence surveys:

- Common pipistrelle, soprano pipistrelle and lesser noctule bats were recorded commuting along the treelines to south and east survey area and the east which border the adjacent Grange Castle golf course. The most frequently encountered species of these were common pipistrelle and lesser noctules. These species are relatively wide-spread and the most commonly encountered species within Ireland;
- Low levels of bat activity were recorded within the Site during both surveys.

- No bats were identified to be roosting within the trees in the survey area; and,
- As very few bats were recorded soon after dusk during the emergence surveys, this indicates that bat roosts are not likely to be present within the immediate local area.

Based on the levels of activity and movement of the bats recorded during the surveys, it is considered that the Site is of little value to bats. During the surveys it was noted that the Site is partially illuminated by street lighting posts from private road, as well as flood lights from the existing buildings and the car park directly northwest. As bats are typically averse to lighting and no commuting or foraging activity was noted within the illuminated areas.

Figure 3-1: Bat Activity Map within the Survey Area

4 IMPACT ASSESSMENT AND MITIGATION

The following bat species have been recorded during the bat surveys: common pipistrelle, soprano pipistrelle and lesser noctule. This represents three of the nine residence bat species known to Ireland, all of which are commonly occurring Irish bat species. All bat species recorded during the bat surveys are Annex IV species under the EU Habitats Directive and all have a favourable status in Ireland.

Bat species within the survey area will potentially be affected by both the construction phase and operational phase of the proposed development. The impact assessment and mitigation will be undertaken in relation to the three bat species recorded within the survey area and the surrounding area: common pipistrelle, soprano pipistrelle and lesser noctules.

4.1 Potential Impacts on Bats

No mature trees will be removed due to the proposed development. The disused wastewater treatment plant located along the eastern boundary will be fully removed as part of the proposed development. There are no structures or vegetation within this area suitable for roosting bats.

Principal impacts of the proposed development, in general, on bats may be summarised as follows:

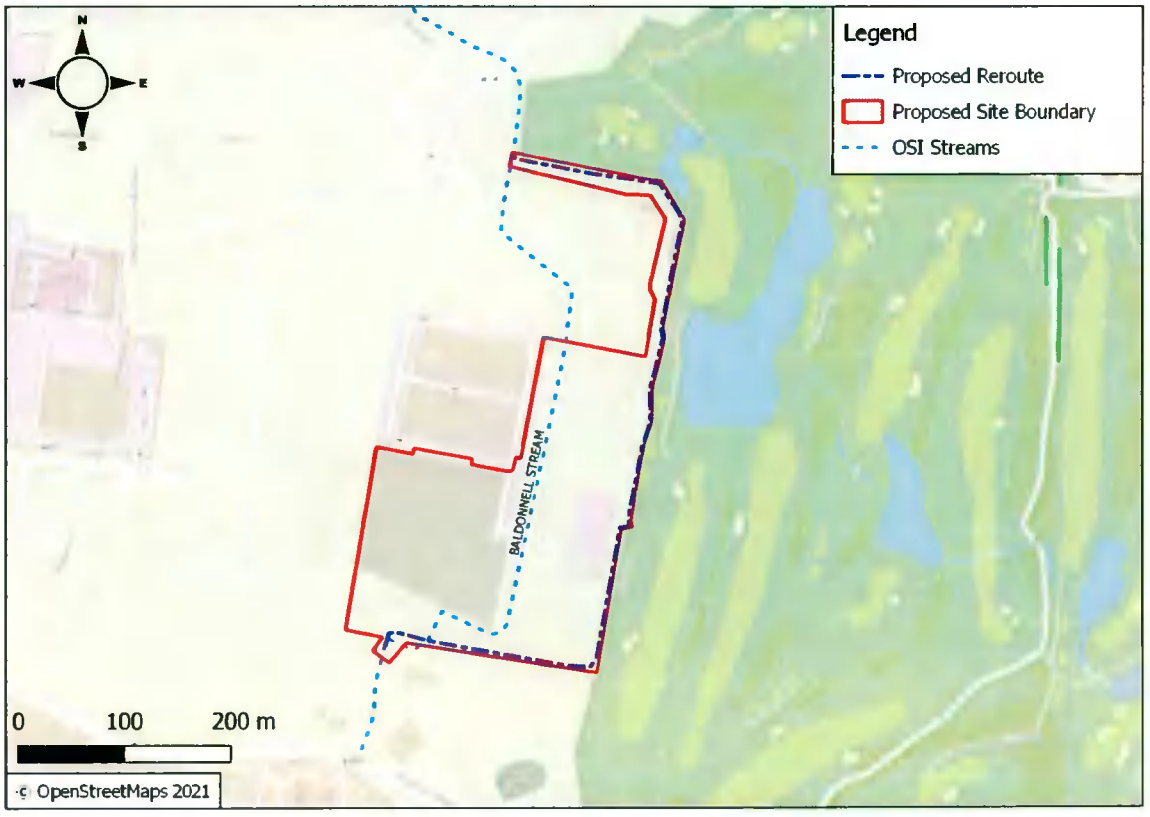
4.1.1 Loss of Habitat

The surveys did not identify any bat roosts within the Site or in the immediate vicinity. However, there is potential commuting and foraging habitats to the east of the Site and within the wider area. Therefore, it is considered that without the appropriate consideration of foraging and commuting bats in close vicinity to the Site, that the proposed development could have a Negative Impact on bat species.

4.1.2 Stream Diversion

The Baldonnell Stream has been previously diverted due to construction of the existing buildings within the Site. The stream currently lies ca.55m west of its mapped position (EPA, 2021), refer to the altered route in Figure 4-1 for the streams approximate position.

Figure 4-1: Proposed Rerouting of the Baldonnell Stream



It is proposed to divert the Baldonnell Stream to the east of the Site, along the existing hedgerow / treeline and drainage ditch near the Grange Castle golf course. This would be the preferred route from a biodiversity perspective as it would enhance the existing ecological corridor and connect into the network of tree lines / hedgerows and waterbodies on the golf course.

This would have a benefit to bats, as parts of the currently positioned Baldonnell Stream are illuminated by artificial lighting and sections of the stream have been culverted. The diversion of the stream further east could allow for a completely dark corridor for bats to utilise the stream to commute and forage over an open watercourse.

4.1.3 Lighting of the General Area (street lighting, security lighting etc.)

Lighting for the proposed development will potentially impact on bat species in relation to commuting and foraging potential within the wider area which is used by lesser noctules and pipistrelles. Common pipistrelles and soprano pipistrelles will tolerate low levels of lighting, however excess lighting is likely to have an impact on bats.

In the absence of an appropriate lighting scheme, it is considered that the proposed development could have a Negative Impact on foraging and commuting bats.

4.2 Mitigation Measures

The following mitigation measures are recommended to reduce the potential impact of the proposed development on local bat populations:

4.2.1 Landscaping Plan

A Landscaping Plan has been developed for the proposed development, which includes for the buffers along the steam diversion, which will provide suitable habitats for bats (Please see Landscape Plan Appendix D of the EcIA).

It is also recommended that the use of chemicals is avoided (weed killers, etc.) within the development zone.

4.2.2 Lighting Plan

Bats are adverse to excessive lighting, subsequently, impacts could occur as a result of an inappropriate lighting strategy. Therefore, it is important that lighting installed for the proposed development will be completed with sensitivity for local wildlife while still providing the necessary lighting for human usage.

The lighting to be installed as part of the proposed development will be for safety and security. Nevertheless, the lighting strategy has also been designed to mitigate against any potential impacts on nocturnal species in line with the Bat Conservation Trust (BCT) Guidelines on '*Bats and Artificial Lighting in the UK*' (BCT, 2018). The lighting strategy avoids excessive lighting. The following measures have been taken into consideration during the lighting layout design:

- Construction will be limited to daylight hours in order to minimise adverse effects on nocturnal fauna;
- Avoidance of excessive lighting;
- Light Emitting Diodes (LED's) will be used, and the brightness will be set as low as possible;
- Lighting will be aimed only where it is needed, with no upward lighting;
- Lighting will be directed away from landscaped areas;
- Lighting lux levels will not exceed 1.0 Lux along most of the diverted Baldonell stream; and,
- Lighting will be turned down / off when not required.

4.2.3 Monitoring

In order to ensure that the works in relation to the proposed development do not have significant impacts on bats, the following construction procedures and mitigation measures should be implemented. These measures are in line with the BCT Guidelines '*Bats and Artificial Lighting in the UK*' (BCT, 2018):

- Following the installation of the lighting for the proposed development, a suitably qualified Ecologist should undertake a further site inspection in order to check the lighting patterns and lux levels along the site boundaries to ensure there are no impacts to bats or other nocturnal species.

5 CONCLUSIONS

The bat surveys undertaken for the proposed development included a walkover of the lands within the survey area and dusk emergence / activity surveys. The walkover identified mature trees along the eastern boundary that could be suitable for roosting bats. These trees will not be removed due to the proposed development. These trees were subject to dusk emergence surveys; however, no bats were observed emerging from these trees and very low levels of bat activity were recorded during the first hour of the surveys.

Based on the low levels of bat activity within the survey area shortly after sunset and right before sunrise, it is considered unlikely that there are bats roosting within the immediate locality of the proposed development. The surveys did identify bats commuting and foraging along sections of the treelines / scrub areas, to the east and north of the Site, which follows the golf course area to the east.

Overall, the Site is considered to be of Low importance for roosting, commuting and foraging bats within the local area as the Site is partially illuminated at night and the Site is located within a built-up environment. However, it is considered that if the mitigation measures presented within this report are followed, the potential impacts on bats will be reduced and the overall impact from the proposed development on bats will be Negligible.

6 REFERENCES

BCT. (2018). *Bats and artificial lighting in the UK Bats and the Built Environment Series.* Bat Conservation Truct & Institute of Lighting Professionals.

Collins, J. (2016). *Bat Surveys for Professional Ecologists - Good Practice Guidelines (3rd ed.).* London: The Bat Conservation Trust.

DoEHLG. (2006). *Bat Mitigation Guidlines for Ireland. Irish Wildlife Manuals, No. 25.* Dublin: Department of Environment, Hertiage and Local Government.

National Biodiveristy Data Centre. (2021). *National Biodiveristy Live Maps*. Retrieved from National Biodiveristy Data Centre: http://maps.biodiversityireland.ie/

National Parks and Wildlife Service. (2021). *National Parks and Wildlife Service*. Retrieved from National Parks and Wildlife Service: https://www.npws.ie

National Roads Authority. (2006). *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes.*

APPENDIX C

Biological Assessment of Baldonnell Stream at Profile Park

May 2021

Prepared by:
Sweeney Consultancy,
Rahan,
Mallow
Co. Cork.
Tel. 022/26780

TABLE OF CONTENTS

1. INTRODUCTION

It has been proposed that the existing channel of a section of the Baldonnell Stream be moved to the east of its current course. Sweeney Consultancy was contracted to assess the ecological condition and biological water quality of the section of channel in question and to comment on the proposed re-routing.

2. METHODOLOGY

Historical mapping was consulted to check the earlier course of the stream. Field surveys were undertaken on 04 May, 2021. The stream habitat quality was assessed, based on its physical nature and ecology. Grid reference of photographs were recorded using a hand-held GPS device and photographs were taken with a digital camera. A pond-net sample was taken at ITM 703847 730198, as indicated in Figure 1 and invertebrates were identified on the bankside to the lowest taxonomic level possible with the naked eye. The biological water quality was assessed following the most recent EPA Standard Operational Procedure for the Q-scheme methodology, which is based primarily on analysis of the aquatic invertebrate fauna.

The habitat quality of a drain along a field boundary to the east, to which it is proposed that the stream be re-routed, was assessed visually.

Fig. 1. Baldonnell Stream

3. RESULTS

The section of the Baldonnell Stream that is proposed to be moved has already been move c. 60m to the east of its original course indicated on the 1847-1842 6" Map, (see Figure 1). The current excavated channel is v-shaped in cross-section and steep-sided (Photo 1, Appendix 1), with shallow flow over gravel, cobble and silt, c. 3m below adjacent ground level. At crossing points, the stream passes through round culverts (Photo 2). Instream vegetation is

typical of small lowland streams of moderate flow, with *Apium nodiflorum* and *Berula erecta* widespread and some *Veronica anagalis-aquatica* and *Veronica beccabunga* also present.

The list of macroinvertebrate taxa identified to the level required for the Q-scheme and relative abundance of each taxon is presented in Appendix 3.

The Q-scheme values range from Q1 (grossly polluted) to Q5 (pristine). Suffixes of /0, indicating a suspected toxic effect, and *, indicating a siltation effect may be added.

At the Baldonnell Stream sampling site, EPA Indicator Group A (Very Pollution Sensitive) is absent, Group B (Relatively Pollution Sensitive) is represented by low numbers of the caddis families Limnephilidae, Lepidostomatidae and Sericostomatidae and the mayfly nymph *Alainites muticus.* Group C (Relatively Pollution Tolerant) dominates the fauna and Group D (Very Pollution Tolerant) is represented by *Asellus aquaticus,* which is common in abundance. Group E (Most Pollution Tolerant) is absent. This faunal community composition indicates a Q-value of **Q3**, which corresponds to Poor Ecological Water Quality, as defined by EPA.

No rare or protected species of flora or fauna was found.

The drainage channel farther to the east (Figure 1), to which the former wastewater treatment plant discharged, was not holding any water at the time of the fieldwork and was overgrown with herbaceous vegetation, mainly nettles, *Urtica dioica,* (Photo 3).

3. CONCLUSIONS AND RECOMMENDATIONS

The section of the Baldonnell Stream in question is currently in an artificially created channel, which was poorly created from an ecological perspective. The habitat quality could be improved by diverting the flow to the drainage channel to the east, where the adjacent hedgerow/treeline would provide mixed shade and allochthonous inputs.

The instream and riparian quality could be further improved by placement of occasional boulders within the channel to create variations in flow type and by stepping the slope between the stream and adjacent land. It any new culverts are to be included, there should be square in cross-section, rather than round.

Overall, re-routing the Baldonnell Stream to the proposed new course will not negatively impact on the aquatic and riparian habitat and could have some significant positive impacts.

APPENDIX 1
PHOTOGRAPHS

Photo 1

Photo 2

Photo 3

APPENDIX 2
INVERTEBRATES RESULTS

Relative abundance expressed as D: Dominant; N: Numerous; C: Common; F: Few; SS: Single Specimen

INDICATOR GROUP	POLLUTION SENSITIVITY/TOLERANCE	TAXON	ABUNDANCE
A	Very Pollution Sensitive	None Recorded	
B	Moderately Pollution Sensitive	Limnephilidae	F
		Lepidostomatidae	SS
		Sericostomatidae	F
		Alainites muticus	SS
C	Moderately Pollution Tolerant	*Polycelis sp.*	F
		Gammarus duebeni	D
		Baetis rhodani	N
		Philopotamidae	F
		Rhyacophila sp.	SS
		Polycentropodidae	F
		Elmis sp.	F
		Chironomidae (ex. *Chironomus*)	C
D	Very Pollution Tolerant	*Asellus sp.*	C
E	Most Pollution Tolerant	None recorded	

APPENDIX D