Ecological Impact Assessment

Clonburris Phase One

AECOM Ecology

Date 22/04/2022

Comhairle Contae
Átha Cliath Theas
South Dublin County Council

1. Introduction

1.1 Background

AECOM was commissioned by South Dublin County Council (SDCC) to produce an Ecological Impact Assessment (EcIA) to inform the Clonburris Phase One planning application for 263 new dwellings, new community facilities and three large open green spaces which forms Phase One of the development of SDCC lands within the approved Strategic Development Zone (SDZ) at Clonburris, South Dublin County (hereafter referred to as the 'Proposed Development'). The Proposed Development is located within the overall Clonburris SDZ at Clonburris, Co. Dublin, which is presented in Figure 1. The location of the Proposed Development (hereafter the 'Site') is presented in Figure 1.

Note that the proposed Clonburris SDZ Road Infrastructure Development (reference SDZ20A/0021) that runs through the south-western section of the Site is not considered as part of the Proposed Development. The Clonburris SDZ Road Infrastructure Development includes road infrastructure works for a new road known as the Clonburris South Link Street. The works proposed to facilitate this proposed road development within the Site boundary will include a watercourse crossing of the Kilmahuddrick Stream and the demolition of existing structures, which are considered separately as part of the Clonburris Road Infrastructure Development. The boundary of the Clonburris Road Infrastructure Development is presented in Figure 1.

The purpose of this EcIA is to provide a detailed appraisal of the potential impacts of the Proposed Development on identified ecological features, which include designated nature conservation sites, habitats, flora and fauna species and ecosystems, and, where necessary, prescribe appropriate and proportionate mitigation measures.

Throughout this EcIA Report, species are given their scientific name on first mention and common name only thereafter. Distances quoted are cited as the shortest boundary to boundary distance 'as the crow flies,' unless otherwise specified.

1.2 Site description

The Ordnance Survey Ireland (OSi) grid reference of the centre of the Site is O 04191 32618 and the Irish Transverse Mercator (ITM) coordinates of the centre of the Site are 704133, 732642. The Site is located in Clonburris, Co. Dublin, which is west of Dublin City Centre. It is located within the overall Clonburris SDZ boundary in the townlands of Kishoge and Grange in Co. Dublin. The Site is located between Lynch's Lane (to the south) and the regional Dublin Kildare/Cork railway line (to the north), and approximately 70 m west of the outer ring road (the R136). The area of the Site is approximately 10 hectares. The Site is generally flat and is at an altitude of approximately 50 to 60 m above sea level.

The dominant existing habitats within the Site are scrub, recolonising bare ground, dry meadows and grassy verges, and buildings and artificial surfaces. There are existing residential developments and outbuildings within the Site. Other smaller areas of habitat include hedgerows, treelines, and mixed broadleaved woodland. The surrounding lands are dominated by grassy fields and residential areas of the wider Lucan, Clondalkin and Liffey Valley communities.

The Kilmahuddrick Stream is located in the west of the Site and is culverted underneath the railway line to the north-west of the Site. It flows north-west into the Griffeen River located approximately 720 m downstream of the Site, followed by the River Liffey which outfalls at Dublin Bay more than 18 km east of the Site downstream (AWN Consulting, 2020). The Grand Canal is located approximately 140 m south of the Site and flows into the Liffey Estuary and Dublin Bay more than 18 km east of the Site.

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1.3 Overview of the Proposed Development

The layout of the Proposed Development is shown on the drawing titled *Masterplan – Site Plan* produced by Metropolitan Workshop.

The Proposed Development for 263 new dwellings, new community facilities and three large open green spaces forms Phase One of the development of SDCC lands within the approved SDZ at Clonburris, South Dublin County. The Proposed Development comprises 129 houses, 16 duplex apartments and 118 apartments in a mix of one to five storey buildings. There is a mixed tenure throughout the scheme with one third social housing provision, one third affordable housing and one third affordable rental.

The community green sits within the heart of the scheme with the larger linear park forming a green spine running north-south to the west of the of development. These open spaces will provide local amenity and wider connections to the Griffeen Valley Park to the west of the site and the Grand Canal to the south. The scheme is also designed as an exemplar SuDS development, utilising a management train of collection, conveyance and treatment that will connect the proposed surface water infrastructure with the wider SDZ network.

The site benefits from close proximity to Kishoge railway station to the north-east with direct links into Dublin city centre and good access to bus routes. A new infrastructural link road, 'The Clonburris South Link Street' runs along the length of the SDZ Lands, bi-secting the Phase One site. This primary Link Street provides a connection between Adamstown and Cappagh. A total of 253 car parking spaces have been provided throughout the scheme, with a parking ratio of 1:0.96 throughout the scheme.

The roads and streets throughout the development also provide cycle connectivity to the existing cycle infrastructure offering key links to Clondalkin, Ronanstown and Adamstown Town Centre. 168 No. cycle spaces are proposed to serve the apartment and duplex units of which 134 No. spaces are secured sheltered spaces for residents and 34 No. spaces provided for visitors.

1.4 Quality assurance

This EcIA was prepared by Laura Cappelli (BSc, MSc (Hons)) Consultant Ecologist with AECOM, reviewed by Sara McBride (BSc (Hons) MCIEEM) Principal Ecologist with AECOM and verified by Paul Lynas (BSc (Hons) MRes PhD CEnv MCIEEM) Associate Director (Ecology) with AECOM.

Laura is a Consultant Ecologist with four years professional experience in the preparation of ecological reports including EcIA to support planning applications for a range of commercial development projects including national road schemes, underground cable connections, residential developments, transport developments, waste to energy projects and waste remediation projects.

Sara is a Principal Ecologist with over 8 years of experience. She is skilled in the production and review of a range of deliverables including EcIA. She has been responsible for such documents relating to nationally important infrastructure, renewable energy, water assets and commercial development projects. Her key skills are protected species ecology (Sara holds bat licences in Ireland, England, and Scotland) and invasive non-native species management.

Paul is an Associate Director of Ecology with over 17 years' professional conservation and consultancy experience in carrying out a range of habitat and species surveys. He has worked on numerous development schemes and ecological assessments from small to large scale, across Ireland incorporating species specific surveys, mitigation design and monitoring. He is skilled in protected habitats and species surveys. He regularly

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surveys a variety of developments from large to small schemes to assess their ecological impacts during their construction and operational phases.

This Report has been completed in line with AECOM's Integrated Management System (IMS). Our IMS places great emphasis on professionalism, technical excellence, its quality as well as covering all aspects of environmental and health and safety management. All staff members are committed to establishing and maintaining our accreditation to the relevant international standards namely BS EN ISO 9001:2008 and14001:2004 and BS OHSAS 18001:2007. In addition, our IMS requires careful selection and monitoring of the performance of all sub consultants and contractors.

2. Legislative and planning context

2.1 Relevant legislation

This Ecological Impact Assessment has been carried out within the context of the following relevant legislation:

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive');
- Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive');
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (as amended) (the 'Water Framework Directive');
- Regulation 1143/2014 of the European Parliament of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species (the 'Invasive Alien Species Regulations');
- Convention on Wetlands of International Importance ('Ramsar Convention');
- The Planning and Development Acts 2000 to 2020;
- European Communities (Bird and Natural Habitats) Regulations 2011 and 2015 (the 'Habitats Regulations');
- The Wildlife Acts 1976 to 2018 and the Wildlife (Amendment) Act 2000 (together known as the 'Wildlife Acts');
- Flora (Protection) Order 2015 S.I 356/2015 (the 'Flora Protection Order'); and,
- EC Environmental Objectives (Surface Waters) Regulations 2009 (SI 272 of 2009).

2.2 Relevant planning policy and guidance

2.2.1 Project Ireland 2020 National Planning Framework (NPF)

The *Project Ireland 2040 National Planning Framework* (NPF) sets out the Government's planning policies for Ireland and how these should be applied. NPF sets out that to achieve sustainable development, the planning system must incorporate an environmental objective, which should include:

- integrated planning for green infrastructure and ecosystem services;
- enhancing the conservation status and improve the management of protected areas and protected species;
- use of natural resources prudently;
- minimising waste and pollution; and,
- mitigating and adapt to climate change, including moving to a low carbon economy.

There is a presumption in favour of sustainable development in NPF.

2.2.2 National Biodiversity Plan 2017 – 2021

The *National Biodiversity Plan 2017 – 2021* for Ireland outlines six main objectives to meet commitments under the Convention on Biological Diversity (CBD) and EU Biodiversity Strategy. These objectives include:

- mainstreaming biodiversity into decision-making across all sectors;
- strengthening the knowledge base for conservation, management and sustainable use of biodiversity;

- increasing awareness and appreciation of biodiversity and ecosystem services;
- conserving and restoring biodiversity and ecosystem services in the wider countryside;
- conserving and restoring biodiversity and ecosystem services in the marine environment;
- expanding and improving management of protected areas and species; and,
- strengthening international governance for biodiversity and ecosystem services.

2.2.3 South Dublin County Council Development Plan 2016 – 2022

The *South Dublin County Council Development Plan 2016 – 2022* sets out the aims, policies, and objectives for topics such as development, green infrastructure, natural heritage for South Dublin County.

Several objectives are relevant to biodiversity and the Proposed Development, including:

- C12 Objective 2 – maximise the leisure and amenity resources offered through promotion of Management Plans that provide for the continued improvement of the park setting, biodiversity and recreational facilities;
- IE2 Objective 9 – protect waterbodies and watercourses from inappropriate development, which will include protection buffers in riverine and wetland areas;
- IE7 Objective 5 – ensure external lighting schemes minimise light spillage or pollution and do not adversely impact biodiversity in the surrounding areas;
- G1 Objective 1 – establish a coherent, integrated and evolving Green Infrastructure network across South Dublin County with parks, open spaces, hedgerows, grasslands, protected areas, rivers, and streams;
- G2 Objective 2 – protect and enhance the biodiversity value and ecological function of the Green Infrastructure Network;
- G2 Objective 4 – repair habitat fragmentation and provide for regeneration of flora and fauna where weaknesses are identified in the network;
- G2 Objective 9 – 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 – seek to control and manage non-native invasive species;
- G3 Objective 2 – 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; and,
- G5 Objective 1 – 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.

2.2.4 Clonburris SDZ Planning Scheme

The *Clonburris SDZ Planning Scheme* (Minogue and Associates Ltd., 2017) sets out development objectives for the Clonburris area.

Strategic environmental objectives and recommendations in the *Clonburris SDZ Planning Scheme* relevant to the Proposed Development include the following:

- Biodiversity – sustain, enhance, or where relevant prevent the loss of ecological networks or parts thereof which provide significant connectivity between areas of local biodiversity;

- Biodiversity – safeguard and improve the quality, character and continuity of the Grand Canal (proposed Natural Heritage Area (pNHA)) and facilitate the protected species, biodiversity, and its contribution to a fully functioning green infrastructure network;
- Biodiversity – maintain continued ecological integrity of hedgerow and treeline habitat linking the Grand Canal corridor and the Kildare Rail corridor. Where these hedgerows cannot be retained, a new hedgerow network composed of the same species shall be planted along roadways within the development;
- Biodiversity – external lighting should be downlighting and should be time limited where possible. Lighting should be avoided in sensitive wildlife areas and light pollution in general should be avoided;
- Biodiversity – a method statement for the construction, planting regime and species selection of both 'dry' and 'wet' hedgerows shall be provided with all planning applications for developments within 10 m of existing hedgerows along the barony boundary, the Grand Canal, the Griffeen River, and the Kilmahuddrick Stream;
- Biodiversity – an ecological assessment will be required for development proposals that have the potential to impact on environmentally sensitive sites in particular within 30 m of the Kilmahuddrick Stream;
- Biodiversity – an Invasive Species Management Plan should be prepared to prevent the introduction of any new species of alien invasive plants to the site, prevent the movement and spread of existing alien invasive plants on site, and eradicate any populations of invasive alien plan species on site;
- Water – maintain and improve, where possible, the quality of rivers, lakes and surface water including the Grand Canal, Griffeen River, and streams within the Clonburris SDZ Planning Scheme;
- Water – design SuDS to facilitate ecological improvement and enhancement where possible;
- Soil and geology – maintain hydrological integrity of wetlands;
- Soil and geology – maintain productive capacity and prevent erosion of soils;
- Climate change – integrate climate change adaptation to the Clonburris SDZ Planning Scheme;
- Green infrastructure – support green infrastructure measures through the Planning Scheme where possible;
- Green infrastructure – retain and improve key landscape and ecological features such as hedgerows, the Grand Canal, and the Griffeen River;
- Green infrastructure – support native plant and animal species and encourage corridors for their movement; and,
- Landscape – achieve ecological enhancement and connectivity of ecological corridors, such as the railway ecological corridor.

2.2.5 Clonburris SDZ Biodiversity Management Plan

The *Biodiversity Management Plan to Inform the Parks and Landscape Strategy of Clonburris SDZ* (Scott Cawley, 2020a) sets out biodiversity actions for the Clonburris SDZ.

Biodiversity actions relevant to the Proposed Development include the following:

- HR01 – retain habitats of ecological value where feasible with particular consideration to ecological features which provide connectivity between habitats (e.g. hedgerows and treelines). Retention of townland boundary

hedgerows within open space should be given priority;

- HR02 – where hedgerows, treelines, woodland and other semi-natural habitats are being retained, details of their management and protection should be provided in a Habitat Management Plan as planning documentation;
- HR04 – prior to any works, watercourses will be fenced off at a minimum distance of 10 m from the watercourse bank in order to maintain a biodiversity protection zone;
- HR06 – no storage/stockpiling of materials or machinery or construction works activities (except for those required to construct footpaths or bridges) will be undertaken within 50 m of the Grand Canal and Griffeen River. Where construction works will take place within 50 m of a watercourse, a risk assessment must be carried out to determine if a Construction Environmental Management Plan (CEMP) will be required;
- HR07 – where other works (e.g. footpath maintenance) must take place within 10 m of the edge of a watercourse a risk assessment should be carried out to determine if a CEMP will be required. If a risk is identified the CEMP must be developed in consultation with Inland Fisheries Ireland at application stage where feasible;
- HR08 – where meadows (GS2) are to be retained within the areas of open space, particular consideration should be given to retain this habitat around other features of ecological importance such as hedgerow, water features, and scrub;
- HR10 – where woodland or individual trees are being retained, the root protection zone/area must be calculated by a qualified arborist and protective barriers for root protection should be installed;
- HR11 – particular consideration must be given to retaining woodland which provides ecological connectivity to other habitats of ecological importance and strengthens the green and blue infrastructure network;
- HR16 – where hedgerows are proposed for retention, management measures should be set out appropriate to their location and function and in accordance with the Heritage Council guidance for conserving hedgerows (Heritage Council, 2016). Management must also include the removal of non-native invasive species and filling in sparse patches with native species planting;
- HC01 – planting schedules for all areas within the lands should include predominately native species, and non-native species should be limited to specific areas;
- HC02 and HC03 – no invasive species will be planted on the lands;
- HC04 – where native species planting is not feasible, planting schedules should provide biodiversity value to pollinators and other fauna species;
- HC06 – proposed wildflower meadows should reflect the native existing biodiversity in the area;
- HC11 – green roofs are recommended to improve biodiversity value and as a SuDS measure;
- HC15 – hedgerows within park areas should be planted for key habitat creation. Species must be composed of a range of native species that are also present locally;
- HC17 – retain and plant hedgerows to connect features such as the Griffeen River, the Grand Canal, the railway line and existing hedgerows, treelines and woodland;
- HC20 – for every tree felled within the Clonburris SDZ, a replacement tree must be planted;
- HC30 – new wetlands should be created with biodiversity in mind. Retention and attenuation ponds should have shallow, gently sloping areas

to create suitable habitat for amphibians and other fauna;

- HC32 – a buffer zone of native habitat including trees such as willow, ash and birch should be planted around new wetlands. Plant species found in marsh and wet grassland habitat can be planted to mimic a natural habitat around new wetlands;
- HC36 – planting schedules along the railway line should have regard to habitat creation recommendations provided in the All-Ireland Pollinator Plan;
- Bi02 – existing grassland habitats should be retained or created where possible and left uncut during the winter months to provide a continuous food source for seed-eating birds;
- Bi04 and Bi05 – all proposed developments within Clonburris SDZ must consider including nest boxes or bricks for swallows, house martins and swifts. Nest boxes should be installed within the parks to accommodate a range of different species (e.g. for raptors, large birds, small birds, etc.);
- BiM01, BiM02 and BiM03 – breeding birds, barn owl and kingfisher should be monitored annually to assess the impacts of the development;
- Ba02 – all proposals for development near bat roosts or ecological corridors must address the potential adverse impacts of lighting on bats;
- Ba04 and Ba04 – any developments located close to a known bat roost or ecological corridor should consider incorporating enhancement measures, such as installing bat boxes, planting hedgerows and creating ponds. All proposed developments within Clonburris SDZ must consider installing bat bricks into the building's design;
- M01 – mammal surveys must be carried out within the proposed development site and up to 150 m around the boundary to ensure no protected mammals are negatively impacted;
- I02 – installation of 'insect hotels' should be considered throughout the site;
- IM01 – long-term annual monitoring of aquatic habitats (the Grand Canal, feeder streams, and the Griffeen River) for white-clawed crayfish within the Clonburris SDZ should be undertaken;
- FA01 – should any areas of permanent or significant semi-permanent standing water require infilling they must be first checked by a suitably qualified ecologist for presence of fish, newts, and frogs or evidence of their breeding. If required, a licence permitting their removal should be applied for from the NPWS and translocated to suitable alternative habitat within the SDZ (i.e. the proposed attenuation ponds);
- Kishoge South-west – provide significant and integrated SuDS infrastructure, including a high amenity retention pond/lake; and,
- Kishoge South-west – appropriate pedestrian access points to the Grand Canal to be sensitive designed in accordance with the Parks and Landscape Strategy and Biodiversity Management Plan.

The above planning policies and biodiversity actions have been considered when assessing potential ecological constraints and opportunities identified by this study and when assessing requirements for further survey, design options and ecological mitigation, as described in Section 5.

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3.1 Target ecological features

For the purposes of the desk study, the target features of this EcIA comprised:

- designated or proposed nature conservation sites at international, national and local levels;
- habitats and species listed on Annexes I and II respectively of the Habitats Directive, which listing indicates importance in a European context and affords protection if designated as Qualifying Interests (QI) of SAC;
- species listed on Annex IV of the Habitats Directive, which are known as European Protected Species and are subject to strict protection anywhere they occur;
- species listed on Annex I of the Birds Directive, which listing indicates importance in a European context and affords protection where designated as Special Conservation Interest (SCI) of SPA;
- species listed on the Wildlife Act 1976 and the Wildlife (Amendment) Act 2000 (together known as the 'Wildlife Acts');
- fish species and habitats protected under the Fisheries Consolidation Act 1959 (No. 14 of 1959), as amended, the Inland Fisheries Act 2010 (No. 10 of 2010) as amended, and the Local Government (Water Pollution Acts) 1977-1990, as amended;
- plant species listed on the Flora (Protection) Order, 2015 (S.I. No. 356/2015) (hereafter 'the Flora Protection Order');
- species and habitats listed on the National Biodiversity Action Plan 2017 - 2021;
- species that are Nationally Rare, Nationally Scarce or listed in Red Data Lists, which are published by the National Parks and Wildlife Service (NPWS) in collaboration with relevant Northern Irish agencies (e.g. Marnell *et al.*, 2019; Regan *et al.*, 2010, King *et al.,* 2011, Lockhart *et al.*, 2012, Nelson *et al.*, 2011; Nelson *et al.*, 2019; Colhoun and Cummins, 2013; Wyse-Jackson *et al.*, 2016);
- Birds of Conservation Concern in Ireland (BoCCI) red-listed and amber-listed birds Gilbert *et al.*, 2021); and,
- invasive non-native species of plants and animals listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) (as amended) (hereafter 'scheduled invasive species'), those of EU concern under the EU Invasive Alien Species Regulation, and those listed by the National Biodiversity Data Centre as invasive in Ireland.

Other species or habitats (e.g. those not currently subject to legal protection, or included within policy), that may be rare, scarce or otherwise notable, are included where deemed appropriate through available information and/or professional judgement. Note that in the relevant CIEEM EcIA guidance (2018) it is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened, and resilient to impacts and will remain viable and sustainable.

Note that the South County Council Development Plan states that Natural Heritage Area (NHA) are afforded national protection and lists proposed NHA (pNHA) as examples of protected sites. It also states that it is the policy of the council to protect pNHA, which are part of the Green Infrastructure network. Additionally, NPWS state that pNHA are subject to limited protection including "*Recognition of the ecological value of pNHAs by Planning and Licencing Authorities*." Both NHA and pNHA are therefore included as ecological features in this assessment.

3.2 Zone of influence

The 'zone of influence' (ZoI) of the Proposed Development is the area over which ecological features may be subject to significant effects as a result of its construction, operation, and/or associated activities. The

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ZoI can extend beyond the boundary of the Proposed Development Site, for example where there are hydrological links extending beyond the Site boundary.

As recommended by CIEEM (2018), professionally accredited or published studies have been used to determine ZoI. The ZoI will vary for different ecological features depending on their sensitivity to any identified impact.

Table 1 sets out the adopted zones of influence of the Proposed Development on relevant ecological features. For the purposes of the desk study, the target features of this EcIA comprised:

- review of professionally accredited and/or published literature;
- professional judgement; and,
- the results of baseline desk study and field survey carried out for the Proposed Development.

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Table 1. Zone of influence of Proposed Development for relevant ecological features

Ecological feature	Adopted zone of influence	Rationale
International nature conservation designations (e.g. European sites)	15 km and/or where a 'source-pathway-receptor' exists	The Office of the Planning Regulator (OPR, 2021) states that "*the zone of influence of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European Site. This should be established on a case-by-case basis using the Source-Pathway-Receptor framework*".
National statutory nature conservation designations	2 km and/or where a 'source-pathway-receptor' exists	Given the relatively minor nature of the Proposed Development, there are unlikely to be any impact pathways which could adversely affect sites more than 2 km distant.
Habitats and plants	Site boundary and downstream catchment of Site	Direct impacts on habitats and plants are restricted to the footprint of the Proposed Development. Indirect pollution impacts could occur on habitats and plant species with relatively high surface-water dependency relative to terrestrial habitats (e.g. watercourses, mudflats, saltmarsh, reefs). Indirect pollution impacts are unlikely to occur on habitats and plant species with relatively high ground-water dependency relative to terrestrial habitats (e.g. turloughs and petrifying springs) given that the Proposed Development will not result in any changes to groundwater conditions.
Bats	50 m	It is generally accepted that disturbance of most roosting bats from typical construction activities is unlikely to occur beyond 50 m from source and that this can be considerably lower for minor works. The main impacts from the Proposed Development on foraging and commuting bats will be habitat loss and fragmentation. These impacts will be localised to the Site and are unlikely to affect bats beyond 50 m.
Otter *Lutra lutra*	150 m	Disturbance of otter from construction works is only likely to extend up to a distance of 150 m for any holts at which breeding females or cubs are present, and 20 m for active non-breeding otter holts (NRA, 2008).
Badger *Meles meles*	150 m	Disturbance of any active badger setts during the breeding season (December to June inclusive) from construction works is only likely to extend up to a distance of 150 m where blasting or pile driving will occur or up to 50 m where other works will occur. Furthermore, disturbance to setts during the non-breeding season is only likely to extend up to a distance of 30 m (NRA, 2006).
Other mammals	Site boundary	Other mammals could be impacted by habitat loss and susceptible to mortality during construction and/or operation of the Proposed Development. Significant disturbance effects are assumed to be unlikely beyond the Site boundary.
Amphibians	Waterbodies within 250 m of the Site and downstream catchment of the Site	Based on the NRA (2009a) guidance, amphibians could be impacted within 250 m of the Site where suitable waterbodies are present. Furthermore, any pollutants from the Proposed Development could impact watercourses and thus impact amphibians present within or downstream of the Site.
Reptiles	Site boundary	Reptiles could be impacted by habitat loss and susceptible to mortality during construction of the Proposed Development. Significant

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Ecological feature	Adopted zone of influence	Rationale
		disturbance effects are assumed to be unlikely beyond the Site boundary.
Birds	100 m	Nesting birds including any singing males could potentially be affected by habitat loss or noise from the Proposed Development. Non-breeding birds could also be impacted by construction and/or operation-related disturbance. Significant disturbance effects are assumed to be unlikely beyond 100 m of the Site.
Fish	Watercourses within the Site boundary and the downstream catchment of the Site	Any pollutants from the Proposed Development could impact watercourses and thus impact fish present within or downstream of the Site.
Invertebrates (terrestrial)	Site boundary	Terrestrial invertebrates, such as butterflies, could be impacted by direct habitat loss or injury. However, no habitat loss or direct injury is predicted beyond the Site boundary.
Invertebrates (aquatic)	Watercourses within the Site boundary and the downstream catchment of the Site	Any pollutants from the Proposed Development could impact watercourses and thus impact aquatic invertebrates present within or downstream of the Site.
Invasive non-native species	50 m	The Proposed Development could cause the spread of invasive non-native species within the Site boundary or immediate vicinity of the Site. The zone of influence is unlikely to be greater than 50 m from the Site.

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3.3 Consultation

A meeting with the Heritage Officer at SDCC, Rosaleen Dwyer, was conducted on 13 April 2021. She advised that the Proposed Development should be cognisant of the wider Clonburris Masterplan and Clonburris SDZ Biodiversity Management Plan, in particular considering the ecological networks that connect areas of local biodiversity across the Site. She also advised that hedgerows may be species diverse and should be surveyed during the optimal botanical survey season. She emphasised the need to protect environmental sensitive sites such as the Grand Canal and the Kilmahuddrick Stream. She advised that the ecological integrity of hedgerow and treeline habitat linking the Grand Canal corridor and the railway corridor should be maintained. She also recommended planting a new hedgerow network composed of local native species along roadways within the Site.

Consultation letters were submitted to the following organisations on 19 April 2021: NPWS, Bat Conservation Ireland (BCI), BirdWatch Ireland (BWI), and Inland Fisheries Ireland (IFI). These consultees were invited to make observations and provide comments in relation to the Proposed Development in the context of biodiversity, provide baseline ecological information, and raise any ecological sensitivities that should be considered during the preparation of this EcIA.

A “Report of Heritage Officer” (dated 05 April 2022) was received and a second meeting with Rosaleen Dwyer conducted on 07 April 2022. As a result of her Report and the meeting, a number of concerns were raised and discussed in relation to impact assessment, valuation of ecological features, and alignment of the Proposed Development to the Clonburris SDZ Planning Scheme and Biodiversity Management Plan. To address the comments raised, amendments to this Report were made.

No other consultation responses have been received.

3.4 Desk study

A desk study was carried out to identify relevant nature conservation designations, and records of protected and notable habitats and species potentially relevant to the Proposed Development.

The desk study areas were defined using a stratified approach based on the ZoI of the Proposed Development on different ecological features.

Accordingly, the desk study sought to identify:

- international nature conservation designations (e.g. SACs and SPAs) within 15 km of the Site;
- national statutory nature conservation designations within 2 km of the Site;
- local nature conservation designations within 2 km of the Site; and,
- records of protected and notable habitats and species within 2 km of the Site.

The desk study was carried out using the sources detailed in Table 2.

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Table 2. Desk study data sources

Data source	Date accessed	Data obtained
Environmental Protection Agency (EPA) maps website (https://gis.epa.ie/EPAMaps/)	12/02/2021	• International statutory designations within 15 km. • Other statutory designations within 2 km. • Local nature conservation designations within 2 km. • Information on watercourses, water quality, soils, and geology.
NPWS Protected Sites in Ireland website (https://www.npws.ie/protected-sites)	12/02/2021	• Details on relevant statutory and non-statutory designations.
NPWS map viewer (http://webgis.npws.ie/npwsviewer/)	12/02/2021	• Biological records within 2 km.
National Biodiversity Data Centre (NBDC) (https://maps.biodiversityireland.ie/)	12/02/2021	• Biological records within 2 km. • High Risk invasive species in Ireland.
The Status of EU Protected Habitats and Species in Ireland (Article 17 Report) (https://www.npws.ie/publications/article-17-reports/article-17-reports-2019)	12/02/2021	• Information on the status of EU protected habitats and species in Ireland.
Irish Red Lists (e.g. Marnell *et al.*, 2019; Regan *et al.*, 2010, King *et al.,* 2011, Lockhart *et al.*, 2012, Nelson *et al.*, 2011; Nelson *et al.*, 2019; Gilbert *et al.*, 2021; Wyse-Jackson *et al.*, 2016)	12/02/2021	• Conservation status of plants, amphibians, reptiles, freshwater fish, invertebrates, birds and terrestrial mammals (including bats).
Ordnance Survey Ireland maps and aerial photography (https://www.osi.ie/)	12/02/2021	• Habitats and connectivity relevant to interpretation of planning policy and potential protected / notable species constraints.
National Inventory of Architectural Heritage (https://www.buildingsofireland.ie/)	12/02/2021	• Information on historical structures in the local area.

As noted above, extensive ecological studies have previously been carried out to inform the wider Clonburris SDZ and other specific developments within the area. Any such data relevant to the Proposed Development has been interrogated and is presented in Section 4.

The availability of this existing data reduced the need for further field work to inform this assessment, which was largely limited to a ground-truthing exercise to confirm the data presented in the below sources. Table 3 details the studies referenced, and the area covered by each study.

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Table 3. Existing ecology studies referenced

Report title	Ecology survey date (for report issue date see column 1)	Data obtained	Area of relevance
Clonburris SDZ Planning Scheme: Strategic Environmental Assessment. Final Environmental Report. South Dublin County Council (Minogue and Associates Ltd., 2017)	2015	Environmental data and recommendations for the Clonburris SDZ. Habitat data for the Clonburris SDZ lands from FERS (2015) were ground-truthed in 2017 in this report.	Entire Clonburris SDZ lands (encompassing the Site, see Figure 1).
Clonburris SDZ Planning Scheme: Surface Water Strategy. South Dublin County Council (JBA, 2017)	2017	Data on surface water and watercourses for the Clonburris SDZ.	Entire Clonburris SDZ lands (encompassing the Site)
Clonburris SDZ Planning Scheme: Provision of Information for Screening for Appropriate Assessment. South Dublin County Council (Scott Cawley, 2017)	n/a	Appropriate Assessment (AA) Screening conclusions for the Clonburris SDZ.	Entire Clonburris SDZ lands (encompassing the Site)
Ecological Survey of Clonburris Strategic Development Zone, Clondalkin, Co. Dublin (FERS, 2018)	2015/ 2018	Ecology data for the Clonburris SDZ from surveys carried out in 2015 and 2018.	Entire Clonburris SDZ lands (encompassing the Site)
Clonburris SDZ Ecological Survey Report (FERS, 2015)	2015	Ecology data for the Clonburris SDZ from surveys carried out July to September 2015.	Entire Clonburris SDZ lands (encompassing the Site)
Assessment of Bat Usage of the Grand Canal between Hazelhatch Bridge and the 12th Lock Bridge (Adamstown) (FERS, 2016a)	2016	Results of bat survey for the Clonburris SDZ carried out June to September 2016 along the Grand Canal.	Grand Canal (south of the Site)
Survey for the Occurrence of Otter along the Grand Canal between the 12th Lock Bridge and Hazelhatch Bridge (FERS, 2016b)	2016	Results of otter survey for the Clonburris SDZ carried out June, August, and September 2016 along the Grand Canal.	Grand Canal (south of the Site)
Winter Bird Survey of Clonburris SDZ. South Dublin County Council (Roughan and O'Donovan, 2020)	2020	Wintering bird survey results for the Clonburris SDZ lands from surveys carried out January to March 2020.	Entire Clonburris SDZ lands (encompassing the Site)
Biodiversity Management Plan to Inform the Parks and Landscape Strategy of Clonburris SDZ, Clonburris, Co. Dublin (Scott Cawley, 2020a)	n/a	Guidance, design and management recommendations for the Clonburris SDZ.	Entire Clonburris SDZ lands (encompassing the Site)
Outline Invasive Species Management. Clonburris SDZ,	2019/ 2020	Invasive species data and recommendations for the Clonburris SDZ based on walkover surveys	Entire Clonburris SDZ lands (encompassing the Site)

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Report title	Ecology survey date (for report issue date see column 1)	Data obtained	Area of relevance
Clonburris, Co. Dublin (Scott Cawley, 2020b)		carried out in July 2019 and July 2020.	
Review of Ecological Data Relevant to Clonburris SDCC Masterplan Lands, South County Dublin (Kelleher Ecology Services Ltd., 2019a)	2019	Ecological desk study results and recommendations for the SDCC masterplan area.	SDCC masterplan area (within Clonburris SDZ lands and partially encompassing the Site, see Figure 1)
Screening Assessment for Clonburris SDCC Masterplan Lands, South County Dublin (Kelleher Ecology Services Ltd., 2019b)	n/a	AA Screening conclusions for the SDCC masterplan area.	SDCC masterplan area (within Clonburris SDZ lands and partially encompassing the Site)
Appropriate Assessment Screening Report for Road Infrastructure Development at Clonburris SDZ, Co. Dublin. Clonburris Infrastructure Limited (Scott Cawley, 2020c)	n/a	AA Screening conclusions for the Clonburris SDZ Road Infrastructure Development.	Clonburris SDZ Road Infrastructure Development (within Clonburris SDZ lands and traverses the Site, see Figure 1)
Hydrological and Hydrogeological Qualitative Risk Assessment for Clonburris Infrastructure Development at Clonburris SDZ, Co. Dublin (AWN Consulting, 2020)	n/a	Hydrological data and watercourse locations for the Clonburris SDZ Road Infrastructure Development, the Site, and the wider Clonburris SDZ.	Clonburris SDZ Road Infrastructure Development (within Clonburris SDZ lands and traverses the Site)
Environmental Impact Assessment Report. Roads and drainage infrastructure works as approved under the Clonburris SDZ Planning Scheme (2019) (Stephen Little and Associates, 2020)	2020	Environmental data for the Clonburris SDZ Road Infrastructure Development. Ecological data from the Biodiversity Chapter of the EIAR for the Site and wider Clonburris SDZ lands from field survey carried out in October, November, June, July, and August 2020.	Clonburris SDZ Road Infrastructure Development (within Clonburris SDZ lands and traverses the Site)
Habitat Management Plan. Road Infrastructure Development at Clonburris Strategic Development Zone, Clondalkin, Dublin 22 (Scott Cawley, 2020d)	n/a	Actions and objectives regarding habitats and invasive plants for the Clonburris SDZ Road Infrastructure Development.	Clonburris SDZ Road Infrastructure Development (within Clonburris SDZ lands and traverses the Site)

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Report title	Ecology survey date (for report issue date see column 1)	Data obtained	Area of relevance
Arboricultural Report. Clonburris Infrastructure Works. Clonburris, Co. Dublin (Tree File Ltd., 2020) and Arboricultural Survey Report. Clonburris SDCC Masterplan Lands (CMK, 2020)	n/a	Information on hedgerows and treelines within the Site and the wider Clonburris SDZ lands.	Clonburris SDZ Road Infrastructure Development (within Clonburris SDZ lands and traverses the Site)
Appropriate Assessment Screening Report. Clonburris Phase One. Clonburris Strategic Zone Development, Co. Dublin (AECOM, 2022a)	n/a	AA Screening conclusions for the Proposed Development.	The Site

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3.5 Field survey

The scope of survey for this EcIA was determined based on a review of aerial images and previous ecological survey data available from the area of the scheme (see Table 3). Given the large volume of relevant, recent baseline ecological survey data collected for the Proposed Development area, a full suite of detailed surveys was considered unnecessary (particularly in view of Health and Safety concerns regarding access the Site, especially at night). Rather, a general ecological walkover 'ground-truthing' survey was carried out on 14 April 2021 in accessible areas of the Site to confirm and/or update desk study data. The walkover survey involved an inspection of habitats and a general assessment of the potential for those habitats to support protected species (e.g. bats, otter, and badger) or other features such as invasive non-native species. A further botanical survey was carried out on 20 August 2021. The bat roost suitability of all trees and buildings within the boundary of the Site was also assessed following guidance from Collins (2016). Any evidence of protected, notable, or invasive species were also recorded.

Survey data were collected with the Collector for ArcGIS application on Android tablets. Habitats are described in this Report according to *A guide to Habitats in Ireland* (Fossitt, 2000) and nomenclature for plant species follows that of Stace (2019).

Laura Cappelli BSc (Hons) MSc is a Consultant Ecologist with over four years' professional experience carrying out a range of ecological surveys for terrestrial and wetland habitats and protected species including amphibians, mammals, and bats. Bat surveys that she has carried out includes preliminary roost assessments, walked activity transects, bat roost emergence/re-entry surveys, bat tracking surveys and static detector surveys. Furthermore, Laura has carried out habitat, rare and invasive species, wintering and breeding bird, smooth newt, common frog, badger and otter surveys for a wide range or residential and commercial projects. Laura is also proficient in the use of GIS.

Alison Donnelly BSc (Hons) MSc is a Consultant Ecologist with four years' professional experience surveying on a range of commercial and residential infrastructure projects. Alison's survey experience ranges from marine to terrestrial habitats varying from deep sea pelagic fish abundance assessments to wintering bird surveys. Alison's primary expertise involves surveying for protected species including birds, bats, amphibians and mammals. Alison has carried out a range of breeding and non-breeding bird surveys for raptors, waterbirds, migratory waterfowl and coastal species. Furthermore, Alison has also conducted habitat, rare and invasive species, otter, badger, and smooth newt surveys, as well as assessing trees and structures for bat roosts, completing bat emergence/re-entry and walked activity transect surveys.

3.6 Ecological Impact Assessment

The method employed for assessment of impacts on ecological features is that recommended by the Chartered Institute of Ecology and Environmental Management (CIEEM) in *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018). CIEEM is the leading professional membership body for ecologists in both the UK and Ireland. It provides advice to government upholds standards in professional conduct and promotes best practice. Guidance in CIEEM (2018) broadly agrees with guidance in EPA (2017) and guidance issued by National Roads Authority (NRA, 2009b) (now TII). The latter is commonly used in Ireland and provides detail on the use of a geographical scale of importance, which broadly concurs with CIEEM guidance.

The assessment first establishes the baseline conditions which are determined by obtaining data on potentially affected ecological features through targeted desk study and field survey as described above. The baseline is described both at expected Proposed Development

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commencement and, for comparison, at a future point in the absence of the Proposed Development. The following steps are then employed.

Importance of ecological features

An ecological feature is a site, habitat, or species with nature conservation importance. Only those ecological features that are 'important' and could be significantly affected by the project require detailed assessment. This approach was informed by relevant EcIA guidance whereby "*it is not necessary to carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened, and resilient to project impacts and will remain viable and sustainable*" (CIEEM, 2018). This is consistent with the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) which requires investigation of *likely significant effects*, as accordingly emphasised by EPA (2017). NRA (2009b) prescribes a similar approach, stating that ecological features of less importance than Local (Higher) should not be subject to detailed assessment.

Though other species not considered 'important' in terms of legislation or policy (e.g. fox *Vulpes vulpes,* or common forb species), such species do contribute to biodiversity and have intrinsic value to a site and an overall ecosystem. That being said, no additional ecological features (above those which are considered in this Report) were scoped into the assessment as 'important' either because they are not locally rare, or do not enable effective conservation of other important features.

Existing data and criteria (e.g. Irish Red List status) are considered when determining the importance of ecological features. Where these are lacking, it is necessary to apply professional judgement. Factors considered include:

- rarity, endemicity, mobility and geographic range (particularly if this is changing);
- size/extent, rate of decline and vulnerability;
- typicalness, species-richness, habitat structure and connectivity/fragmentation;
- function/value to other features (e.g. habitats of notable species or buffers against impacts); and,
- restoration potential.

Requirements to comply with legislation are stated during the assessment, but legislative protection and priority listing does not necessarily translate to importance. For example, a transitory roost of a single bat would not be afforded the same importance as a regularly occurring maternity roost (although legal obligations must still be met), and areas of priority habitat could be unfavourably small or in poor condition (e.g. low species diversity, or overrun with invasive plant species) and not practically restorable.

The importance of ecological features is described within a geographic scale. Examples of the types of ecological features which might fall into the importance categories are given in Table 4, which is adapted from CIEEM (2018) and NRA (2009b). For the purposes of this assessment 'Local (local higher)' is the area within 5 km of the site.

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Table 4. Importance of Ecological Features

Importance[1]	Examples
International (very high)	Internationally designated nature conservation site (or candidate/proposed international site), or site satisfying criteria for such designation, or feature essential to maintaining such sites. Sustainable area (or part of a larger sustainable area) of best examples of Annex I habitat[2]. A regularly-occurring internationally-significant population (e.g. 1% of the national population, or potentially less for critical parts of wider populations or those at a critical life-cycle stage) of internationally important species listed on Annex I of the Birds Directive or Annex II of the Habitats Directive.
National (high)	Nationally designated nature conservation site (or proposed such site), or site satisfying criteria for such designation. Sustainable area of good quality Annex I habitat not deemed to be of international importance, or of national priority habitat, which is a significant proportion of the resource. Regularly-occurring nationally significant population (e.g. 1% of the national population, or potentially less for critical parts of wider populations or those at a critical life-cycle stage) of species listed or protected under the Wildlife Acts or Red Data lists, or site supporting one.
County (medium)	County designated nature conservation site (or proposed such site). Sustainable area of Annex I habitat or national priority habitat not deemed to be of higher importance (e.g. lower quality, highly fragmented, small and/or low restoration potential), or priority habitat under a Local Biodiversity Action Plan if this exists and applies at county level. Regularly-occurring county significant population (e.g. 1% of county resource, or potentially less for critical parts of wider populations or those at a critical life-cycle stage) of species listed or protected under the Habitats/Birds Directives, Wildlife Acts, Red Data lists or Local Biodiversity Action Plan (if this exists and applies at county level), or site supporting one.
Local (local higher)	Priority habitat of insufficient size or quality for higher importance or degraded with low restoration potential. Habitat providing significant biodiversity or important ecological corridors in a local context. Small sustainable population of notable species not qualifying for higher importance or uncommon locally.
Site (local lower)	Common, heavily-managed or modified habitat, and common and widespread species.

[1] Terms in brackets are adapted from NRA (2009b).

[2] Habitat listed on Annex I of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.

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Potential impacts and effects

Impacts may occur during the construction, operation, and decommissioning phases of a development. They may be direct or indirect (also termed 'secondary'). Direct impacts are attributable to an action associated with a development. Indirect impacts are often produced away from a development or as a result of other initial impacts. In this case, the completed Development is expected to remain indefinitely, therefore decommissioning is not considered relevant.

Under CIEEM (2018) guidance there is a distinction between impact and effect. An impact is an action on an ecological feature (e.g. hedgerow removal; loss of a bat roost). An effect is the outcome of that impact on an ecological feature (e.g. effect of hedgerow loss on breeding birds; effect of bat roost loss on the conservation status of the bat species).

Likely impacts/effects are characterised using those parameters below that are necessary to understand them:

- direction – whether the impact will have a beneficial, neutral or adverse effect;
- magnitude – the 'size', 'amount' or 'intensity' of an impact, described in quantitative terms as far possible;
- extent – the spatial or geographical area or distance over which the impact or effect occurs;
- duration – the time over which an impact/effect is expected to last prior to recovery or replacement (if possible) of the feature. Where appropriate, ecological aspects such as lifecycles are considered. The duration of an effect may be longer than the duration of an activity or impact;
- timing and frequency – timing is important since an effect might not occur if critical seasons or life stages are avoided. Frequency considers repetition of an activity, which may result in a greater effect; and,
- reversibility – whether the effect is temporary or permanent. A temporary impact/effect is one from which recovery is possible or for which effective mitigation is possible and enforceable. A permanent effect is one from which recovery is either not possible or cannot be achieved within a reasonable timescale (in the context of the feature being assessed).

Consideration is given to conservation objectives, whether processes within sites will be altered, effects on habitats and species population size/viability, and whether these will have an effect on conservation status. Conservation status includes the abundance and distribution of species, and the extent, structure and function, and typical supported species of habitats.

Consideration is also given to cumulative effects, since effects acting in combination may have a cumulative effect exceeding that of the separate effects. Cumulative effects may arise from a combination of effects from the Proposed Development itself (e.g. effects at the construction and operation stages), or the combined effects from different developments.

Under EPA (2017), effects are also categorised as likely or not likely, and note must be made of any transboundary effects (effects extending into other countries).

Significance

An effect (positive or negative) is significant at a specified geographical level if it affects the ecological integrity of a site or ecosystem or the conservation status of a species or habitat. If not significant at the level it was considered important, an effect could be significant at a lower geographic level (for example, an effect on a nationally-important population may not be significant to the national population). These assessments are based on quantitative evidence where possible, and as necessary through professional judgement.

Initially, the effect significance does not consider mitigation (avoidance or reduction) or compensation

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measures. The residual effect significance takes such measures into account, with the aim that, wherever possible, residual effects are not significant or are significant at a lower geographic level than the unmitigated effects. Whilst embedded mitigation (inherent to the project design) can be considered prior to assessment of residual effects, landscape and planting designs are commonly considered at the residual effect stage to make clear the degree of effect without such mitigation and the importance of securing it.

CIEEM (2018) advise that where there is reasonable doubt and a conclusion of no significant effects cannot be robustly reached, this uncertainty should be acknowledged and a significant effect assumed, in line with the precautionary principle.

3.7 Approach to mitigation

Where impacts on relevant ecological features are predicted, the approach to mitigation engages the following hierarchy:

1. Avoid features where possible.
2. Minimise impact by design, method of working or other measures, for example by enhancing existing features.
3. Compensate for significant residual impacts (e.g. by providing suitable habitats elsewhere).

This hierarchy requires the highest level to be applied where possible. Only where this cannot reasonably be adopted are lower levels considered, giving rationale including sufficient detail to show that the measures are feasible and would be provided.

NPF supports the protection and promotion of natural assets and biodiversity via green infrastructure, and the South Dublin County Council Development Plan includes several nature conservation policies relevant to the Proposed Development. The Clonburris SDZ Planning Scheme and Clonburris SDZ Biodiversity Management Plan, which include the boundary of the Proposed Development, also provides several ecological objectives. Therefore, the potential to secure biodiversity benefits, and compliance with these policies and objectives, have been considered in this assessment.

3.8 Limitations

Desk study information is dependent on records having been submitted for the area of interest. As such, a lack of records for particular habitats or species does not necessarily mean they are absent from the area of interest. Similarly, the presence of records for particular habitats and species does not automatically mean they still occur within the area of interest or are relevant in the context of the Proposed Development.

Extensive previous ecological survey data was available which was relevant to the Site and wider Clonburris SDZ area. The assessment described in this report is largely based on this information and assumes this is accurate. However, a ground-truthing walkover survey was also conducted by AECOM to ensure that the baseline of the Site was largely as described.

Where habitat boundaries coincide with discernible boundaries on recent aerial photographs (where available) the resolution is as determined by the accuracy of the aerial photographs. Otherwise, habitat mapping is as estimated in the field. Where areas of habitat are given, they are approximate and should be verified by measurement on site where required for design or construction.

4. Baseline conditions

4.1 Nature conservation designations

4.1.1 Statutory designations

There are six international nature conservation designations (e.g. SACs and SPAs) within 15 km of the Site and one statutory nationally designated site within 2 km of the Site. These are set out in Table 5, below. Sites are listed in ascending order of distance from the Proposed Development, with those closest described first. The locations of the statutory designated sites relative to the Proposed Development are shown on Figure 2.

4.1.2 Non-statutory designations

There are no non-statutory designations for nature conservation within 2 km of the Development.

4. Baseline conditions

Table 5. Statutory designated nature conservation sites

Site name [site code]	Reason(s) for designation	Distance and direction from the Proposed Development
Grand Canal pNHA [2104]	The Grand Canal pNHA comprises a man-made canal channel and the banks on either side of it. The ecological value of this site includes the diversity of habitats including hedgerows, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland. It is also species diverse comprising otter, amphibians, aquatic flora and the rare and legally protected opposite-leaved pondweed *Groenlandia densa*. The site is a linear habitat that provides a refuge for species.	110 m south. Intervening land predominately comprises fields in the Clonburris SDZ.
Rye Water Valley/Carton SAC [1398]	Desmoulin's whorl snail *Vertigo moulinsiana* [1016] Narrow-mouthed whorl snail *Vertigo angustior* [1014] Petrifying springs with tufa formation *Cratoneurion* [7220]	4.6 km north-west. Intervening lands predominately comprise residential areas of Lucan and Adamstown, Griffeen Valley Park, fields, and the Weston Airport.
Glenasmole Valley SAC [1209]	Molinia meadows on calcareous, peaty or clayey-silt-laden soils *Molinion caeruleae* [6410] Petrifying springs with tufa formation *Cratoneurion* [7220] Semi-natural dry grasslands and scrubland facies on calcareous substrates *Festuco-Brometalia* * [6210]	9.4 km south. Intervening lands predominately comprise residential and commercial areas of Clondalkin and Tallaght.
Wicklow Mountains SAC [2122]	Alpine and boreal heaths [4060] Blanket bogs (* if active bog) [7130] Calaminarian grasslands of the *Violetalia calaminariae* [6130] Calcareous rocky slopes with chasmophytic vegetation [8210] European dry heaths [4030] Natural dystrophic lakes and ponds [3160] Northern Atlantic wet heaths with *Erica tetralix* [4010] Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] Oligotrophic waters containing very few minerals of sandy plains *Littorelletalia uniflorae* [3110] Otter [1355] Siliceous rocky slopes with chasmophytic vegetation [8220] Siliceous scree of the montane to snow levels *Androsacetalia alpinae* and *Galeopsietalia ladani* [8110] Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas [6230]	11.3 km south-east. Intervening lands predominately comprise residential and commercial areas of Clondalkin and Tallaght, with some fields and woodland near the Wicklow Mountains SAC.
Wicklow Mountains SPA [4040]	Merlin *Falco columbarius* [A098] (permanent) Peregrine *Falco peregrinus* [A103] (permanent)	13.8 km south-east. Intervening lands predominately comprise residential and commercial areas of Clondalkin and

4. Baseline conditions

Site name [site code]	Reason(s) for designation	Distance and direction from the Proposed Development
		Tallaght, with some fields and woodland near the Wicklow Mountains SAC.
South Dublin Bay and River Tolka Estuary SPA [4024]	Arctic tern *Sterna paradisaea* [A194] (concentration) Bar-tailed godwit *Limosa lapponica* [A157] (wintering) Black-headed gull *Chroicocephalus ridibundus* [A179] (wintering) Common tern *Sterna hirundo* [A193] (concentration) Dunlin *Calidris alpina* [A149] (wintering) Grey plover *Pluvialis squatarola* [A141] (wintering) Knot *Calidris canutus* [A143] (wintering) Light-bellied brent goose *Branta bernicla hrota* [A046] (wintering) Oystercatcher *Haematopus ostralegus* [A130] (wintering) Redshank *Tringa totanus* [A162] (wintering) Ringed plover *Charadrius hiaticula* [A137] (wintering) Roseate tern *Sterna dougallii* [A192] (concentration) Sanderling *Calidris alba* [A144] (wintering) Wetland and waterbirds [A999]	13.8 km east. This SPA is downstream of the Site. Intervening lands predominately comprise residential and commercial areas of Dublin.
South Dublin Bay SAC [0210]	Annual vegetation of drift lines [1210] Embryonic shifting dunes [2110] Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonising mud and sand [1310]	14.6 km east. This SAC is downstream of this Site. Intervening lands predominately comprise residential and commercial areas of Dublin.

* Indicates Annex I habitat under the Habitats Directive that is a priority habitat.

Permanent: to be found throughout the year on the site (non-migratory species, resident population of migratory species).

Reproducing: uses the site to raise young (e.g. breeding, nesting).

Concentration: site used for staging or roosting or migration stop/over or for moulting outside the breeding grounds and excluding wintering.

Wintering: uses the site during the winter.

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4.2 Habitats

The habitats present within 50 m of the Site are shown on Figure 3 and described in the sub-headings below. Within the Site boundary, habitat descriptions are predominately based on the results of the walkover survey carried out by AECOM in April and August 2021. Habitat descriptions for areas outside of the Site boundary were primarily based on roadside binocular assessments in April 2021 and August 2021 and/or surveys carried out for the Clonburris SDZ Road Infrastructure Development in July 2020 (Stephen Little and Associates, 2020). Habitat descriptions from FERS (2018) and Scott Cawley (2020a) were also considered where relevant. Treelines and hedgerows identified in the arboricultural survey reports (CMK, 2020; Tree File Ltd., 2020) are described where relevant. In locations where the Kilmahuddrick Stream is outside of the Site boundary, it is mapped in accordance with AWN Consulting (2020) and Stephen Little and Associates (2020).

The dominant habitats within the Site are buildings and artificial surfaces, recolonising bare ground, meadows, and scrub. There are also treelines, hedgerows, and watercourses within the Site. Habitats present are described below in the order that they are listed in in *A Guide to Habitats in Ireland* (Fossitt, 2000).

FW2 Depositing/lowland rivers

The Kilmahuddrick Stream is a relatively small stream located in the western section of the Site (see Figure 3). It is a tributary of the Griffeen River, and discharges into this river approximately 720 m downstream of the Site to the north-west. The Griffeen River flows into the River Liffey further downstream.

The Kilmahuddrick Stream has a moderate northern flow with clear water. It has a width of approximately 2 m and a low water depth of 10 to 20 cm at the time of the AECOM survey in April 2021. The bed substrate consists of pebbles approximately 5 cm in diameter near a hardstanding area to the south, and becomes finer sand with frequent debris further upstream to the north. There is no instream vegetation. The banks are moderately to gently sloping and are dominated by Atlantic ivy *Hedera hibernica* and bare soil in some sections and bramble *Rubus fruticosus* agg. and common nettle *Urtica dioica* in others. The bankside vegetation also includes cleavers *Gallium aparine*, red dead-nettle *Lamium purpureum*, dandelion *Taraxacum officinale* agg., creeping buttercup *Ranunculus repens*, herb-robert *Geranium robertianum*, and harts-tongue *Asplenium scolopendrium*.

The stream is partially shaded by bramble, mainly in the northern section of the Site. There is low-lying bramble vegetation present along the western side of the stream in the Site, which is overgrown and shades the northern parts of the stream. The stream becomes more open in the southern section of the Site. There is a treeline along the eastern side of the stream which is dominated by tall hybrid black-poplar *Populus x canadensis*, the understorey of this treeline is sparse in the northern section of the Site which becomes denser in the south with alder *Alnus glutinosa*, hawthorn *Crataegus monogyna*, and bramble with some elder *Sambucus nigra*. Notably, there is dense butterfly-bush *Buddleja davidii* scrub, which is a medium-impact invasive non-native species in Ireland, located directly east of the Kilmahuddrick Stream and associated treeline in the northern section of the Site (see Figure 4).

Approximately 140 m to the south of the Site the Kilmahuddrick Stream is culverted underneath the Grand Canal. The stream is also culverted under an existing road in the Site and to the north-west of the Site underneath the railway line. The stream has slower flow and less clear water upstream of the road culvert to the south of the Site.

FW4 Drainage ditches

There is one drainage ditch at the centre of the Site, which splits to the north near the existing residential

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area. It is approximately 20 cm deep with turbid, stagnant water. It has no instream vegetation. The banks are steep with Atlantic ivy and occasional hart's-tongue and hogweed *Heracleum sphondylium*. It is partially shaded by bramble and hawthorn on the eastern edge. The drainage ditch continues under the railway line fence.

GA1 Improved agricultural grassland

There is a field of improved agricultural grassland within 50 m of the Site to the south that forms a mosaic with dry meadows and grassy verges and scrub. The agricultural grassland within the Clonburris SDZ is typically grazed by horses and is species-poor with short sward. These agricultural grasslands are dominated by perennial ryegrass *Lolium perenne* and white clover *Trifolium repens* with frequent thistle *Cirsium* spp., ribwort plantain *Plantago lanceolata*, and creeping buttercup *Ranunculus repens* (Stephen Little and Associates, 2020; FERS, 2018).

GS2 Dry meadows and grassy verges

There is a field of dry meadows and grassy verges surrounding the existing residential area at the eastern section of the Site (see Figure 3). This field has an extremely short sward and appears to be highly disturbed by humans and dogs.

Dry meadows and grassy verges within the Clonburris SDZ are generally dominated by a limited number of coarse grass species. They typically comprise false oat-grass *Arrhenatherum elatius,* Yorkshire-fog *Holcus lanatus,* sweet vernal-grass *Anthoxanthum odoratum*, and cock's-foot *Dactylis glomerata* with occasional creeping thistle *Cirsium arvense*, silverweed *Potentilla anserina,* creeping buttercup, and curled dock *Rumex crispus* (Stephen Little and Associates, 2020; FERS 2018).

WD1 Mixed broadleaved woodland

A relatively small area of mixed broadleaved woodland (c. 30 x 50 m in area) is located within the western section of the Site. There is a lack of defined woodland structure, and the parcel has succeeded from a scrub type habitat. It is relatively species-poor and dominated by dense willow *Salix* spp. trees that are approximately 6 to 8 m tall. There is a small man-made wet area with a drainage pipe that outfalls into wet trenches, common reed *Phragmites australis* is present growing adjacent to the drainage pipe. There is also bramble and common nettle in the understory of this woodland and planted silver birch *Betula pendula* by the path.

In the wider Clonburris SDZ, this woodland type generally has a high density of trees and sparse understory vegetation. It is typically dominated by sycamore *Acer pseudoplatanus* with frequent alder, and ash *Fraxinus excelsior.* Other species present include bramble, false oat-grass, creeping thistle, great willowherb *Epilobium hirsutum*, and rosebay willowherb *Chamaenerion angustifolium* (Stephen Little and Associates, 2020).

WD2 Mixed broadleaved/conifer woodland

A small section of mixed broadleaved/conifer woodland that forms a mosaic with mixed broadleaved woodland is located approximately 30 m south-west of the Site. This habitat type in the Clonburris SDZ is typically dominated by non-native tree species and is relatively species-poor with no defined woodland structure (Stephen Little and Associates, 2020; FERS 2018).

WS1 Scrub

There are large areas of scrub habitat within the Site, which are generally species-poor and contain non-native species.

The majority of this scrub habitat forms a mosaic with recolonising bare ground in the western section of the Site where it is dominated by bramble and the invasive non-native species, butterfly-bush. There is also goat willow *Salix caprea,* elder, hogweed, rosebay willowherb, nettle, hedge bindweed *Calystegia sepium,* and a few ash trees within this area. One stand of cherry laurel

4. Baseline conditions

Prunus laurocerasus, which is an invasive non-native species, is also present. This area comprised a former tree nursery for SDCC, which has been unmanaged for over ten years. The former nursery plantings included Norway maple *Acer platanoides*, grey alder *Alder incana*, silver birch *Betula pendula*, small-leaved lime *Tilia cordata* cultivars, and white willow *Salix alba* (CMK, 2020). Some former tree nursery species are present in the Site within this area including white willow and birch *Betula* sp.. A planted plum species *Prunus* sp. is also present at the centre of this area. West of the Kilmahuddrick Stream scrub habitat in a mosaic with disturbed ground is dominated by thickets of the non-native red osier dogwood *Cornus sericea*. A further description of the recolonising bare ground and scrub mosaic habitat in the Site is provided in the ED3 Recolonising bare ground sub-section below.

A corridor of scrub habitat dominated by bramble is located along the railway line within the Site to the north of the existing residential community. There is also some scrub associated with the vacant derelict structure on Site (see Figure 3).

WS2 Immature woodland

There is a small area of immature woodland located approximately 30 m south-east of the Site.

Immature woodland described within the Clonburris SDZ is typically dominated by sycamore with abundant hawthorn and blackthorn *Prunus spinosa* (Stephen Little and Associates, 2020).

WL1 Hedgerows

There is one hedgerow in the Site, which is relatively species-poor and is dominated by butterfly-bush with occasional willow, bramble, and dog-rose *Rosa canina*. It is dense and approximately 4 m tall and 4 m wide. The understory includes Atlantic ivy, hogweed, cleavers, hedge bindweed, common nettle, and broad-leaved dock *Rumex obtusifolius*. There is a smaller hedgerow dominated by bramble to the north of the Site boundary fence along the railway line. There are also hedgerows associated with the treelines within the Site (see the WL2 Treelines section below for more detail on treelines).

The hedgerows within the wider Clonburris SDZ are typically dominated by sycamore, alder, hawthorn, ash, and blackthorn. Dog-rose and elder are frequent and wild privet *Ligustrum vulgare* is occasional. White willow and crack-willow *Salix fragilis* are locally present in areas with wet soils. Other species also typically include horse-chestnut *Aesculus hippocastanum*, bramble, hogweed, and cleavers (Stephen Little and Associates, 2020; Tree File Ltd., 2020; FERS 2018). FERS (2018) also noted the following tree, shrub and woody climber species in the Clonburris SDZ lands: field maple *Acer campestre*, Norway maple, sycamore, Italian alder *Alnus cordata*, silver birch, Lawson's cypress *Cupressus lawsoniana*, dogwood *Cornus sanguinea*, hazel *Corylus avellana*, spindle *Euonymus europaeus*, beech *Fagus sylvatica*, holly *Ilex aquifolium*, honeysuckle *Lonicera periclymenum*, crab apple *Malus sylvestris*, Sitka spruce *Picea sitchensis*, aspen *Populus tremula*, wild cherry *Prunus avium*, wild plum *Prunus domestica,* black currant *Ribes nigrum*, grey willow *Salix cinerea*, bittersweet *Solanum dulcamara*, rowan *Sorbus aucuparia*, gorse *Ulex europaeus*, wych elm *Ulmus glabra*, and guelder rose *Viburnum opulus*.

WL2 Treelines

There are several treelines within the Site, which form corridors linking the Grand Canal and the railway line.

Tall (20 m) hybrid black-poplar treelines are located along the eastern side of the Kilmahuddrick Stream and along the western boundary of the existing residential community field. The treeline along the eastern side of stream is dominated by hybrid black-poplar and also comprises alder, grey alder, hawthorn, ash, sycamore, bramble, elder, blackthorn *Prunus spinosa*, rosebay willowherb, privet *Ligustrum* sp., herb-robert, marsh woundwort *Stachys palustris*, and creeping thistle. The treeline along the western boundary of the existing

residential community field is dominated by hybrid black-poplar trees with occasional ash, bramble, and privet. It is worth noting that part of this hedgerow was identified in the Planning Scheme for retention as it is of particular heritage interest. It represents a landscape feature of both historic and cultural heritage value where the hedgerow marks both a townland and civil parish boundary and is likely to hold a significant biodiversity interest.

There are also treelines along the existing road in the Site that are generally 5 m tall and comprised hawthorn, ash, elder, sycamore, blackthorn, bramble and ash. These treelines typically comprise a hedgerow layer (see the WL1 hedgerow section above for more detail on hedgerows).

There is also a poor-quality treeline of immature hybrid black-poplar and sycamore and treeline of planted immature pin oak *Quercus palustris* that are relics of the former tree nursery in the disturbed recolonising bare ground and scrub habitat.

Treelines within the wider Clonburris SDZ are typically dominated by sycamore, ash, and poplar with occasional horse-chestnut and white willow (Stephen Little and Associates, 2020; FERS, 2018). These treelines provide ecological connectivity throughout the Site and wider areas.

ED3 Recolonising bare ground

Recolonising bare ground is present throughout the western section of the Site and it is generally found in small, disturbed patches within a scrub mosaic habitat. There are also scattered rocky disturbed areas throughout this area.

Several invasive non-native species are present in this recolonising bare ground and scrub habitat in the Site which include Japanese knotweed *Reynoutria japonica*, Spanish bluebell *Hyacinthoides hispanica*, cherry laurel, butterfly-bush, snowberry *Symphoricarpos albus* and winter heliotrope *Petasites fragrans* (see Figure 4).

Other plant species typically include teasel *Dipsacus fullonum*, common nettle, hogweed, cleavers, hedge bindweed, bramble, rushes *Juncus* spp., thistle species *Cirsium* spp., rosebay willowherb, tutsan *Hypericum androsaemum*, creeping cinquefoil *Potentilla reptans*, water figwort *Scrophularia auriculata*, dandelion, broad-leaved dock, colt's-foot *Tussilago farfara*, creeping buttercup, bush vetch *Vicia sepium,* common ragwort *Jacobaea vulgaris,* common field-speedwell *Veronica persica*, forget-me-not species *Myosotis* spp., willowherb species *Epilobium* spp., plantain species *Plantago* spp., and perennial ryegrass. Scarlet pimpernel *Lysimachia arvensis*, red bartsia *Odontites vernus*, and square-stalked St John's-wort *Hypercium tetrapterum* were also present by the path between the scrub and recolonising bare ground mosaic and the Kilmahuddrick Stream.

BL3 Buildings and artificial surfaces

Buildings and artificial surfaces within 50 m of the Site include occupied and vacant residential dwellings, outbuildings, industrial yards, roads, paved areas, and the railway line. They are of negligible ecological significance and comprise built-up areas with occasional small areas of scrub, amenity grassland, ornamental gardens, and bare ground.

4.3 Protected and notable species

Baseline protected and notable flora and fauna species information is provided under the following sub-headings and is based largely on the desk study data for the wider Clonburris SDZ (Stephen Little and Associates, 2020; FERS, 2018; FERS, 2015), augmented by the walkover survey carried out in April 2021 and further botanical survey carried out in August 2021 by AECOM. The most recent data available is referenced when describing the species baselines.

Records of protected and notable species identified by the NBDC search (excluding records more than 50 years

old) are referred to under the species sub-headings. However, a summary of all relevant records returned by the NBDC database search within 2 km of the Site is provided in Appendix A.

4.3.12 Plants

No rare or protected plant species were reported within 50 m of the Site, nor recorded during the 2021 ecology surveys.

The NBDC database search returned two rare plant species within 2 km of the Site. One of which was opposite-leaved pondweed (near threatened and listed on the Flora Protection Order). It was recorded approximately 1.8 km east of the Site in 1999. This species prefers canals, streams, and ditches with shallow, clear, and base-rich waters. Therefore, the Site provides suitable habitat for opposite-leaved pondweed (i.e. Kilmahuddrick Stream), but this species was not recorded during recent surveys.

Green figwort *Scrophularia umbrosa* (near threatened) was recorded in the NBDC database approximately 1.9 km north-west of the Site near the River Liffey in 1999. The preferred habitat of green figwort is fertile soils by streams and rivers and within damp woodland. It is a rare species in Ireland that is more or less confined to the River Liffey, according to the Botanical Society of Britain and Ireland (BSBI). This species was also not recorded during recent surveys and the habitats on Site are sub-optimal to support the species.

4.3.2 Bats

The Site comprises moderately suitable habitat for commuting and foraging bats, in particular along the Kilmahuddrick Stream and associated hedgerow/treeline which are well-connected to the wider landscape.

The following seven bat species have been recorded in the wider Clonburris SDZ lands: brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, Daubenton's bat *Myotis daubentonii*, Leisler's bat *Nyctalus leisleri*, Nathusius' pipistrelle *Pipistrellus nathusii*, soprano pipistrelle *Pipistrellus pygmaeus*, and whiskered bat *Myotis mystacinus* (Stephen Little and Associates, 2020; FERS, 2018; FERS, 2015).

A review of the NBDC database returned records of several bat species within 2 km of the Site, comprising brown long-eared bat, common pipistrelle, Daubenton's bat, Leisler's bat, and soprano pipistrelle. These records do not state whether any of them are bat roosts, or merely observations of flying bats. Note that an absence of roost or bat records from any desk study source does not in itself imply the absence of roosts or bats at the Site.

Bat roosts

No evidence of roosting bats and no trees or structures with bat roost suitability have been recorded within the Site during the 2021 walkover survey or reported within 50 m of the Site during previous surveys.

No observations of bats emerging or re-entering any roosts within 50 m of the Site were reported during previous walked transect surveys. In September 2015, four to six individual soprano pipistrelles were observed emerging from trees along the laneway leading to the Cappaghmore/Rosebank House, which is approximately 1.9 km to the east of the Site (FERS, 2015).

Bat activity

The habitats within the Clonburris SDZ, particularly treelines, hedgerows, Kilmahuddrick Stream, Grand Canal, and the railway line, provide suitable commuting and foraging routes for bats and are well connected to the wider environment.

Two static detectors were previously deployed within the Clonburris SDZ lands at the Grand Canal (300 m and 1.0 km from the Site) and one static detector was deployed within the Clonburris SDZ lands at an agricultural field adjacent to the railway line (1.2 km from the Site). The

static detector in the agricultural field by the railway line recorded common pipistrelle, Leisler's bat, and soprano pipistrelle. Based on the similar habitats present within the Site, these three relatively common species are also likely found within the Site. The static detectors at the Grand Canal recorded these three species and additionally recorded Daubenton's bat, Nathusius' pipistrelle, and whiskered bat (FERS, 2018).

Walked transect surveys were previously carried out within the main fields of the Clonburris SDZ between the railway line and the Grand Canal, along the Grand Canal, and near the Clondalkin Train Station. The majority of bats within the Clonburris SDZ were recorded along the Grand Canal and included the following species: brown-long eared bat, common pipistrelle, Daubenton's bat, Leisler's bat, Nathusius' pipistrelle, soprano pipistrelle, and whiskered bat. Common pipistrelle, Leisler's bat and soprano pipistrelle were recorded foraging and commuting within the fields, predominately along woodland and hedgerow habitats in the unlit middle sections of the Clonburris SDZ lands (Stephen Little and Associates, 2020; FERS, 2018).

Overall, the bat activity and diversity decreased with greater distances from the Grand Canal (Stephen Little and Associates, 2020; FERS, 2018).

4.3.3 Otter

No evidence of otter (e.g. tracks, spraints, holts) has been recorded within the Site during the 2021 walkover survey or previously reported within 50 m of the Site. No otter holts have been reported within 150 m of the Site.

Suitable habitat for commuting otter is present within the Site along the Kilmahuddrick Stream, which flows into the Griffeen River further downstream. However, watercourses within the Site (i.e. the Kilmahuddrick Stream and drainage ditch) are unlikely to have suitability for foraging otter due to the likely absence of any substantial fish populations. The Site also has limited suitability for otter refuge creation due to the frequent human disturbance.

According to the SDCC, otter spraints have been previously identified at the Griffeen River (downstream of the Kilmahuddrick Stream), but no dates were provided for these records. Otter have also been historically known to use the Grand Canal, which is located approximately 140 m south of the Site and directly connected by the Kilmahuddrick Stream. Two spraints were recorded in 2015 approximately 1.0 km south-west of the Site at the Grand Canal (FERS, 2015; Minogue and Associates Ltd., 2017). However, no evidence of otter has been recorded in the Grand Canal in recent surveys (Stephen Little and Associates, 2020; FERS, 2018).

One record of otter within 2 km of the Site was returned from the NBDC database at the Grand Canal approximately 1 km south-west of the Site in 1980.

4.3.4 Badger

No evidence of badger (e.g. tracks, latrines, setts) has been recorded within the Site during the 2021 walkover survey or previously reported within 150 m of the Site.

The habitats within the Site are considered sub-optimal for badger sett creation or any badger activity (foraging / commuting) due to the substantial and frequent disturbance by the local residential community and dogs.

A disused badger sett with three entrances was previously identified in near Kishoge Road and the Grand Canal located approximately 200 m south-west of the Site. A camera trap installed nearby the Grand Canal approximately 1.6 km west of the Site recorded badger, which indicates that badger frequents the wider landscape (FERS, 2016b). However, there has been an absence of recent badger records in the wider Clonburris SDZ (Stephen Little and Associates, 2020).

No records of badger within 2 km of the Site were returned from the NBDC database search.

Despite the absence of recent badger records in the wider Clonburris SDZ and the sub-optimal habitat with

considerable human and dog disturbance, the Site may provide habitat for opportunistic badger to occur but is unlikely to be of significant importance to any badger population present in the wider area particularly as there is limited potential for active badger setts.

4.3.5 Other mammals

Hedgehog *Erinaceus europaeus,* Irish hare *Lepus timidus hibernicus*, Irish stoat *Mustela erminea hibernica*, pine marten *Martes martes*, pygmy shrew *Sorex minutus,* and red squirrel *Sciurus vulgaris* are protected under the Wildlife Acts.

There is no suitable habitat on Site for pine marten or red squirrel, as these species require extensive and connected woodland habitat rather than the small, fragmented woodland areas present. Grey squirrel *Sciurus carolinensis* have been recorded in the Clonburris SDZ and are likely present in the Site. The presence of grey squirrel is considered to prevent the presence of red squirrel, particularly in deciduous woodlands. Furthermore, evidence of pine marten and red squirrel was not recorded within the Clonburris SDZ (Stephen Little and Associates, 2020; FERS, 2018) and no records were returned from the NBDC database. Therefore, pine marten and red squirrel are unlikely to be present within the Site.

The hedgerow and scrub habitat on Site provide suitable habitat for hedgehog, Irish hare, Irish stoat, and pygmy shrew. All four species are listed as Least Concern on the Red List (Marnell *et al*., 2019). These species, and particularly pygmy shrew, are typically widespread in Ireland (Marnell *et al*. 2019). Evidence of hedgehog, Irish stoat, and pygmy shrew were previously recorded within the Clonburris SDZ lands (FERS, 2018; FERS, 2015). The NBDC database search returned records of pygmy shrew and hedgehog within 2 km of the Site. Therefore, these species are presumed to be present within the Site.

Mammals that are not notable or protected under the Wildlife Acts have also been recorded using the Site, including rabbit *Oryctolagus cuniculus* and fox *Vulpes vulpes*. There are two mammal holes likely used by fox at the northern section of the Site along the drainage ditch.

4.3.6 Amphibians

There is suitable habitat for common frog *Rana temporaria* and smooth newt *Lissotriton vulgaris* in the Kilmahuddrick Stream and within wetter stream margins within the Site (both species are protected under the Wildlife Acts). However, the drainage ditch in the Site does not provide suitable habitat for these species due to apparent poor water quality.

An employee at SDCC at the Grange Depot has observed common frog at the northern section of the Kilmahuddrick Stream within the Site. Common frog has also been observed within wetter areas of grassland throughout the Clonburris SDZ on several occasions in 2015 (FERS, 2015). Smooth newt was not recorded during the walkover survey, but this species could also be present along the Kilmahuddrick Stream.

Records of common frog and smooth newt within 2 km of the Site were returned by the NBDC database.

Accordingly, common frog and smooth newt are presumed to be present on Site within the Kilmahuddrick Stream due to the previous records of these species, the suitable habitats on Site, and that these species are relatively common and widespread in Ireland. In addition, both species are listed as Least Concern on the Red List (King *et al*., 2011).

4.3.7 Reptiles

No evidence of common lizard *Zootoca vivipara*, which is protected under the Wildlife Acts, has been recorded within the Clonburris SDZ during previous surveys. The NBDC database search did not return records of rare or protected reptiles within 2 km of the Site.

This species is relatively common in Ireland and can be found in grassland, scrub and hedgerows. However, the

habitats present on Site are sub-optimal as they are highly disturbed.

4.3.8 Birds – breeding birds (excluding raptors)

Breeding bird surveys were previously carried out within the wider Clonburris SDZ in 2020, 2018, and 2015. The behaviour and confirmed breeding data of most of the bird species recorded during these previous surveys are not provided (Stephen Little and Associates, 2020; FERS, 2018; FERS, 2015).

The following BoCCI red-listed bird species (excluding raptors, which are described in the section below) were recorded during breeding bird surveys in the Clonburris SDZ: grey wagtail *Motacilla cinerea*, meadow pipit *Anthus pratensis,* and swift *Apus apus*.

Breeding bird surveys carried out in June 2020 recorded grey wagtail near the Griffeen River and flying over the Grand Canal and the Clonburris SDZ lands. One individual meadow pipit was observed foraging in the grassland by the Griffeen River and another individual was recorded singing within the Clonburris SDZ. A pair of meadow pipits were also observed foraging and flying in the grasslands in north-eastern section of the Clonburris SDZ Road Infrastructure Development.

There was no evidence of barn swallows, house martins, or swifts using buildings as nesting places within the Site or in the wider Clonburris SDZ Road Infrastructure Development boundary (Stephen Little and Associates, 2020).

The following BoCCI amber-listed bird species (excluding raptors, which are described in the section below) were recorded during breeding bird surveys in the Clonburris SDZ: black-headed gull, goldcrest *Regulus regulus*, greenfinch *Carduelis chloris*, herring gull *Larus argentatus,* house martin *Delichon urbicum*, house sparrow *Passer montanus*, kingfisher *Alcedo atthis*, linnet *Carduelis cannabina*, skylark *Alauda arvensis*, spotted flycatcher *Musciapa striata*, starling *Sturnus vulgaris*, and swallow *Hirundo rustica.*

Kingfisher which are listed on Annex I of the Birds Directive, were observed during the breeding bird surveys and incidentally during other field surveys (Stephen Little and Associates, 2020). Annex I species are rare, in danger of extinction or vulnerable to changes in habitat and require special protection. SPA are designated under the Birds Directive to protect a range of bird populations including those of Annex I species. A kingfisher was observed hunting along the Grand Canal. Two kingfishers were also observed emerging from the woodland to the north of the Grand Canal and flying along the Grand Canal (FERS, 2018). This species requires substantial open riverbanks to breed in, and will therefore not breed within the Site, nor is it likely to regularly use the Kilmahuddrick Stream for foraging because of its small size and partly overgrown nature.

No wader species, such as curlew *Numenius arquata,* lapwing *Vanellus vanellus*, or redshank*,* were observed the during the breeding bird surveys in the Clonburris SDZ. The presence of breeding waders within the Site is considered to be very unlikely due to frequent human and dog disturbances.

Although black-headed gull and herring gull have been previously observed during breeding bird surveys within the Clonburris SDZ, no breeding evidence for these species were recorded during previous surveys and there is limited suitable habitat available. Black-headed gull breeds in wet marshes and therefore will not breed in the Site. Herring gull breeds on large buildings or cliffs which are also absent from the Site. These gull species are widespread in the surrounding area. Therefore, it is very unlikely that there are any considerable breeding gull populations within the Site.

Bird species that are relatively common and BoCCI green-listed in Ireland were abundant within the fields of the Clonburris SDZ for foraging and breeding, such as blackbird *Turdus merula*, chaffinch *Fringilla coelebs*,

dunnock *Prunella modularis*, goldfinch *Carduelis carduelis*, hooded crow *Corvus cornix*, magpie *Pica pica*, mistle thrush *Turdus viscivorus*, robin *Erithacus rubecula,* woodpigeon *Columba palumbus*, and wren *Troglodytes troglodytes*. These species are not individually notable but cumulatively contribute to the diversity of the Site.

A total of 53 protected and rare bird species were returned by the NBDC database search within 2 km of the Site, which are listed in Appendix A. The majority of these bird records are identified at the 10 km grid reference resolution, within which the Site occupies a small extent. Therefore, it cannot be confirmed if these birds were recorded within the Site itself, or in the more extensive area outside the Site within the same 10 km square. Nor can it be confirmed in many cases that they were breeding, since the records mostly do not state whether nests or territorial behaviour were observed.

Overall, there is suitable habitat on Site for breeding bird populations which likely support smaller common bird species as well as the smaller BoCCI amber and red-listed birds (e.g. passerine birds) listed above in this section.

4.3.9 Birds – raptors (breeding/non-breeding)

Barn owl *Tyto alba* and kestrel *Falco tinnunculus* were the only BoCCI red-listed raptor species recorded in the Clonburris SDZ (Stephen Little and Associates, 2020; FERS, 2018; FERS, 2015). No BoCCI amber-listed raptor species were recorded in the Clonburris SDZ. The BoCCI green-listed raptor species recorded in the Clonburris SDZ include buzzard *Buteo buteo*, long-eared owl *Asio otus*, sparrowhawk *Accipiter nisus,* and peregrine.

Peregrine is listed on Annex I of the Birds Directive and it was observed soaring over grasslands near the R120 located approximately 1 km west of the Site (Stephen Little and Associates, 2020). This species is an SCI bird of the Wicklow Mountains SPA, which is located approximately 13.8 km south-east of the Site. Peregrine typically nest on a cliff-ledge or quarry in undisturbed locations. Therefore, this species would not likely breed within the Site, but it may forage within the Site.

During breeding bird surveys in 2018, a juvenile barn owl was recorded along the Grand Canal, which indicated a likely breeding pair in the vicinity. Another juvenile barn owl was observed hunting in the fields to the east of the Site (FERS, 2018). A barn owl was also recorded flying near the mixed broadleaved woodland in the western section of the Clonburris SDZ (which is partially located in the Site) and another was recorded perching in hedgerows near the Grand Canal in the eastern section of the Clonburris SDZ. Long-eared owl were confirmed to be breeding due to the presence of fledglings within the Clonburris SDZ Road Infrastructure Development boundary (Stephen Little and Associates, 2020). The buildings within 50 m of the Site were considered to be unsuitable for nesting barn owls.

A kestrel was observed hunting over the fields in 2015 near the Clondalkin railway station (located approximately 1.7 km to the east of the Site) (FERS, 2015). As kestrel can be found in a variety of open habitats, such as farmlands and parks, there are small areas of suitable habitat for foraging kestrel within the Site. Kestrel typically nest on rock ledges, buildings, and abandoned corvid nests. Therefore, based on the habitat present, kestrel could breed in the Site.

A juvenile sparrowhawk was recorded along the Grand Canal during breeding bird surveys in 2018, which indicated a likely breeding pair in the vicinity (FERS, 2018). In 2020, a sparrowhawk was also observed in the mixed broadleaved woodland in the western section of the Clonburris SDZ (which is partially located in the Site). This sparrowhawk alarm called after being approached, which could indicate a potential presence of a nest or young birds nearby. Sparrowhawk was also observed flying along the Grand Canal, along the northern side of the railway line, and near the Clondalkin station (Stephen

Little and Associates, 2020). Sparrowhawk were also observed hunting in the Clonburris SDZ lands in January 2020 (Roughan and O'Donovan, 2020). Therefore, sparrowhawk could forage within the Site and breed within the woodland in the Site.

Buzzards were frequently recorded during the bird surveys within the Clonburris SDZ and territorial displays of a pair of buzzards suggest that they likely breed within the Clonburris SDZ (Stephen Little and Associates, 2020). Buzzards typically nest in trees and cliffs usually with access to open land such as farmland, moorland, and wetland. Therefore, buzzards may forage and breed within the Site.

The scrub habitat within the Site and wider Clonburris SDZ provide cover for small mammals and consequently suitable foraging resources for the raptor species discussed in this section. The Site could also provide nesting habitat for kestrel, buzzard, and sparrowhawk as discussed in this section.

4.3.10 Birds – non-breeding birds (excluding raptors)

Non-breeding bird surveys were carried out within and adjacent to the Clonburris SDZ by Scott Cawley in October 2020 (Stephen Little and Associates, 2020) and by Roughan and O'Donovan in January to March 2020 (Roughan and O'Donovan, 2020). The BoCCI red-listed bird (wintering) species recorded during the non-breeding surveys (excluding raptors) were lapwing, meadow pipit, redwing *Turdus iliacus*, and snipe *Gallinago gallinago*. The following BoCCI amber-listed bird species were recorded during the non-breeding bird surveys (excluding raptors): black-headed gull, common gull *Larus canus*, cormorant *Phalacrocorax carbo*, greenfinch, herring gull, house sparrow, lesser black-backed gull *Larus fuscus*, mallard *Anas platyrhynchos*, mute swan *Cygnus olor*, skylark, and starling. Little egret *Egretta garzetta* were observed grazing in a field located approximately 20 m south of the Site near the Kilmahuddrick Stream in February 2020 (Roughan and O'Donovan, 2020). Little egret is a BoCCI green-listed bird species which is listed on Annex I of the Birds Directive. Little egret typically occurs in marshy areas, which are absent from the Site. Therefore, no substantial populations of little egret are likely to occur on the Site.

Other notable waterbirds recorded during the non-breeding bird surveys included cormorant, lapwing, mallard, mute swan, and snipe. A flock of 30 lapwing individuals were recorded foraging and/or roosting north of the railway line by the Clondalkin station, which is located 1.7 km east of the Site. Five snipe individuals were recorded in grassland adjacent to the Griffeen River located outside of the Site. Cormorant and mute swan were only recorded flying over the Clonburris SDZ. Furthermore, these species are often associated with substantial waterbodies, marsh habitat, and/or large open grasslands so they are unlikely to use the habitats present within the Site.

The following notable gulls were recorded during the non-breeding bird surveys: black-headed gull, common gull, lesser black-backed gull, and herring gull. The gulls were typically observed flying over the fields with only one record of black-headed gull grazing in a large field approximately 50 m south of the Site (Roughan and O'Donovan, 2020). Black-headed gull is an SCI species of the South Dublin Bay and River Tolka Estuary SPA (approximately 13.8 km east of the Site). Although black-headed gull was recorded within the Clonburris SDZ during non-breeding surveys, the grasslands within the Site provide limited suitable foraging habitat as they are enclosed by hedgerows and/or scrub encroachment and are frequently disturbed by humans and dogs. Furthermore, there are several suitable fields for gulls in the wider area. Therefore, the Site is unlikely to support any considerable populations of gulls, including black-headed gull.

The other non-breeding SCI bird species of the South Dublin Bay and River Tolka Estuary SPA, such as bar-tailed godwit, dunlin, and oystercatcher, have not been recorded during the non-breeding surveys. These are

coastal bird species that are unlikely to be present in the Site.

There is suitable foraging and shelter habitat within the Site for local smaller overwintering bird populations, such as passerine birds, as described in this section. For example, redwing (BoCCI red-listed species) is a winter migrant from northern and eastern Europe to Ireland that was observed in small flocks along hedgerows within the Clonburris SDZ (Roughan and O'Donovan, 2020; Stephen Little and Associates, 2020).

4.3.11 Fish

It is unlikely that fish use the watercourses within the Site as both the Kilmahuddrick Stream and the drainage ditch have low water levels.

The Kilmahuddrick Stream is a tributary of the Griffeen River, which it meets 720 m downstream of the Site. FERS (2015; 2018) notes that the stretch of the Griffeen River within the Clonburris SDZ appear to have been heavily disturbed. Although the Griffeen River has not been specifically surveyed for fish during surveys of the Clonburris SDZ, FERS (2015) notes that the Griffeen River contains trout *Salmo* sp.. The *Water Framework Directive Fish Stock Survey of Rivers in the Eastern River Basin District* (Kelly *et al.*, 2012) has records of brown trout *Salmo trutta*, European eel *Anguilla anguilla*, roach *Rutilus rutilus,* and three-spined stickleback *Gasterosteus aculeatus* within the Griffeen River. The Griffeen River also has populations of Atlantic salmon *Salmo salar* and sea trout *Salmo trutta trutta* according to Inland Fisheries Ireland (Stephen Little and Associates, 2020). Atlantic salmon (vulnerable, listed in Annex II and V of the Habitats Directive) and European eel (critically endangered) are of conservation concern in Ireland (King *et al.*, 2011; Nelson *et al.*, 2019).

The Grand Canal is located approximately 140 m to the south of the Site. The Kilmahuddrick Stream is culverted underneath the Grand Canal (AWN Consulting, 2020). FERS (2018) notes that the diversity and abundance of fish in the Grand Canal have declined considerably from 2015 to 2018. There were high numbers of roach and perch *Perca fluvialtilis* in 2015 and few of these individuals recorded in 2018 (FERS, 2018).

No fish species were returned within 2 km of the Site from the NBDC database search.

Therefore, although no suitable habitat for fish is present within the Site, Atlantic salmon and European eel are likely present in the Griffeen River, which is hydrologically connected to and downstream of the Site.

4.3.12 Invertebrates

Terrestrial invertebrates

The habitats within the Site such as the meadows and recolonising bare ground provides suitable food resources for insects. During the walkover survey, bees, including an individual red-tailed bumblebee *Bombus lapidarius* (near threated; Nelson *et al.*, 2019) and common butterflies such as peacock *Inachis io* and orange tip *Anthocharis cardamines* were observed to the east to the Kilmahuddrick Stream in the recolonising bare ground habitat within the Site.

Red-tailed bumblebee was also previously recorded within the Clonburris SDZ, although the exact location of this record was not provided (FERS, 2018). Moss carder bee *Bombus muscorum* (near threatened) was recorded by FERS (2018) foraging adjacent to the Clondalkin Train Station within the Clonburris SDZ, which is located approximately 1.7 km east of the Site. Several relatively common butterflies, bees and bumbles were also recorded within the Clonburris SDZ during previous invertebrate surveys (FERS, 2018). The grassy fields within the Clonburris SDZ generally have low insect species diversity and were almost entirely dominated by meadow brown butterfly in previous surveys (FERS, 2015).

The NBDC database had records of four rare butterfly species and four rare bee species within 2 km of the Site. The butterfly species on the NBDC database were dingy

skipper *Erynnis tages* (near threatened), small blue *Cupido minimus* (endangered), small heath *Coenonympha pamphilus* (near threatened), and wall *Lasiommata megera* (endangered). The bee species on the NBDC database were buffish mining bee *Andrena nigroaenea* (vulnerable), moss carder bee (near threatened), small sallow mining bee *Andrena praecox* (vulnerable), trimmer's mining bee *Andrena trimmerana* (critically endangered).

However, as noted above, of the rare invertebrate species returned from the NBDC database search, only the moss carder bee was recorded within the Clonburris SDZ during previous invertebrate surveys. The near threatened red-tailed bumble bee has also been recorded in the Site and the wider Clonburris SDZ.

The grassland in the Site has a very short sward due to considerable human disturbance and rabbit grazing, which would limit the appearance of flowers as a food resource for invertebrates. The moss carder bee prefers red clover *Trifolium pratense* and common knapweed *Centaurea nigra*, which would be limited by disturbance and grazing in the Site. Furthermore, the moss carder bee is typically found in unimproved flower-rich grassland on the coast and in wetlands, which are not present in the Site. The red-tailed bumblebee is found in a large range of habitats including urban areas, parks, and gardens and visits a variety of flower species. There is suitable habitat for the red-tailed bumblebee within the Site, but this habitat is sub-optimal due to its limited floral diversity. The red-tailed bumblebee is unlikely to rely on the habitats within the Site as there is plentiful similar habitat in the surrounding area. Therefore, moss carder bee and red-tailed bumblebee likely only occur in low abundances within the Site and do not rely on the habitats in Site based on the walkover survey observations, previous survey results, and due to the substantial human and rabbit disturbance on Site.

Aquatic invertebrates

There were no previous aquatic invertebrate surveys carried out in the watercourses within 50 m of the Site.

Invertebrate diversity was relatively low in the Grand Canal, the Griffeen River, and feeder streams adjacent to the Grand Canal in 2018 (FERS, 2018). The Griffeen River had very low invertebrate diversity with a common amphipod species, *Gammarus duebeni*, being the dominant species recorded. White-clawed crayfish *Austropotamobius pallipes*, which is protected by the Wildlife Act, was recorded in the Griffeen River and was recorded in relatively high numbers in the Grand Canal in 2015, but this species was absent from the Griffeen River in 2018 and only present in low numbers at one feeder stream location adjacent to the Grand Canal in 2018 (FERS, 2018; FERS, 2015).

Records of two mollusc species within 2 km of the Site were returned from the NBDC database search. Globular pea mussel *Pisidium hibernicum* (near threatened) and iridescent pea mussel *Pisidium pulchellum* (endangered) were both identified approximately 700 km south-west from the Site in the Grand Canal in 2003. Pea mussel (only identified to the genus level) was recorded within the Grand Canal to the south of the Site, but not recorded in the Griffeen River (FERS, 2015).

Based on the limited diversity of suitable habitat present within the Site, which is limited to small sections of the Kilmahuddrick Stream only, and the relatively low aquatic invertebrate abundance and diversity in the nearby watercourses, the Site is unlikely to support notable aquatic invertebrate populations.

4.3.13 Invasive non-native species

Flora

Japanese knotweed (a scheduled invasive species) has been recorded by SDCC in six locations within the Site. This species has been treated between 2017 and 2019 by the SDCC via glyphosate stem injections. Japanese

4. Baseline conditions

knotweed was not recorded during the April and August 2021 surveys. However, the dead stems of this plant can be undetected under dense vegetation and the underground rhizomes likely remain present in the Site. Therefore, on a precautionary basis, Japanese knotweed is considered to be present in at least the six locations within the Site where it has been recorded previously by SDCC.

Spanish bluebell (a scheduled invasive species), cherry laurel (a high-impact, non-scheduled invasive species), butterfly-bush (a medium-impact, non-scheduled invasive species), sycamore (a medium-impact, non-scheduled invasive species), snowberry (a low-impact, non-scheduled invasive species) and winter heliotrope (a low-impact, non-scheduled invasive species) were recorded within the Site. These species have been predominately identified throughout the disturbed recolonising bare ground and scrub mosaic habitat in the Site. In particular, butterfly-bush has spread vigorously throughout most of this habitat in the Site. The locations of these species are presented in Figure 4.

Montbretia *Crocosmia* x *crocosmiflora* (not currently assessed for its invasiveness) has been recorded within existing gardens in the Clonburris SDZ and is therefore presumed to be present within the Site. Montbretia is an ornamental plant with the potential to become invasive and was included in the *Invasive Species Management Plan* for the Clonburris SDZ (Scott Cawley, 2020b).

Himalayan balsam *Impatiens glandulifera* (a high-impact, scheduled invasive species), Canadian waterweed *Elodea canadensis* (a high-impact, non-scheduled invasive species), and Russian-vine *Fallopia baldschuanica* (a medium-impact, non-scheduled invasive species) were recorded within 2 km of the Site from the NBDC database. Although these species could occur within the habitats present on Site, they were not recorded during recent surveys carried out between 2018 and 2021. Therefore, these invasive plant species are considered to be absent from the Site.

Fauna

Brown rat *Rattus norvegicus* and grey squirrel, which are both high-impact invasive species, have been previously recorded within the Clonburris SDZ. Grey squirrel is also a scheduled invasive species. There is also a substantially large population of rabbit (medium-impact invasive species) that intensively graze on the grassland habitat within the Clonburris SDZ (Stephen Little and Associates, 2020; FERS, 2018; FERS, 2015). These species were also recorded within 2 km of the Site from the NBDC database. Therefore, brown rat and grey squirrel are likely to be present within the Site, whilst rabbit is present on the Site.

Jenkin's spire snail *Potamopyrgus antipodarum* (a medium-impact invasive species) was recorded in abundance within the Grand Canal, feeder streams into the Grand Canal, and the Griffeen River during aquatic surveys in 2015 (FERS, 2015). The NBDC database search also returned a record of Jenkin's spire snail approximately 700 km south-west from the Site in the Grand Canal in 2003. According to the NBDC, this species can be found in all types of freshwater systems and could therefore be present within the Kilmahuddrick Stream on Site. FERS (2015) states that there is generally no feasible method to eradicate this species within the Clonburris SDZ.

4.4 Future baseline

4.4.1 Baseline at the time of construction

The Proposed Development is expected to progress within a relatively short time period (likely to commence in 2022 for a duration of approximately 18 months), therefore, the baseline for most of the Site at the time of construction is expected to be similar to that described above.

A possible difference is that construction of proposed new roads in the vicinity of the Site and residential developments adjacent to the Site may be completed or

in progress by the time of writing this report/construction of the Proposed Development commencing. This would result in the presence of more road surface, constructed buildings, and small amounts of peripheral sown neutral grassland along road verges just outside the Site, replacing existing adjacent habitats and resulting in the loss of some hedging. The existing road infrastructure within the Site could also be upgraded as part of the proposed Clonburris SDZ Road Infrastructure Development, this will involve works primarily to existing hard standing areas and is unlikely to materially affect the baseline habitats present. Note that the Clonburris SDZ Road Infrastructure Development, although located within the Site, is being provided independently and is not part of the Proposed Development or included in this impact assessment (see cumulative impacts section 5.7). Therefore, the baseline at the time of construction is likely to be very similar to that described above, with possible minor, non-material changes.

4.4.2 Baseline in the absence of the Proposed Development

The future baseline in the absence of the Proposed Development (the 'do nothing scenario'), taken for these purposes to be the situation 30 years from the time of writing, would likely either be very similar to the current baseline (with grasslands, scrub, buildings, and artificial surfaces dominating the Site), or, given the Site's position in the SDZ, subject to comparable development to the Proposed Development.

In either scenario, no significant improvement in ecological condition of the Site would be likely, particularly as the existing human disturbance and intensive rabbit grazing of the grasslands within the Site would likely continue and as such habitats are unlikely to improve naturally if left in situ. The effects on biodiversity are likely to be similar should an alternative development be progressed, as any such development would be subject to the policies of the Clonburris SDZ (see Section 2.2.4 and 2.2.5), as is the Proposed Development.

5. Impact assessment

5.1 Features excluded from further assessment

The Proposed Development is considered to be a permanent one. Relevant ecological features are those that are considered to be 'important' and have the potential to be affected by the Proposed Development (CIEEM, 2018). In view of the baseline data obtained through desk study and field survey, the following features have been excluded from further assessment because there is considered to be no possible effect on them, through absence of the feature or clear absence of an impact pathway:

- protected plant species (there are no protected plant species reported from within the Site and habitats present are unlikely to support notable species (e.g. plants listed on the Flora Protection Order or those listed on the Red Data Lists). However, hedgerows and treelines (as habitats) are considered further in this Report below);
- red squirrel (no records of this species were returned from the desk study, grey squirrel, which limit and may preclude red squirrel presence, are present in the area, and the Site is composed of sub-optimal habitat that is dominated by hardstanding and grassland with no significant woodland habitats);
- pine marten (no records of this species were returned from the desk study and the Site is composed of sub-optimal habitat that is dominated by hardstanding and grassland with no significant suitable woodland habitat for the species);
- reptiles (no records of these species were returned from the desk study and the Site is composed of sub-optimal, disturbed habitat which precludes the likely presence of notable reptiles);
- breeding and non-breeding waterbirds, e.g. gulls, waders and diving birds (no records of wader species were recorded during breeding bird surveys and the Site is composed of sub-optimal habitat that is dominated by hardstanding and grassland with encroaching scrub and frequent human and dog disturbance);
- invertebrates (the Site is of limited importance to any considerable populations of notable bees and butterflies recorded during the walkover survey and/or returned from the desk study, or notable assemblages of other invertebrates, due to the frequent human disturbance and heavy rabbit grazing across most of the Site limiting floral diversity (i.e. flowers to provide the food source). The Site is also unlikely to support any notable aquatic invertebrate populations due to the poor water quality and limited diversity of the aquatic habitat present); and,
- invasive animal species: brown rat, grey squirrel, rabbit (the Proposed Development will not have an effect on these species which are common throughout Ireland and highly mobile, they will not be inadvertently spread or otherwise affected).

5.2 Importance of ecological features

Ecological features identified in the baseline conditions and not scoped out of detailed assessment (see Section 5.1 above), i.e. those that are considered 'important' (following CIEEM (2018)), are set out in Table 6, together with the rationale. Ecological importance has been assessed on a geographic scale following CIEEM (2018). For the purposes of defining geographical scale in this EcIA, 'County' is defined as Co. Dublin, 'Local (local higher)' as the area within 5 km of the Proposed Development, and 'Site (local lower)' as the Site and immediate surroundings.

5. Impact assessment

Table 6. Importance of ecological features

Ecological feature	Importance	Rationale
Rye Water Valley/Carton SAC [1398]	International (very high)	International nature conservation designation.
Glenasmole Valley SAC [1209]	International (very high)	International nature conservation designation.
Wicklow Mountains SAC [2122]	International (very high)	International nature conservation designation.
Wicklow Mountains SPA [4040]	International (very high)	International nature conservation designation.
South Dublin Bay and River Tolka Estuary SPA [4024]	International (very high)	International nature conservation designation.
South Dublin Bay SAC [0210]	International (very high)	International nature conservation designation.
Grand Canal pNHA [2104]	National (high)	National nature conservation designation.
Site habitats: Kilmahuddrick Stream	Local (local higher)	The Kilmahuddrick Stream is present in the western part of the Site. It flows underneath the Grand Canal, flows into the Site, and then downstream into the Griffeen River. The Griffeen River eventually flows into the River Liffey and then outfalls into the Dublin Bay. The Kilmahuddrick Stream likely provides an ecological corridor in a local context. It is also connected to a wider hydrological network that eventually reaches the Dublin Bay. The Clonburris SDZ Biodiversity Management Plan (Scott Cawley, 2020a) states that streams should be protected to support biodiversity within the local area, such as otter. The Clonburris SDZ Planning Scheme (Minogue and Associates Ltd., 2017) states that the Kilmahuddrick Stream should be protected as it is a key green infrastructure asset within the local area.
Site habitats: hedgerows, treelines, woodland	Local (local higher)	There are several hedgerows and treelines on Site which provide value to the wider Local area, as they are primarily composed of native species and provide connectivity between the Site and surrounding area. The woodland within the Site is also well connected to the wider landscape and so provides some value beyond the Site itself. The Clonburris SDZ Biodiversity Management Plan (Scott Cawley, 2020a) states that hedgerows, treelines, woodland, and mature trees should be retained to support biodiversity within the local area, such as birds and bats.
Site habitats: other	Site (local lower)	The other habitats within the Site are of low ecological importance as they are composed of species-poor disturbed habitats with non-native species such as hardstanding, scrub, recolonising and bare ground, grassland fields, and drainage ditches. However, they do add to the biodiversity of the Site and so have some value at this level only.

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Ecological feature	Importance	Rationale
Bats	Local (local higher)	Bats are protected under the Habitat Regulations which transpose the Habitats Directive. There is foraging/commuting bat activity across the Site, particularly along hedgerows, treelines, and watercourses, and these habitats are connected to the wider area so contribute to the Local resource of such habitat. The species that predominately use the Site are common pipistrelle, soprano pipistrelle and Leisler's bat, which are all relatively common and widespread in Ireland and are also listed as Least Concern on the Red List (Marnell *et al*. 2019)). No evidence of roosting bats and no trees or structures were identified as having bat roost suitability within 50 m of the Site. Therefore, the bat population of the Site, and the suitable foraging and commuting habitat present for bat species, is considered to be of Local (local higher) importance only.
Otter	County (medium)	Otter is legally protected in Ireland under the Habitat Regulations which transpose the Habitats Directive. Otter may commute along the Kilmahuddrick Stream within the Site as otter have been known to use the Griffeen River downstream of the Site and the Grand Canal to the south of the Site. No resting places were identified within 50 m of the Site and the habitats on Site are unlikely to provide any substantial foraging resources for otter. However, otter using the Site are likely to be those using the Griffeen River or other watercourse/waterbodies within the County area given the large territory sizes held by otter, thus the otter population of the site is important at the County (medium) scale.
Badger	Local (local higher)	Badger is legally protected in Ireland under the Wildlife Acts. The habitat within the Site is sub-optimal for badger due to the substantial human and dog disturbance and no badger setts have been recorded in the Site. However, badgers may seldomly use the fields on Site for foraging and commuting habitat as they are known to use the wider area (although records suggest the population is sparse). Thus, badgers using the Site are likely to be important at the Local (local higher) scale.
Other protected mammals: hedgehog, Irish stoat, Irish hare, pygmy shrew	Local (local higher)	These species are protected under the Wildlife Acts. Hedgehog, Irish hare, Irish stoat and pygmy shrew could occur on Site as they are common and widespread and there is suitable habitat on site for these species. Evidence of hedgehog, Irish stoat, and pygmy shrew have been recorded within the Clonburris SDZ. Any populations within the Site would be of Local (local higher) importance only.
Amphibians: common frog and smooth newt	Local (local higher)	Common frog and smooth newt are protected under the Wildlife Acts. Common frog have been noted in the Kilmahuddrick Stream within the Site and on wet grassland within the Clonburris SDZ. There is suitable habitat for common frog and smooth newt at the Kilmahuddrick Stream within the Site. As both species are common and widespread, Site populations are only considered important at the Local (local higher) scale.
Breeding birds (excluding raptors)	Local (local higher)	Two red-listed breeding species could likely breed in the Site based on the habitats present and previous surveys carried out in the Clonburris SDZ, which are: grey wagtail and meadow pipit. Seven amber-listed breeding species could likely breed in the Site based on the habitats present and previous surveys carried out in the Clonburris SDZ, which are: goldcrest, greenfinch, house sparrow, linnet, skylark, spotted flycatcher, and starling. However, as the habitats within the Site are frequently disturbed by humans and dogs and the Site area is relatively small, any population of these species within the Site would likely be less than 1% of the county population. Consequently, a Local (local higher) level of importance for breeding birds is considered appropriate.

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Ecological feature	Importance	Rationale
Raptors (breeding and non-breeding	Local (local higher)	Two red-listed raptor species, barn owl and kestrel, have been recorded in the Clonburris SDZ and could forage in the Site. Kestrel could also breed within the Site. Peregrine, which is listed on Annex I of the Birds Directive, was also observed flying over grasslands approximately 1 km west of the Site. This species is unlikely to breed in the Site as no suitable habitat exists, but could forage there. Although there is potential for notable raptor species to forage within the Site, and for some to breed within the Site, the habitats present are highly disturbed by humans and dogs and the grassland present is sub-optimal for foraging as it is encroached by scrub and enclosed by hedgerows. Any raptors present within the Clonburris SDZ lands would likely prefer the fields with larger open grassland habitat in the surrounding area for foraging on prey.
Non-breeding birds (excluding raptors)	Site (local lower)	Based on previous surveys carried out on the Clonburris SDZ and the habitats present within the Site, the notable non-breeding birds that could potentially overwinter on Site include the red-listed meadow pipit and redwing and the amber-listed greenfinch, house sparrow, skylark, and starling. These species are highly unlikely to have a particular dependence on the habitats within the Site (such as fields, woodland and structures) as such habitats are highly limited on Site but widespread in the surrounding region. Therefore, wintering birds are considered to have a Site (local lower) level of importance due to the habitats present on the Site and in the wider area.
Fish	Local (local higher)	Protected and notable fish are unlikely to use the watercourses within the Site. However, pollution of the Kilmahuddrick Stream in the Site could affect fish approximately 720 m downstream of the Site in the Griffeen River. The Griffeen River contains Atlantic salmon and European eel which are of conservation concern in Ireland. Any pollution of the Kilmahuddrick Stream would likely be diluted downstream of the Griffeen River before it reaches the River Liffey and Dublin Bay and there are several similar streams with these fish present in the county that would not be affected by pollution of the Kilmahuddrick Stream. Therefore, fish are considered to have a Local (local higher) level of importance.
Invasive plant species: butterfly-bush, cherry laurel, Japanese knotweed, montbretia, Spanish bluebell, snowberry, sycamore, winter heliotrope and the invasive Jenkin's spire snail	County (medium)	Japanese knotweed (scheduled invasive) has been previously recorded in six locations within the Site by the SDCC. Spanish bluebell (scheduled invasive), cherry laurel (high-impact invasive), butterfly-bush (medium-impact invasive), snowberry (low-impact invasive), sycamore (medium-impact invasive), and winter heliotrope (low-impact invasive) are also present within the Site. Montbretia (non-native ornamental) could also occur within the Site as it has been recorded within the wider Clonburris SDZ. Jenkin's spire snail is present in the nearby canal. The exacerbated spread of these invasive non-native species, if construction works proceed without appropriate controls in place, could reasonably be expected, based on the extent of the works and likely geographic spread, to affect the wider Co. Dublin area. Therefore, County importance has been assigned. Note that importance here is not assigned because of the value of invasive non-native species, but because of the potential adverse consequences that could arise as a result of their spread.

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5.3 Embedded mitigation

Embedded mitigation describes measures which are incorporated into the design of a development which aim to avoid or reduce adverse effects, including those on ecological features. Embedded mitigation can be considered at the impact assessment stage, whereas specific mitigation measures which are not part of the design and are developed after the initial impact assessment, are assessed at a later stage when considering the residual effects.

The *Clonburris Phase One Civil Engineering Report* (hereafter referred to as the Infrastructure Report) (AECOM, 2022b) details the existing and proposed foul, surface water and watermain infrastructure for the Site. The permanent drainage system for the Proposed Development forms a part of its design and can be considered as embedded mitigation. It incorporates the proposed Sustainable Drainage (SuDS) features: green roofs, permeable paving, bio-retention/rain gardens, landscaping adjacent to paths, swales, and oil separators.

The *Clonburris Phase One Landscape Report* (hereafter referred to as the Landscape Report) (AECOM, 2022c) details the landscape design for the Proposed Development. Embedded mitigation in the landscape design includes the following:

- retention of the majority of notable linear habitats within the Site (the Kilmahuddrick Stream and associated hedgerow/treeline, the drainage ditch within the centre, and the heritage boundary hedgerow to the northwest). Phased management and replacement planting will be required to ensure Health and Safety;
- planting of native and naturalised trees (whips, standards, and semi-mature), hedgerows, low shrub, and native wildflower meadows for replacement and enhancement of habitats;
- creation of a linear parkland along the western side of the Site that will provide a mix of small-scale passive amenities and larger sport and outdoor facilities. The park will aim to retain and enhance the vegetation within this area including existing trees. Native trees, hedgerow, and meadow plantings are proposed in this parkland, both new and as enhancement to existing; and,
- creation of a local park (community green) at the northern boundary of the Site, which will mainly comprise amenity grassland with retained shrub vegetation to the north and planted clipped native hedgerow and trees at the boundary of the park. The drainage ditch in this area will be retained with native hedgerow planting, adding additional value.

5.4 Impacts on nature conservation designations

5.4.1 Internationally designated sites

There are no internationally designated sites within the Site boundary. However, there are six European sites within 15 km of the Site as detailed in Section 4.1.1.

A separate Appropriate Assessment Screening Report has been prepared for the Proposed Development (AECOM, 2022a). This concluded that there will be no likely significant effects from the Proposed Development on any European sites, either alone or in combination with other plans or projects.

Therefore, there will be **no effect** on internationally designated sites as a result of the Proposed Development.

5.4.2 Nationally designated sites

There are no nationally designated sites within the Site boundary. However, there is one national site within 2 km of the Site, which is the Grand Canal pNHA.

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The Grand Canal pNHA is designated for its man-made canal channel and associated adjacent habitats. The ecological value of this site includes the diversity of habitats including hedgerows, tall herbs, calcareous grassland, reed fringe, open water, scrub and woodland. It is also species diverse comprising otter, amphibians, aquatic flora and the rare and legally protected opposite-leaved pondweed.

The Grand Canal pNHA is located approximately 120 m south of the Proposed Development and it is not hydrologically connected to the Proposed Development. The Clonburris SDZ Planning Scheme and Clonburris SDZ Biodiversity Management Plan (Scott Cawley, 2020a; Minogue and Associates Ltd., 2017) detail objectives and actions to be put in place for development within the Site to avoid impacts upon the Grand Canal, including restrictions on activities within 50 m of the canal.

With the intervening distance, lack of connectivity (including hydrological connectivity which could facilitate a pollution impact) and mitigation measures included in the management plans in place, direct effects on the Grand Canal are highly unlikely. Effects on ecological features which may occur in the Site which also contribute to the value of the Grand Canal (such as otter) are assessed separately below.

Therefore, there will be **no effect** on nationally designated sites as a result of the Proposed Development.

5.5 Impacts on habitats

Construction

Direct habitat loss

The Kilmahuddrick Stream and the majority of adjacent hedgerow/treeline habitat will be retained on Site within the proposed linear parkland as described in the Landscape Report (a small section of streamside vegetation, c. 13 m in length, will require removal to facilitate a path crossing the stream). An additional 15 trees within the linear park will also be retained. Full hydrological function of the stream will be maintained as it will be retained on Site (AECOM, 2022b).

Approximately 650 m of hedgerow/treeline will be removed from within the Site. The mature trees within the parcel of mixed broadleaved woodland to the west of the Kilmahuddrick Stream are proposed to be retained in the linear parkland where practicable. In addition, the boundary hedgerow to the north-west will also be retained.

The majority (approximately 80 to 100%) of the other habitats present (assessed to be of Site importance only – i.e. scrub, recolonising and bare ground, grassland fields, drainage ditch) will be lost to the Proposed Development. The existing drainage ditch outside of the community green park will be diverted or culverted under the Proposed Development.

The Landscape Report details a planting regime of hedgerows, treelines, and meadows within the Site, which include extensive native planting, and which is considered to almost fully compensate for the loss of the small areas of higher quality habitat and the more extensive loss of lower quality habitat described. However, there will be a net loss of low-quality habitat which will result in a **permanent adverse effect of Site (lower local) significance**.

Pollution of nearby habitats

There is potential for habitats on Site to be polluted during construction, this is likely to result in local impacts only (however could extend to a larger geographical area via pathways such as the Kilmahuddrick Stream, see below). It is likely that any pollution event could be remediated in the short term with rapid mitigatory action. The habitats within the Site are of relatively low ecological value. Other nearby habitats of low to moderate ecological value include surrounding hedgerows, treelines, woodland, and watercourses. The Kilmahuddrick Stream flows into the Griffeen River,

which flows into the Dublin Bay and its associated internationally designated sites more than 18 km downstream. Therefore, any unmitigated (which is unlikely to occur) pollution events would undergo a considerable dilution effect before reaching any internationally designated sites and are unlikely to have an effect upon them. The Grand Canal is located approximately 170 m upstream of the Site and would therefore not be at risk of any direct pollution from the Proposed Development due to the direction of water flow.

As pollution is only likely to affect nearby habitats during construction, only a **temporary adverse effect of Local (local higher) significance** is considered possible.

Operation

Pollution of nearby habitats

Operation of the Proposed Development will generate no significant environmental hazards (such as airborne or water pollution) that might affect adjacent or nearby habitats. SuDS for the Proposed Development will protect water quality. The construction of housing on Site will increase the possible disturbance to retained habitats during operation of the Proposed Development, however, these habitats are determined to be of low ecological value and actions such as increased trampling are likely to have negligible effect on the already limited diversity of these habitats. Therefore, there is expected to be **no effect** on habitats during the operational phase.

5.6 Impacts on protected and notable species

5.6.1 Bats

Construction

Loss of foraging/commuting habitat

There are no trees or structures with bat roost suitability within 50 m of the Site however approximately 5 ha of suitable foraging/commuting habitat for bats will be lost during the construction. The loss of open fields will result in permanent loss of habitat for Leisler's bat and the loss of hedgerows and treelines will result in a permanent loss of habitat for other bats such as common pipistrelle and soprano pipistrelle.

Whilst the loss of the c. 650 m of internal treelines/hedgerows within the wider side to facilitate development, notable linear features in the Site that provide connectivity offsite to the wider Clonburris SDZ lands will be retained, such as the Kilmahuddrick Stream and associated linear treeline/hedgerow, and the north-west hedgerow boundary between the Site and the railway line.

Hedgerows, treelines, mixed woodland planting, and wildflower meadows are proposed in the Landscape Report to be planted within the Site which will partially compensate for vegetation removed. Native species will be used to ensure biodiversity value is maintained.

Although bats were valued as Local (local higher) importance, due to the retention of the key features on site for bats (particularly the Kilmahuddrick Stream and associated habitats), and the embedded mitigatory planting of treelines, woodland, hedgerows, and wildflower meadows on Site, the Proposed Development is expected to result in a **permanent adverse effect** on bats at **Site (local lower) significance** only.

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Disturbance of foraging/commuting bats

Disturbance of foraging or commuting bats (not including direct loss of foraging/commuting habitat, see above) could occur during the construction phase, particularly if any work is required during darkness hours and artificial lighting is used. However, such disturbance would likely be negligible for the following reasons:

- connected, unilluminated commuting habitat will continue to exist nearby, which will be available to any temporarily displaced foraging or commuting bats; and,
- the works must take place in daylight when bats are not active (in general between the hours of 0800 and 1800).

Construction-related disturbance of foraging and/or commuting bats is therefore not likely to be appreciable and is expected to be a **negligible effect**.

Operation

Disturbance of foraging/commuting bats

There will be permanent lighting fixtures associated with the operation of the residential development area. These have yet to be confirmed but will most likely illuminate the newly constructed amenity areas only.

No lighting is proposed within the linear park, which can continue to be used by commuting and foraging bats with no disturbance from illumination. This will ensure that the eco-park requirement of low or no illumination within parks is met.

However, lighting of other vegetated areas of the Site (e.g. residential, outside the parks), could result in the disturbance of bats or the effective obstruction of this habitat for use by bats if lighting is extensive. Connected, unilluminated commuting habitat will continue to exist outside the Site nearby, and therefore effects of this impact are considered to be limited to the Site itself only. That being said, the species recorded within the Site (i.e. common and soprano, and Leisler's bat) are relatively light-tolerant. Therefore, operational lighting-related disturbance of foraging and commuting bats could result in a **permanent adverse effect of Site (local lower) significance**.

5.6.2 Otter

Construction

Loss or disturbance of commuting habitat

No otter refuges are present on Site and habitat suitable for refuge creation or foraging is highly limited. There is suitable habitat for commuting otter at the Kilmahuddrick Stream in the western section of the Site and this will be retained in the proposed linear parkland described in the Landscape Report. Such commuting habitat could be affected via construction activity such as noise and artificial lighting, or via a pollution event dissuading otter from the affected area. As noted for bats, construction activities will be restricted to the times generally between 0800 and 1800 to reduce noise and lighting disturbance. Pollution events will be temporary as they can reliably be expected to be mitigated rapidly. Thus, should any such disturbance occur this will be temporary for the duration of required construction activities maximum. It is possible that obstruction of the commuting feature through the Site could affect otters travelling to/from the other suitable watercourses in the area such as the Griffeen River and Grand Canal. However, the Griffeen River and Grand Canal are connected where they overlap approximately 900 m south-west of the Site, so this would provide an alternative direct route between these watercourses.

Therefore, disturbance or effective obstruction of commuting features on Site could result in a **temporary adverse effect of Local (local higher) significance**. Note this is based on an assumption of otter presence, as no direct data exists of otters using the Kilmahuddrick Stream.

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Disturbance or injury to commuting otter

Otter using the Site may become trapped / injured by falling into open excavations associated with the construction phase of the Proposed Development. Direct injury may occur from construction traffic on the access route into the Site and within the Site, and the likelihood of this will increase as construction activity increases the volume of traffic.

Given the importance afforded to otter, and the life history strategy of otter (i.e. individuals mature slowly, and females only generally give birth once per year), injury / death of even one individual as a result of the Proposed Development would be relevant at the County scale. Such an impact is likely to be temporary however, as otters are highly mobile and any suitable vacant territory (if present) is likely to be re-occupied quickly.

Therefore, injury / death of one (or a small number) otter would result in a **temporary adverse effect of County (medium) significance**.

Operation

Disturbance of commuting otters

The Kilmahuddrick Stream will be retained during operation of the Proposed Development and it will continue to provide some suitable commuting habitat for otter. There will be an increase in human disturbance, however, this is unlikely to significantly affect the diurnal activity of otter. No lighting is proposed within the linear park or along the stream. Therefore, disturbance to otter is likely to comprise a **negligible effect**.

Pollution

Pollution of aquatic habitats will be prevented during operation of the Proposed Development through implementation of SuDS features as described in the Infrastructure Report and Landscape Report. Therefore, there will be **no effect** on otter as a result of pollution at the operation-phase.

5.6.3 Badger

Construction

Loss/fragmentation of foraging habitat

It is considered possible that badgers will use the Site for foraging as the species is recorded to be present in the wider area. Approximately 3 ha of potentially suitable habitat will be lost to construction of the Development. However, the habitats within the Site are sub-optimal for badger due to the substantial human and dog disturbance. There are several fields in the surrounding area that are more suitable for commuting and foraging badger.

Therefore, the loss / fragmentation of possible foraging habitat in the Site will most likely result in a **permanent adverse effect of Local (local lower) significance**.

Disturbance or injury to commuting/foraging badger

As noted above it is possible (although unlikely) that badgers may visit the Site and therefore may become trapped / injured by falling into open excavations associated with the construction phase of the Proposed Development. Direct injury may occur from construction traffic on the access route into the Site and within the Site, and the likelihood of this will increase as construction activity increases the volume of traffic.

The impact of an injury/death of an individual badger or social group using the Site is likely to be temporary as badgers are mobile and any suitable vacant territory (if present) is likely to be re-occupied fairly quickly, although this may take longer given the apparent sparse badger population in the area of the Site. Should a pregnant sow be killed the impact on recruitment would be greater.

Thus, a **temporary adverse effect of Local (local higher) significance** could occur.

Operation

Road mortality

Badger-vehicle collisions can kill badgers particularly in areas with dense human populations and busy roads. However, as Ireland is principally a rural country, road casualties are a relatively insignificant source of badger mortality (Sleeman *et al.*, 2012).

The roads within the Site itself will be low speed and the potential foraging habitat attractive to badger will be restricted mainly to the green spaces / parks in the Site, away from roads. The green spaces will provide habitat connectivity within and off Site, therefore, badger-vehicle collisions are not likely within the Site itself.

Given the above, and the low badger populations likely to be present in the area, road mortality during the operation-phase will result in a **negligible effect** on badger.

5.6.4 Other protected mammals

Construction

Loss of foraging/commuting habitat

There is suitable habitat for hedgehog, Irish hare, Irish stoat, and pygmy shrew on Site. There will be a loss of some of this suitable habitat, including scrub and hedgerow. However, the hedgerows/treelines and some scrub in the Site will be retained within the proposed linear parkland and community green. In addition, the network of gardens associated with housing provides additional habitat for hedgehog. Furthermore, the Landscape Plan proposes native woodland, hedgerow, and scrub plantings in the proposed linear parkland, community green, and Site boundaries. There is also extensive suitable habitat for these species in the surrounding area. Therefore, the permanent loss of suitable habitat is likely to result in a **temporary adverse effect of Local (local lower) significance** in the short to medium-term but a **negligible effect** in the long-term.

Disturbance or injury to other protected mammals

Hedgehog, Irish hare, Irish stoat, and pygmy shrew may become trapped and injured by falling into open excavations associated with the construction phase of the Proposed Development. Direct injury or death of protected mammals may occur from construction traffic. Given the life history of these small mammals (which can have several large litters per year), the most serious impact (injury or death of a small number of individuals) is unlikely to have a major impact on their overall populations in the local area. Therefore, such impacts on these species are considered to represent a **negligible effect** on these species.

Operation

There are **no effects** on hedgehog, Irish hare, Irish stoat, and pygmy shrew which could realistically arise during the operational phase of the Proposed Development.

5.6.5 Amphibians

Construction

Loss of spawning/foraging habitat

There is suitable habitat for common frog and smooth newt within wet areas around the Kilmahuddrick Stream on Site, which will be retained in the proposed linear parkland. The drainage ditch will be retained within the community green, with other areas culverted, however but this was not considered suitable for amphibians anyway due to the very poor water quality. SuDS features, as part of the drainage design, may also provide additional habitat.

Thus, **no effect** on amphibians via loss of habitat is predicted.

Pollution

Construction-related pollution of aquatic habitats within the Site could temporality impact common frog and smooth newt populations, particularly if a pollution event

occurs during the breeding and spawning season (between January to March for common frog and January to July for smooth newt). Pollution could extend beyond the Site to the wider area. However, there are extensive areas of suitable habitat for the common frog and smooth newt, which are relatively common and widespread species in Ireland, in the local area. Adjacent populations would be expected to recover and replace any losses within the Site in the short to medium-term. Therefore, a pollution event during the construction-phase would, in a worst-case scenario, result in a **temporary adverse effect of Local (local higher) significance**.

Disturbance or injury to amphibians

Common frog inhabit the Kilmahuddrick Stream within the Site and smooth newt are also likely present. Although this stream will be retained amphibians may be present in adjacent terrestrial habitat which could be directly affected (killed or injured) by construction works. Such impacts are only predicted to affect the amphibian population of the immediate working area / Site and, as noted above, amphibian populations adjacent to the Site would be expected to recover and replace any minor losses from such an impact. Consequently, there would be at most a **temporary adverse effect of Site (local lower) significance** only.

Operation

Pollution

Pollution of aquatic habitats will be prevented during operation of the Proposed Development through implementation of SuDS features as described in the Infrastructure Report and Landscape Report. Therefore, there will be **no effect** on amphibians as a result of pollution at the operation-phase.

5.6.6 Breeding birds (excluding raptors)

Construction

Disturbance or destruction of active bird nests

The bird breeding season is considered to be between March and August, inclusive. Construction works during this period and especially vegetation clearance and/or tree felling, have the potential to damage or destroy active nests containing eggs or chicks.

Two red-listed breeding species, grey wagtail and meadow pipit, could likely breed in the Site based on the habitats present and previous surveys carried out in the Clonburris SDZ. Seven amber-listed breeding species could likely breed in the Site based on the habitats present and previous surveys carried out in the Clonburris SDZ

Although the majority of relevant passerine species will lay multiple clutches of eggs each year, the loss of one brood may be significant, especially if further broods are also disrupted. Red and amber-listed birds found on the Site, already of conservation concern, could be put at further risk from these impacts.

The damage or destruction of active nests on Site would therefore constitute a **temporary adverse effect of Site (local higher) significance**.

Regardless of this assessment, it should be noted that all breeding birds are protected under the Wildlife Acts from offences including intentionally killing or injury, and disturbance during the breeding season (March to August inclusive). The protection extends to the eggs, young, and nests of birds.

Loss of breeding habitat

There will be a permanent loss of suitable habitat for breeding birds as a result of construction. However, hedgerow, treeline, and scrub will be retained within the Site where feasible and compensatory planting of scrub, hedgerows, trees, and woodland is proposed in the

Landscape Report. Consequently, the permanent loss of viable habitat for common and widespread breeding birds would result in a **permanent adverse effect of Site (local higher) significance**.

Operation

Human disturbance of retained nesting habitat and cat activity will likely increase during the operational phase of the Proposed Development, which would result in a **permanent adverse effect of Site (local lower) significance** on breeding birds.

5.6.7 Raptors (breeding/non-breeding)

Construction

Loss of habitat for raptors

The raptors that could use the Site for breeding and/or foraging are highly unlikely to have a particular dependence on the fields within the Site as such fields are widespread in the surrounding region. Raptors often prefer to forage in grassy fields with high densities of prey (e.g. small mammals), which are widespread in the surrounding region. Consequently, there is no reason to expect a particular dependence of raptors on the fields in the Site. Furthermore, the potential nesting habitat for kestrel in the Site, which include buildings, treelines, and woodland, will be largely retained and are widespread in the surrounding region. Therefore, the loss of potential raptor habitat would result in **permanent adverse effect of Site (local lower) significance**.

Disturbance of raptors

It is unlikely that raptors would rely on the habitats within the Site. If displacement of birds occurs during the construction phase, it would be offset by the availability of suitable habitat in the surrounding area.

Therefore, a **negligible effect** on raptors is expected as a result of construction disturbance.

Operation

Even though suitable nesting and foraging habitat might be retained or created, raptors will only use such habitat if habituated to the increased disturbance of the Proposed Development. Thus, raptors present on site would by definition not be materially affected by the operational phase of the Proposed Development. Therefore, a **negligible effect** on raptors is expected during the operational phase of the Proposed Development.

5.6.8 Non-breeding birds (excluding raptors)

Construction

Loss of non-breeding bird habitat

Whilst there are a wide range of hedgerows, treelines, and scrub within the surrounding area, the Site is still used by a number of non-breeding birds. For example, several notable passerine species were observed in hedgerows during non-breeding surveys in the wider Clonburris SDZ, which are widespread throughout the surrounding area. Although they are not likely to have a particular dependence on the habitats within the Site as these fields, scrub, and hedgerows/treelines, they do frequently use them, as evidenced by survey.

Therefore, the loss of habitat would result in **permanent adverse effect of Site (local lower) significance**.

Disturbance of non-breeding birds

It is unlikely that non-breeding birds would rely on the habitats within the Site. If displacement of birds occurs during the construction phase, it would be offset by the availability of suitable habitat in the surrounding area.

Therefore, a **negligible effect** on non-breeding birds is expected as a result of construction disturbance.

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Operation

Negligible effects on non-breeding birds are anticipated during the operational phase of the Proposed Development. The effects described in Section 5.5.7 are most relevant to breeding birds which are more vulnerable during the nesting season.

Fish

Construction

Pollution

Although fish are unlikely to use the Kilmahuddrick Stream and drainage ditches within the Site, construction-related pollution of these watercourses could extend downstream of the Site into the Griffeen River. Therefore, construction-related pollution of watercourses in the Site could temporality impact fish populations downstream of the Site. There are several similar streams with these fish present in the county that would not be affected by pollution of the Kilmahuddrick Stream. Adjacent populations would be expected to recover and replace any losses within the Griffeen River in the short to medium-term. Therefore, a pollution event during the construction-phase would, in a worst-case scenario, result in a **temporary adverse effect of Local (local higher) significance**.

Operation

Pollution

Pollution of aquatic habitats will be prevented during operation of the Proposed Development through implementation of SuDs features as described in the Infrastructure Report and Landscape Report. Therefore, there will be **no effect** on fish as a result of pollution at the operation-phase.

5.6.9 Invasive non-native species

Construction

Invasive flora species in Ireland that occur on Site include Japanese knotweed, Spanish bluebell, cherry laurel, butterfly-bush, sycamore, snowberry, winter heliotrope, and likely montbretia. The invasive Jenkin's spire snail may also be present in the Kilmahuddrick Stream.

There is the potential for works in the vicinity of all invasive species to cause them to be spread, for example by collecting soil contaminated with seeds or vegetative material in the tracks of machinery or in footwear. Furthermore, construction activities could also result in the indirect spread of invasive non-native species by disturbing ground and facilitating the establishment of plants.

Should construction works result in the spread of invasive non-native species, this could lead to biodiversity losses. It is assumed that inadvertent spread could be reasonably expected to occur within works areas or along transport routes in Dublin rather than beyond it, which would therefore be of **County (medium) significance**, constituting a **permanent adverse effect** (assuming no management was undertaken).

Operation

If invasive non-native plant species recorded are not removed during construction, there is potential for spread of such species during the operational phase of the Proposed Development as a result of people and/or dogs walking through infested areas and transferring seeds or vegetative propagules.

As with the construction phase, any spread of invasive non-native species during the operational period could lead to biodiversity losses, which could be of **County (medium) significance** and would constitute a **permanent adverse effect**.

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Note that it is an offence to release or allow to disperse or escape, to breed, propagate, import, transport, sell or advertise scheduled invasive species. In Irish legislation, the Wildlife Acts address invasive non-native species by stating that “anyone who plants or otherwise causes to grow in a wild state in any place in the State any species of (exotic) flora or the flowers, roots, seeds or spores of (exotic) flora shall be guilty of an offence” in Sections 52(7) and (8).

Therefore, regardless of the significance of potential ecological effects, there is a legal requirement to ensure that the Proposed Development does not result in the spread of invasive non-native species.

5.7 Cumulative impacts

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2018).

As concluded in the Appropriate Assessment Screening Report for this Proposed Development (AECOM, 2022a) that the possibility of any other plans or projects acting in combination with the Proposed Development to give rise to significant effects on any European site can be excluded.

However, for completeness and to assess potential in-combination effects on the Grand Canal pNHA and any other notable habitats and species, the overall Clonburris SDZ itself and associated infrastructure developments (Figure 1) is considered in this section as the this is the primary plan which could theoretically cause in-combination effects.

The Clonburris SDZ will involve residential developments, commercial developments, and associated roads in an area of approximately 280 ha adjacent to and surrounding the Site. It was approved by An Board Pleanála in May 2019. Furthermore, planning permission was granted for the Southern Link Road within the SDZ which would be located within 500m of the Proposed Development; Planning reference: SDZ20A/0021. This Southern Link Road bisects the Proposed Development. The application was accompanied by a report for AA Screening which concluded that the possibility of any significant effects on any European sites, whether arising from the project alone or in combination with other plans ad projects, can be excluded (Scott Cawley, 2020a). It will involve at least one stream crossing of the Kilmahuddrick Stream. In summary, the Clonburris SDZ and associated infrastructure works could potentially result in the loss of habitats adjacent to the Site and result in a considerable increase in the number of people and pets that will use the green spaces retained in the Site.

As described in Section 5.4.2, no effect on the Grand Canal pNHA is predicted as a result of the Proposed Development as it is located approximately 120 m south of the Site and it is not hydrologically connected to the Proposed Development. Furthermore, the Clonburris SDZ Planning Scheme and Clonburris SDZ Biodiversity Management Plan (Scott Cawley, 2020a; Minogue and Associates Ltd., 2017) detail objectives and actions to be put in place for development within the Site to avoid impacts upon the Grand Canal, including restrictions on activities within 50 m of the canal. Therefore, as there is considered to be no likely significant effect on the Grand Canal pNHA from the Proposed Development, it is not possible for there to be a cumulative or in-combination effect with other plans or projects.

The following ecological features that are considered in the impact assessment for the Proposed Development could be further impacted by habitat loss and/or disturbance from the overall Clonburris SDZ and associated infrastructure works: bats, otter, badger, amphibians, breeding birds, and invasive species.

However, the Clonburris SDZ Planning Scheme (Minogue and Associates Ltd., 2017) sets out ecological objectives to protect, enhance and develop interconnected green and blue infrastructure. It also sets out to connect green spaces with ecological corridors.

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Furthermore, the Clonburris SDZ Biodiversity Management Plan (Scott Cawley, 2020a) aims to mitigate any potential impacts by retaining and creating habitats as ecological corridors throughout the Clonburris SDZ, including within the Site. Therefore, although there will be a loss of primarily low-quality habitat adjacent to the Site, key ecological features are proposed to be protected and enhanced by the Clonburris SDZ Planning Scheme and the Clonburris SDZ Biodiversity Management Plan.

Bats could be impacted if the approximately 30 km of hedgerow/treeline habitats within the Clonburris SDZ lands are lost. However, as set out in the Clonburris SDZ Planning Scheme, this habitat will be primarily retained linking the Grand Canal Corridor and railway corridor for foraging and commuting bats. Any sections of hedgerows that cannot be retained will be compensated by a new hedgerow network composed of the same species will be planted along roadways in the Clonburris SDZ lands. In the Clonburris SDZ Biodiversity Management Plan, it states that hedgerow locations must be chosen to connect features of ecological value, particularly the Griffeen River, Grand Canal, railway line, existing hedgerows/treelines, and woodland. Furthermore, it states that any developments located close to a known bat roost or ecological corridor should consider incorporating enhancement measures, such as installing bat boxes, planting hedgerows, creating ponds, and planting of night-scented flowers.

Any crossings of the Kilmahuddrick Stream associated with the Clonburris SDZ Road Infrastructure Development has the potential to impact otter, however as set out in the Clonburris SDZ Planning Scheme, all construction and maintenance works will be undertaken in accordance with Inland Fisheries Ireland requirements for protection of fisheries habitat guidance and TII guidelines for crossing of watercourses guidance, which includes culvert design. Furthermore, the Clonburris SDZ Biodiversity Management Plan advises a 10 m riparian habitat buffer zone will be provided around existing and proposed rivers, streams, and wetland habitat where possible to maintain commuting and foraging routes otter.

Although the loss of habitat in the Clonburris SDZ could negatively impact badger populations, the Site is of limited value to badger due to existing human disturbance and relatively small size. Furthermore, mammal surveys must be carried out within all proposed developments for the Clonburris SDZ as per the Clonburris SDZ Biodiversity Management Plan to ensure no proposed mammals will be negatively impacted by development. Grassland and meadow habitat will also be retained and created throughout the Clonburris SDZ lands where possible. Furthermore, there are plentiful similar fields in the wider region outside of the Clonburris SDZ lands.

Pollution of watercourses from the Clonburris SDZ could impact amphibians, however the Clonburris SDZ will involve SuDS features that will protect watercourse and wetland features as set out in the Clonburris SDZ Planning Scheme and Biodiversity Management Plan.

The loss and/or disturbance of habitat for breeding birds from the Clonburris SDZ could negatively impact these species, however as described above, the Clonburris SDZ Planning Scheme and Biodiversity Management Plan sets out objectives to retain and enhance this habitat. Furthermore, the Clonburris SDZ Biodiversity Management Plan states consideration should be given to installing nest boxes within parks and development zones to accommodate a range of different species.

The spread of invasive species could occur through disturbance of habitats in the Clonburris SDZ lands. However, as stated in the Clonburris SDZ Planning Scheme no development shall take place on the lands until an Invasive Species Management and Control Plan has been prepared and implemented to prevent the introduction of any new species, prevent the movement and spread of any exiting species and eradicate any species from the lands. The Clonburris SDZ Biodiversity Management Plan also states that management must

include the removal of non-native invasive species such as butterfly-bush and filling in sparse patches with native species plantings.

Any new applications for the Proposed Development will be assessed on a case-by-case basis by South Dublin County Council.

There is a current live planning application within the SDZ in subsector S3 Clonburris South West (CSW-S3) for 569 dwellings, creche, open space and innovation hub and that at the time of this report the application is still under consideration with a request for further information requested by the planning authority.

Therefore, for the reasons outlined above, cumulative impacts from nearby proposed developments could result in **adverse effect of Local (local higher) significance** to **negligible significance** only.

5.8 Mitigation measures

5.8.1 Standard mitigation

The following are standard mitigation measures which will be implemented throughout construction of the Proposed Development. These include provisions as per the Clonburris SDZ Biodiversity Management Plan and will serve to mitigate possible effects on a range of ecological features:

- the Principal Contractor will be required to implement appropriate communications including reporting of environmental practice on-site, toolbox talks, daily briefings, an environmental noticeboard (with ecological information, spill/emergency response and refuelling area/procedure) and signage (including ecological exclusion areas);
- an Ecological Clerk of Works (ECoW) will be appointed to ensure that ecological mitigation measures are implemented;
- all site personnel involved in the construction and operation of the Proposed Development will be made aware of the ecological features present and the mitigation measures and working procedures which must be adopted. This will be achieved as part of the site induction process through the delivery of a toolbox talk. In addition, briefings will be provided to all site personnel in advance of those works which are considered to present an increased risk of impacting upon ecological features;
- best practice guidance on pollution prevention will be followed at all times during the construction and operation of the Proposed Development, including implementation of the following:
  - controls and contingency measures will be provided to manage run-off from construction areas and to manage sediment;
  - pollution prevention measures will be implemented for all construction works, but in particular where these take place within 30 m of the watercourses. These must prevent pollution (including siltation) of the watercourses;
  - there will be no direct discharge of water from any construction area into the watercourses;
  - all oils, fuels, lubricants or other chemicals will be stored in an appropriate secure container in a suitable storage area, with spill kits provided at the storage location and at places across the Site. There will be no storage of any oils, fuels, lubricants or other chemicals within 30 m of the watercourses;
  - in order to avoid potential pollution impacts to waterbodies, soils or vegetation from machinery during construction, all refuelling and servicing of vehicles and plant will be carried out in a designated area which is bunded and has an impermeable base. This will be situated at least 30 m from the watercourses;

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- the use of concrete in close proximity to watercourses will be carefully controlled to avoid spillage. No on-site batching should occur. Washout from mixing will be carried out only in a designated contained impermeable area; and,
- soil exposure during the construction works will be reduced and exposed soil will be reinstated as rapidly as possible.

- the Pollution Prevention Plan (or similar document) will include procedures and diagrams for:
  - dewatering of excavations to SuDS treatment area;
  - temporary soil storage;
  - fuel storage / refuelling;
  - concrete wash-out area;
  - controlling surface water entering Site;
  - preventing existing drainage features becoming pathways for construction run-off;
  - reducing soil exposure and reinstating as rapidly as possible;
  - temporary construction SuDS such as ditches with check dams, clean water ditches, settlement ponds, silt fencing and straw bales; and,
  - contingency measures;
- the Principal Contractor will not be permitted to use materials that could cause heavy metal, sulphide or strong acid pollution of run-off, and must use aggregates free of excessive fines / clays;
- root protection zones will be established around retained trees, in accordance with the relevant guidance. These will be clearly demarcated, and no machinery will enter these areas, nor will any material be stored within them; and,
- standard measures for protected species and wildlife in general will be implemented, including:
  - a series of relevant pre-construction walkover surveys will be undertaken by the ECoW or a suitably experienced ecologist to confirm that there is no change to the ecological baseline on Site as described in this Report;
  - sightings of protected or notable species within the Site or immediate surrounds during the construction period will be recorded. If any evidence or sightings of protected or notable species occur within 30 m of works, then works in that area will stop immediately and advice will be sought from the ECoW;
  - during the construction phase, any artificial lighting which is required (e.g. for security purposes) will be directed on to required areas and light spill will be minimised by the use of beam deflectors. Lighting will not be used such that there is light spill on to surrounding habitat which could be used by important species (e.g. by foraging or commuting bats);
  - any excavations will be left with a method of escape for any animal that may enter overnight, and will be checked at the start of each working day to ensure no animals are trapped within them;
  - any pipes will be capped or otherwise blocked at the end of each working day, or if left for extended periods of time, to ensure no animals become trapped;
  - as far as possible, construction works will be carried out in daylight (0800 to 1800 hours in general) to minimise the risk of disturbing protected species such as bats;
  - wherever possible, tree felling and vegetation removal works which will directly impact upon areas of vegetation which could be used by nesting birds will be undertaken outside the breeding season (taken to be March to August, inclusive). Where this cannot be achieved, a pre-works check for active nests will be conducted by the ECoW or a suitably experienced ornithologist. Each new construction / felling area will be checked not more than 72 hours prior to commencement of works, since nests can be quickly established. Where any active nests are identified, suitable

exclusion zone(s) will be established and maintained until the ornithologist determines that the breeding attempt(s) have concluded;

- the hydrology of the Kilmahuddrick Stream will be maintained to ensure that water levels remain stable during the construction phase;
- the Kilmahuddrick Stream will be fenced off at a minimum distance of 10 m from the watercourse bank to restrict works within this zone (with the exception of any minor works for routine maintenance, removal of invasive non-native species, and/or enhancement purposes such as native plantings); and,

- the appointed Principal Contractor will be required to comply with an Environmental Management Plan (EMP) or similar document, which will indicate ecological risks / constraints and detail all of the mitigation actions above.

5.8.2 Specific mitigation

Habitats

Removal of any existing hedgerows, treelines, native scrub and/or woodland within the Proposed Development footprint should be kept to a minimum and will be compensated by suitable tree, scrub, woodland, and hedgerow planting in the Site. The Landscape Report details the plant species composition of any proposed planted hedgerows, treelines, woodland, scrub, and meadows on Site. These are to be primarily composed of native local species where practicable (i.e. native plant species commonly found in the Clonburris SDZ). In addition, species that provide food for pollinators, such as plants that produce pollen and nectar should be included, and inclusion of berry-producing shrubs should also be included to provide food for birds.

Suitable management regimes should be devised for each compensatory habitat included within the Site, e.g. not cutting meadows overwinter, and low-level trimming hedgerows (if required) in winter. Habitat management plans detailing such measures are recommended for the operation phase of the Proposed Development.

The Kilmahuddrick Stream will be retained within the linear parkland and fenced off at a minimum distance of 10 m from the watercourse bank in order to maintain a biodiversity protection zone. A method statement will be produced for any proposed works (e.g. invasive plant species removal and/or enhancement plantings) that are required within this zone and agreed with the ECoW or a suitably experienced ecologist before works commence. Pollution prevention measures will be implemented for all construction works, but in particular where these take place within 30 m of watercourses. These must prevent pollution (including siltation) of watercourses.

Bats

The loss of bat commuting/foraging habitat will be mitigated by the proposed planting of native trees/shrub simulating the treelines, hedgerows and woodland around the Proposed Development. It can be expected that bats will utilise the compensatory planted treelines and hedgerows for foraging purposes in the short to medium-term and long-term.

No trees or structures with bat roost suitability were recorded within the Site or reported with 50 m of the Site. Therefore, no further mitigation is required for roosting bats unless a tree becomes suitable for roosting bats before the time of construction. If any trees become suitable for roosting bats, these trees should not be felled unless it is unavoidable. A suitability qualified bat ecologist should advise on any further mitigation measures, methods for felling trees with bat roost suitability and/or any potential licence requirements from the NPWS.

Lighting will be avoided near ecological features wherever possible. Where lighting is required, directional lighting will be used to prevent light spill on ecologically sensitive habitats, such as treelines, hedgerows, watercourses and woodland. Lights should be turned off during periods of darkness throughout the construction

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phase to further minimise any risk of impacts to sensitive ecological receptors outside of work hours.

Otter

The Kilmahuddrick Stream will remain present on Site and its ecological integrity will be protected (e.g. maintaining the hydrology of the stream and adjacent vegetation). It will be fenced off at a minimum distance of 10 m from the watercourse bank, which will mitigate for obstruction of commuting otter.

Section 5.8.1 provides further detail on pollution mitigation measures for watercourses.

Lighting will be avoided near ecological features wherever possible. Where lighting is required, directional lighting will be used to prevent light spill on ecologically sensitive habitats, such as treelines, hedgerows, watercourses and woodland. Lights should be turned off during periods of darkness throughout the construction phase to further minimise any risk of impacts to sensitive ecological receptors outside of work hours.

Any excavations will be left with a means of escape (such as a ramp or slope) for any otters or other animals that may enter overnight. Excavations will be checked at the start of each working day to ensure no animals are trapped within them. Alternatively, small excavations may be covered completely overnight. Any open pipes will be capped overnight to prevent entry of animals.

Badger

The same general measures to prevent entrapment of animals overnight described above for otter will be implemented for badger and other mammals (i.e. provision of means of escape from excavations or covering overnight and capping of open pipes overnight).

Amphibians

The Kilmahuddrick Stream provides suitable habitat for amphibians. To ensure the protection of common frog and smooth newt in the Kilmahuddrick Stream, the following mitigation measures will be implemented:

- preventing pollution (including siltation) of the water;
- storing any chemicals in an appropriate container in a suitable storage area;
- reducing soil exposure during the works; and,
- maintaining the hydrology of the watercourse.

Works within 30 m of the Kilmahuddrick Stream should be avoided during the breeding and spawning season for amphibians (i.e. January to July, inclusive) where possible. Section 5.8.1 provides further detail on pollution mitigation measures for watercourses.

Breeding birds

All bird species are protected under the Irish Wildlife Acts from intentional killing or injury, and disturbance during the breeding season (March to August inclusive). The protection extends to the eggs, young, and nests of birds.

Therefore, removal of woody vegetation (including scrub) to facilitate the Proposed Development should not be undertaken during the bird breeding season, where possible. If vegetation removal cannot be avoided during the breeding season, and as a last resort suitable for smaller areas of vegetation only, the ECoW or a suitably experienced ecologist will check for active bird nests prior to the clearance taking place. Where active nest(s) are found, the ecologist would establish exclusion zone(s) of appropriate size from which machinery, personnel and materials will be excluded until the nesting attempt(s) have finished. Note that the latter method of checking for active nests may result in project delays, therefore the preferred method is to carry out required vegetation clearance outside the bird breeding season.

Fish

The watercourses within the Site are connected to the Griffeen River downstream, which contains notable fish populations. To ensure the protection of fish in the

watercourses downstream of the Site, the following mitigation measures will be implemented:

- preventing pollution (including siltation) of the water;
- storing any chemicals in an appropriate container in a suitable storage area; and,
- reducing soil exposure during the works.

Section 5.8.1 provides further detail on pollution mitigation measures for watercourses.

Invasive species

Invasive species should be avoided where possible. If the proposed works cannot avoid invasive species, appropriate measures will be conducted to prevent their spread. Invasive species mitigation as set out in the Invasive Species Management Options Report for the Proposed Development will be followed (AECOM, 2022d).

5.9 Enhancement

Although described as mitigation for the loss of habitat to the construction of the Proposed Development, the planting of treelines, hedgerows, and meadows in the proposed open spaces and along roads will also represent enhancements to baseline conditions, as the majority of existing habitats are disturbed and have relatively low ecological value (e.g. species-poor grassland; invasive non-native species presence). The following additional enhancement measures are proposed:

- bird nest boxes will be installed on suitable trees in retained mature woodland and/or treelines. These will be constructed of woodcrete so as to be long-lasting, and will have a variety of entry hole sizes to suit a range of species. Types, numbers, and suitable locations will be determined during the detailed design;
- specially constructed nest boxes suitable for use by swifts, house martins and swallows will be installed on buildings. Types, numbers, and suitable locations will be determined during the detailed design. Note that these are recommended for community and other non-residential buildings, to avoid potential conflict with future homeowners;
- externally placed bat boxes will be installed on suitable trees in retained mature woodland and/or treelines. These will include a range of sizes to support a variety of species and roost types. Types, numbers, and suitable locations (e.g. avoiding illuminated areas) will be determined during the detailed design. A suitably experienced ecologist or ECoW will assist in the placement of these boxes;
- integrated bat boxes / bricks will be installed within buildings. Types, numbers, and suitable locations (e.g. avoiding illuminated areas) will be determined during the detailed design. Note that these are recommended for community and other non-residential buildings, to avoid potential conflict with future homeowners;
- hedgehog hibernation features will be created using brash and other material generated during tree felling / scrub clearance;
- insect refugia (e.g. 'insect hotels', log piles) will be created and included within the linear park and community green. Types, styles, numbers, and suitable locations to be determined during detailed design; and,
- planting in the Site should comprise native local species that provide food for pollinators, such as plants that produce pollen and nectar throughout the year. Berry-producing shrubs should also be included to provide food for birds.

5.10 Residual effects

Prior to the implementation of mitigation and/or enhancement measures, adverse effects on several ecological features were identified, mostly of Site (local lower) significance only but rising to County (medium) significance for effects on invasive non-native species. The pre-mitigation non-negligible effects on ecological

5. Impact assessment

features are summarised in Table 7. The general and specific mitigation measures proposed above to avoid, minimise or compensate for these effects are also outlined in this table. The residual effects are stated in the final column of Table 7 and consider the proposed mitigation measures.

Following implementation of the general and specific mitigation and/or enhancement measures proposed above, residual impacts for habitat loss and loss of habitat breeding birds are permanent adverse of Site (local lower) significance, and all residuals are **no effect or negligible**.

5. Impact assessment

Table 7. Summary of adverse ecological effects and mitigation/ enhancement

Ecological feature	Description of impact	Pre-mitigation effect	Mitigation / enhancement	Residual effect
Habitats	Permanent loss of hedgerows/treelines during construction	Permanent adverse effect of Site (local lower) significance	The Landscape Report includes planting of native trees and hedgerows within the Site.	Permanent adverse effect of Site (local lower) significance
	Permanent loss of other habitat during construction	Permanent adverse effect of Site (local lower) significance	Grassland reinstatement includes native meadow in the linear parkland within the Site. Both the above provide compensatory habitat but also represent minor enhancements.	Permanent adverse effect of Site (local lower) significance
	Pollution impacts during construction on nearby habitats during construction	Temporary adverse effect of Local (local higher) significance	A range of standard pollution prevention measures will be implemented as listed in Section 5.8.1. Permanent drainage design will also incorporate measures to prevent release of pollutants to the environment.	No effect
Bats	Loss of foraging/commuting habitat during construction	Permanent adverse effect of Site (local lower) significance	Compensatory planting of native trees and hedgerows in the Site simulating natural treelines, hedgerows and woodland.	Negligible effect
	Disturbance of foraging/commuting bats during operation	Permanent adverse effect of Site (local lower) significance	No lighting is proposed within the parks. Lighting will be present in the wider Site. Construction works will be primarily carried out in daylight to minimise risk of disturbing bats.	Negligible effect
Otter	Loss or disturbance of commuting habitat during construction	Temporary adverse effect of Local (local higher) significance	The Kilmahuddrick Stream will remain on Site and will not be subject to lighting. Construction works will be primarily carried out in daylight and lights will be turned off at night.	No effect
	Disturbance or injury to commuting otter during construction	Temporary adverse effect of County (medium) significance	Any excavation will be left with a means of escape and open pipes will be covered overnight to prevent otter from being trapped.	No effect
	Disturbance of commuting otters during operation	Permanent adverse effect of Local (local higher) significance	The Kilmahuddrick Stream will remain on Site and there will be no lighting at the Kilmahuddrick Stream.	No effect
Badger	Loss or disturbance of commuting / foraging habitat during construction	Permanent adverse effect of Local (local higher) significance	The Landscape Report includes planting to compensate habitat loss. Linear features will encourage badger to that area.	Negligible effect

5. Impact assessment

Ecological feature	Description of impact	Pre-mitigation effect	Mitigation / enhancement	Residual effect
	Disturbance or injury to commuting/foraging badger during construction	Temporary adverse effect of Local (local higher) significance	Any excavation will be left with a means of escape and open pipes will be covered overnight to prevent otter from being trapped.	No effect
Amphibians	Construction-related pollution of aquatic habitats during construction	Temporary adverse effect of Local (local higher) significance	A range of standard pollution prevention measures will be implemented as listed in Section 5.8.1.	No effect
	Disturbance or injury to amphibians during construction	Temporary adverse effect of Site (local lower) significance	Works within 30 m of the Kilmahuddrick Stream should be avoided during the breeding and spawning season for amphibians where possible.	Negligible effect
Breeding birds	Disturbance or destruction of active bird nests during construction	Temporary adverse effect of Site (local lower) significance	Where possible, all vegetation clearance works will take place during the non-breeding season. Where this is not possible, a pre-works check for nesting birds will be carried out by a suitably experienced ecologist. Any active bird nest(s) identified will be clearly demarcated and suitable exclusion zone(s) established until the breeding attempt(s) have finished.	Negligible effect
	Permanent loss of nesting habitat during construction	Permanent adverse effect of Site (local lower) significance	Compensatory planting of native treelines/hedgerows in the Site simulating natural treelines, hedgerows, and woodland which will be viable as nesting habitat in the short to medium term. Installation bird boxes on retained woodland and treelines and installation of ten nest boxes on buildings.	Permanent adverse effect of Site (local lower) significance
	Disturbance during operation	Permanent adverse effect of Site (local lower) significance	As described above, compensatory planting and installation of bird boxes will result in a positive effect on breeding birds in Site. Therefore, any minimal impacts on breeding birds from increased human disturbance during operation will have a negligible effect on the baseline breeding bird populations.	Negligible effect
Fish	Construction-related pollution of aquatic habitats during construction	Temporary adverse effect of Local (local higher) significance	A range of standard pollution prevention measures will be implemented as listed in Section 5.8.1.	No effect
Invasive non-native species	Spread of invasive species during construction	Permanent adverse effect of	Avoid invasive species where possible. If invasive species cannot be avoided appropriate measures should be	No effect

5. Impact assessment

Ecological feature	Description of impact	Pre-mitigation effect	Mitigation / enhancement	Residual effect
(flora and fauna)		County (medium) significance	conducted to prevent their spread. The Invasive Species Management Options Report (AECOM, 2022d) should be adhered to for invasive species on Site.	
	Spread of invasive species during operation	Permanent adverse effect of County (medium) significance	Avoid invasive species where possible. If invasive species cannot be avoided appropriate measures should be conducted to prevent their spread. The Invasive Species Management Options Report (AECOM, 2022d) should be adhered to for invasive species on Site.	No effect

5. Impact assessment

5.11 Monitoring

It should be verified that the specific proposed mitigation measures have been implemented and that planting/sowing is establishing correctly. The monitoring measures in this section also had regard for the Clonburris SDZ Biodiversity Management Plan (Scott Cawley, 2020a). The planting/sowing measures are also landscape mitigation which require checks for compliance and establishment on that basis.

Regarding the implementation of mitigation measures, it should be verified that:

- the stipulated native tree/shrub species have been planted, and that they are establishing appropriately. If establishment is not proceeding as expected an investigation into the cause(s) should be carried out and remedial action taken;
- the native grassland mixes are provided and that they are establishing appropriately. If establishment is not proceeding as expected an investigation into the cause(s) should be carried out and remedial action taken;
- the minimum exclusion zone of 10 m around the Kilmahuddrick Stream is implemented;
- no artificial lighting is directed onto important ecological features, such as hedgerows, treelines, watercourses, and woodland; and,
- the various pollution prevention measures are implemented.

Furthermore, all artificial bat boxes and bird boxes installed on Site should be monitored every two years by a suitably qualified ecologist (under NPWS derogation) to check for usage and to maintain the boxes as needed.

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7. Figures

Drawing title *Masterplan – Site Plan* for Clonburris Phase One (produced by Metropolitan Workshop)

Figure 1 – Site location

Figure 2 – European and national sites

Figure 3 – Habitats

Figure 4 – Invasive non-native species

263 Total Units

Key

- Community
- Bungalow
- 2 Storey House
- 3 Storey House
- Apartment
- Duplex
- Parkside Apartment
- Services / Bin Store

N

Site Plan - Ground Floor

1 : 1000

STAGE 2

Revision	Date	Description	Issued	Checked
P1	15.03.2022	Issued for Pre-Part 8 Planning Application	OB	SC
P2	06.04.2022	Issued for Part 8 Coordination	DK	SC

Comhairle Contae Átha Cliath Theas
South Dublin County Council

Notes

Do not scale drawings. All dimensions should be checked on site. Errors to be reported to architect. To be read in conjunction with all relevant architects services and engineers drawings.

Contractors, sub-contractors and suppliers must verify any critical dimensions on site prior to fabrication of any building element. Any discrepancies are to be reported o the architect.

This drawing should be read in conjunction with all relevant specifications, engineers nd specialists consultants information. Any discrepancies must be reported prior to installation.

DRAFT

- Site Boundary
- CIL Link Street Planning Application Boundary
- SDCC Lands
- Plot Boundary
- Existing Accommodation Boundary
- Existing Road Line
- Proposed ESB Substation Locations

Metropolitan Workshop
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Project:	Clonburris Phase One
Client:	SDCC
Location	Clonburris Co.Dublin
Title:	Masterplan -Site Plan
Current Revision Issue Date:	06.04.2022
Scale:	As indicated @ A1

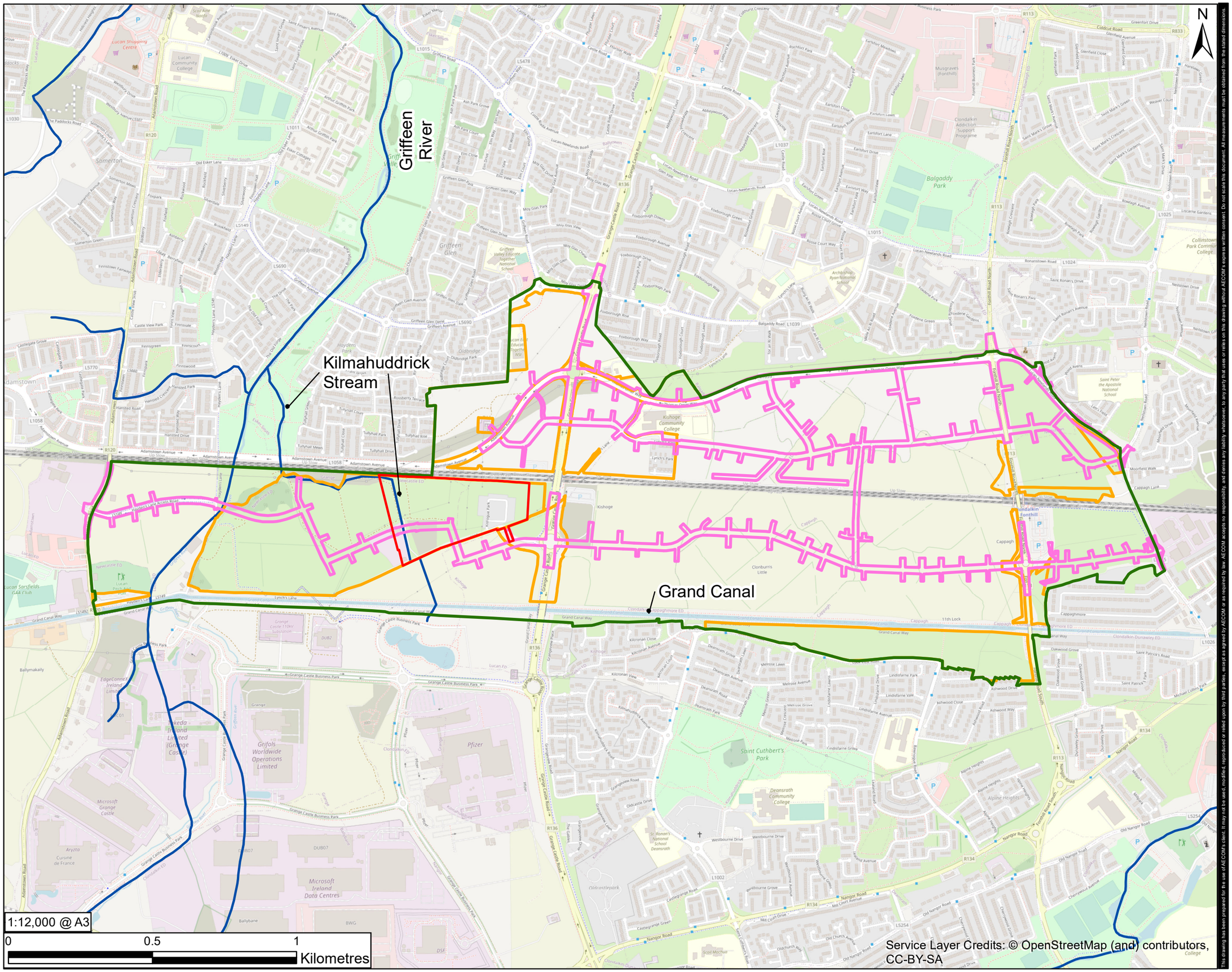
Drawing Number:	Project	Originator	Volume	Level	Type	Role	Reference	Suitability	Revision
	2015	MET	ZZ	00	DR	A	101101	S2	P2

MW BIM Suitability Codes: A1, A2, An, etc. – Approved and accepted as Stage Complete, B1, B2, Bn, etc. – Partially signed-off, CR – As Construction Record documentation, S0 - Initial status or WIP, S1 - Suitable for Coordination, S2 - Suitable for Information, S3 - Suitable for Review & Comment, S4 - Suitable for Stage Approval, S6 – Suitable for PIM Authorisation (Information Exchanges 1-3), S7 – Suitable for AIM Authorisation (Information Exchange 6)

7. Figures

Drawn: LC Checked: DG Approved: TM Date: 21/09/2021

Revision: 0



AECOM

PROJECT

Clonburris Phase One

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LEGEND

- Clonburris Phase One boundary (Site)
- Clonburris Strategic Development Zone (SDZ) boundary
- Clonburris Road Infrastructure Development
- South Dublin County Council (SDCC) Masterplan Area
- Watercourses

PROJECT NUMBER

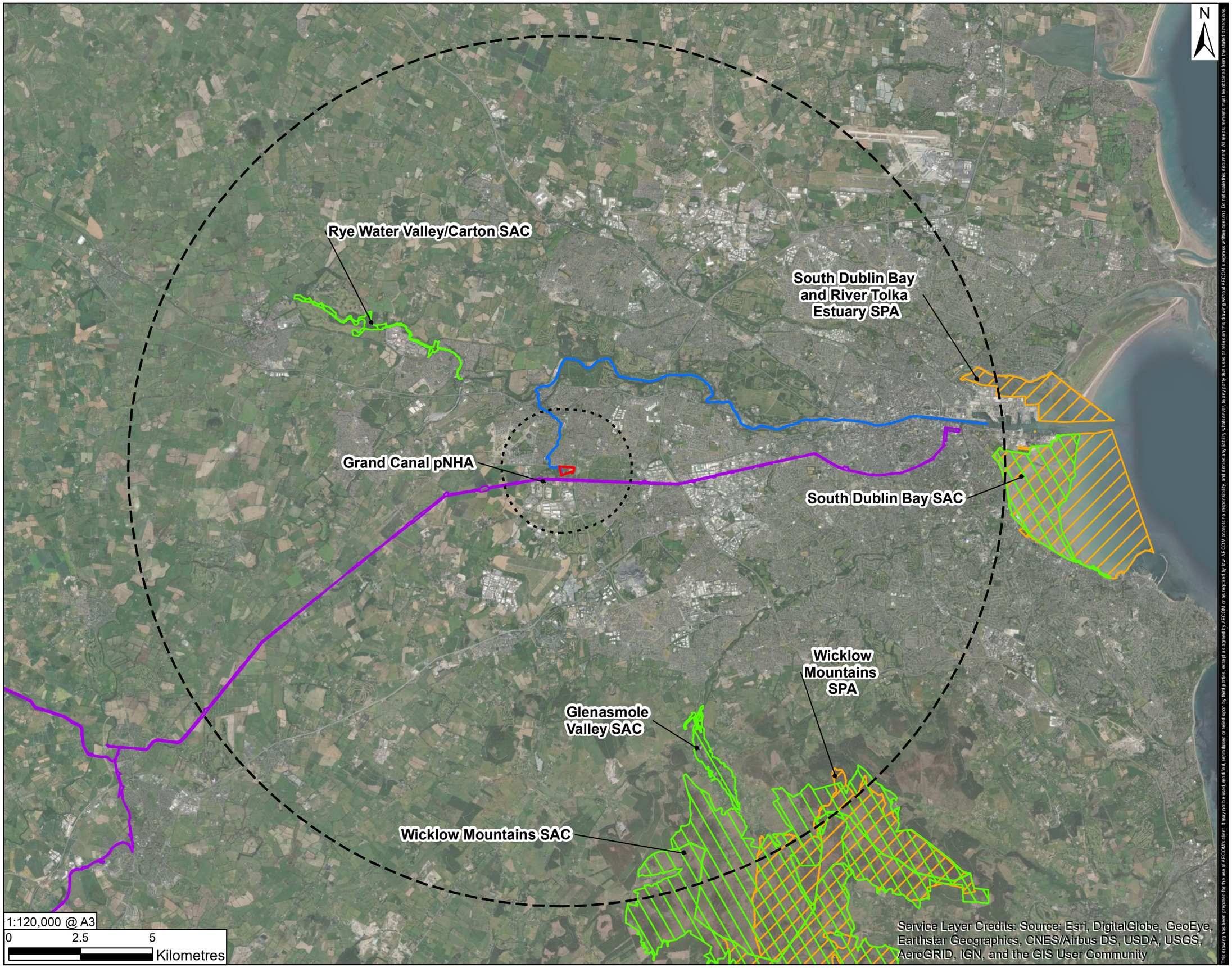
60650394

FIGURE NUMBER

Figure 1

Drawn: LC Checked: DG Approved: TM Date: 21/09/2021

Revision: 0



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LEGEND

- Clonburris Phase One boundary (Site)
- 2 km radius around Site
- 15 km radius around Site
- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- Proposed Natural Heritage Areas (pNHA)
- Watercourses downstream of Site

PROJECT NUMBER

60650394

FIGURE NUMBER

Figure 2

Drawn: LC Checked: DG Approved: TM Date: 21/09/2021

Revision: 0

AECOM

PROJECT

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LEGEND

- Clonburris Phase One boundary (Site)
- 50 m around Site
- Predominately hardstanding area (not surveyed)
- Kilmahuddrick Stream

Habitat type (Fossitt) Linear features:

- FW4 - Drainage ditches
- WL1 - Hedgerows
- WL2 - Treelines

Habitat type (Fossitt) Polygon features:

- BL3 - Buildings and artificial surfaces
- BL3/ED3/WS1 - Buildings and artifical surfaces / Recolonising bare ground / Scrub
- ED3/WS1 - Recolonising bare ground / Scrub
- GA1 - Improved agricultural grassland
- GA1/GS2/WS1 - Improved agricultural grassland / Dry meadows and grassy verges / Scrub
- GS2 - Dry meadows and grassy verges
- WD1 - (Mixed) broadleaved woodland
- WD1/WD2 - (Mixed) broadleaved woodland / Mixed broadleaved/conifer woodland
- WS1 - Scrub
- WS2 - Immature woodland

PROJECT NUMBER

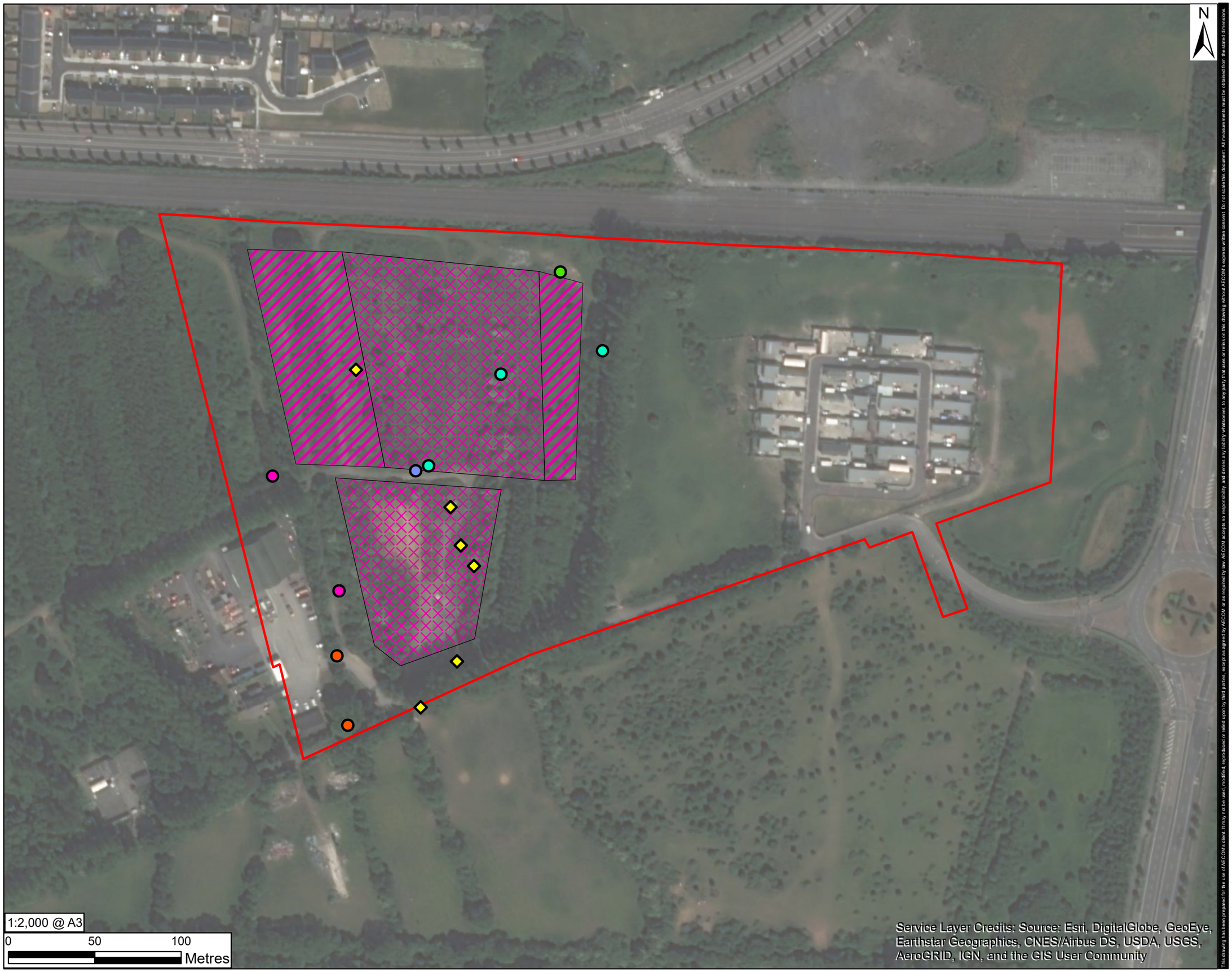
60650394

FIGURE NUMBER

Figure 3

Drawn: LC Checked: DG Approved: TM Date: 21/09/2021

Revision: 0



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LEGEND

Clonburris Phase One boundary (Site)

Invasive non-native plants (recorded by SDCC)

Point features:

Japanese knotweed (scheduled)

Invasive non-native plants (identified by AECOM in April and August 2021)

Point features:

Butterfly-bush (medium-impact, non-scheduled)

Cherry laurel (high-impact, non-scheduled)

Snowberry (low-impact, non-scheduled)

Spanish bluebell (scheduled)

Winter heliotrope (low-impact, non-scheduled)

Polygon features:

Butterfly-bush (dense and continous)

Butterfly-bush (sparse and scattered)

PROJECT NUMBER

60650394

FIGURE NUMBER

Figure 4

Appendix A

NBDC desk study results

Table A.1. Notable species records returned by NBDC within 2 km of the Site

Taxon	Species	Scientific name	Conservation designation(s)
Amphibian	Common frog	*Rana temporaria*	WA
	Smooth newt	*Lissotriton vulgaris*	WA
Bird	Barn owl	*Tyto alba*	WA, BoCCI Red List
	Barn swallow	*Hirundo rustica*	WA, BoCCI Amber List
	Black-headed gull	*Larus ridibundus*	WA, BoCCI Amber List
	Brambling	*Fringilla montifringilla*	WA, BoCCI Amber List
	Common coot	*Fulica atra*	WA, BoCCI Amber List
	Common snipe	*Gallinago gallinago*	WA, BoCCI Red List
	Corn crake	*Crex crex*	WA, BoCCI Red List
	Curlew	*Numenius arquata*	WA, BoCCI Red List
	Eurasian oystercatcher	*Haematopus ostralegus*	WA, BoCCI Red List
	Eurasian teal	*Anas crecca*	WA, BoCCI Amber List
	Eurasian wigeon	*Anas penelope*	WA, BoCCI Red List
	Gadwall	*Anas strepera*	WA; BoCCI Amber List
	Golden plover	*Pluvialis apricaria*	WA; BoCCI Red List
	Goldcrest	*Regulus regulus*	WA; BoCCI Amber List
	Goosander	*Mergus merganser*	WA; BoCCI Amber List
	Great cormorant	*Phalacrocorax carbo*	WA; BoCCI Amber List
	Great crested grebe	*Podiceps cristatus*	WA; BoCCI Amber List
	Great spotted woodpecker	*Dendrocopos major*	WA; BoCCI Amber List
	Greenfinch	*Carduelis chloris*	WA; BoCCI Amber List
	Grey partridge	*Perdix perdix*	WA; BoCCI Red List
	Grey wagtail	*Motacilla cinerea*	WA; BoCCI Red List
	Herring gull	*Larus argentatus*	WA, BoCCI Amber List
	House martin	*Delichon urbicum*	WA; BoCCI Amber List
	House sparrow	*Passer domesticus*	WA; BoCCI Amber List
	Kestrel	*Falco tinnunculus*	WA; BoCCI Red List

Appendix A –

NBDC desk study results

Taxon	Species	Scientific name	Conservation designation(s)
	Kingfisher	*Alcedo atthis*	BirdsDir A1; WA; BoCCI Amber List
	Lapwing	*Vanellus vanellus*	WA; BoCCI Red List
	Linnet	*Linaria cannabina*	WA; BoCCI Amber List
	Linnet	*Linaria cannabina*	WA; BoCCI Amber List
	Little egret	*Egretta garzetta*	BirdsDir A1; WA
	Mallard	*Anas platyrhynchos*	WA; BoCCI Amber List
	Meadow pipit	*Anthus pratensis*	WA; BoCCI Red List
	Merlin	*Falco columbarius*	WA; BoCCI Amber List
	Mew gull	*Larus canus*	WA; BoCCI Amber List
	Mute swan	*Cygnus olor*	WA; BoCCI Amber List
	Peregrine	*Falco peregrinus*	BirdsDir A1; WA
	Pintail	*Anas acuta*	WA; BoCCI Red List
	Pochard	*Aythya ferina*	WA; BoCCI Red List
	Red grouse	*Lagopus lagopus*	WA; BoCCI Red List
	Redshank	*Tringa totanus*	WA; BoCCI Red List
	Redwing	*Turdus iliacus*	WA; BoCCI Red List
	Sand martin	*Riparia riparia*	WA, BoCCI Amber List
	Skylark	*Alauda arvensis*	WA, BoCCI Amber List
	Spotted flycatcher	*Muscicapa striata*	WA, BoCCI Amber List
	Starling	*Sturnus vulgaris*	WA; BoCCI Amber List
	Stock pigeon	*Columba oenas*	WA; BoCCI Amber List
	Swift	*Apus apus*	WA; BoCCI Red List
	Tree sparrow	*Passer montanus*	WA; BoCCI Amber List
	Tufted duck	*Aythya fuligula*	WA, BoCCI Red List
	Whooper swan	*Cygnus cygnus*	BirdsDir A1; WA; BoCCI Amber List
	Willow warbler	*Phylloscopus trochilus*	WA; BoCCI Amber List
	Woodcock	*Scolopax rusticola*	WA; BoCCI Red List
	Yellowhammer	*Emberiza citrinella*	WA; BoCCI Red List

Appendix A –

NBDC desk study results

Taxon	Species	Scientific name	Conservation designation(s)
Invertebrate - bee	Buffish mining bee	*Andrena nigroaenea*	VU
	Moss carder-bee	*Bombus muscorum*	NT
	Small sallow mining bee	*Andrena praecox*	VU
	Trimmer's mining bee	*Andrena trimmerana*	CR
Invertebrate - butterfly	Dingy skipper	*Erynnis tages*	NT
	Small blue	*Cupido minimus*	EN
	Small heath	*Coenonympha pamphilus*	NT
	Wall	*Lasiommata megera*	EN
Invertebrate - mollusc	Globular pea mussel	*Pisidium hibernicum*	NT
	Iridescent pea mussel	*Pisidium pulchellum*	EN
	Jenkin's spire snail	*Potamopyrgus antipodarum*	Med Inv
Mammal - bat	Brown long-eared bat	*Plecotus auritus*	HabDir; WA
	Common pipistrelle	*Pipistrellus pipistrellus*	HabDir; WA
	Daubenton's bat	*Myotis daubentonii*	HabDir; WA
	Leisler's bat	*Nyctalus leisleri*	HabDir; WA
	Soprano pipistrelle	*Pipistrellus pygmaeus*	HabDir; WA
Mammal - other	Brown rat	*Rattus norvegicus*	High Inv
	Eastern grey squirrel	*Sciurus carolinensis*	High Inv
	Eurasian pygmy shrew	*Sorex minutus*	WA
	European otter	*Lutra lutra*	HabDir; WA
	European rabbit	*Oryctolagus cuniculus*	Med Inv
	West European hedgehog	*Erinaceus europaeus*	WA
Plant	Canadian waterweed	*Elodea canadensis*	High Inv
	Green figwort	*Scrophularia umbrosa*	NT
	Himalayan balsam	*Impatiens glandulifera*	Sch Inv; High Inv
	Opposite-leaved pondweed	*Groenlandia densa*	FPO; NT
	Russian-vine	*Fallopia baldschuanica*	Med Inv

Appendix A –

NBDC desk study results

Taxon	Species	Scientific name	Conservation designation(s)

HabDir – Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora ('Habitats Directive');

BirdsDir A1– Annex 1 of the Directive 2009/147/EC on the conservation of wild birds ('Birds Directive').

WA – The Wildlife Acts 1976 to 2018 and the Wildlife (Amendment) Act 2000 ('Wildlife Acts').

FPO – Flora Protection Order.

IFA – Irish Fisheries Acts

BoCCI Red List – Birds of Conservation Concern in Ireland on the Red List.

BoCCI Amber List – Birds of Conservation Concern in Ireland on the Amber List.

Irish Red List status (CR - Critically Endangered, EN - Endangered, VU - Vulnerable, NT - Near Threatened, DD - Data deficient).

Sch Inv - Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) (as amended).

High Inv – high-impact invasive species in Ireland; Med Inv – medium-impact invasive species in Ireland