Kelland Homes Ltd.

Ecological Impact Assessment (EcIA)

Clonburris, K1, Dublin

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EXECUTIVE SUMMARY

- Ecological surveys were previously carried out by Scott Cawley as part of an Environmental Assessment Impact Report (EAIR) for Clonburris Strategic Development Zone (SDZ), a site of ca. 280 ha located in west Dublin. RSK (Ireland) Ltd. were commissioned to conduct further surveys for the Ecological Impact Assessment (EcIA) of a site for a proposed development of ca. 6.3 ha at the eastern end of the SDZ, between the R113 and the Ninth Lock Road, in proximity to Clondalkin Fonthill train station. This included confirmation of the Fossitt habitat types, an invasive non-native species (INNS) survey, a badger survey, an assessment of habitats suitable for breeding birds and amphibians and a bat roost potential assessment of the trees and buildings on the site. These surveys were conducted by Blackstaff Ecology Ltd. on 8th and 13th April 2022. The findings are included in this EcIA.
- Surveys for activity and emergency/re-entry for bats, Habitat suitability surveys for smooth newts and breeding birds surveys were all recommended following the initial walkover, conducted in April 2022. Active bat surveys on site showed the site is of low importance for commuting and foraging bats. During the emergence and re-entry surveys, 4 potential bat emergences were recorded from previously described Potential Bat Roosts (PRFs) at Cappagh House. Aerial roost surveys showed that none of the trees were currently in use as bat roosts.
- Due to the unsuitable nature of the ponds available on site, lacking any aquatic vegetation, and no documented newt activity, the site is considered unsuitable for breeding newts. The Breeding Bird Survey recorded 29 bird species on or near site, 4 of these being species of medium Conservation Concern within the Birds of Conservation Concern in Ireland (BoCCI) list 2020-2026, namely; - barn swallow (*Hirundo rustica*), starling *(Sturnus vulgaris),* lesser black backed gull *(Larus fuscus)* and herring gull (*Larus argentatus*).
- The Fossitt habitats on site were mapped and consist of hedgerows (WL1), dry meadow and grassy verges (GS2), stone walls (BL1), recolonising bare ground (ED3), earth bank (BL2), spoil and bare ground (ED2), recently felled woodland (WS5) and drainage ditches (FW4). No habitats listed in Annex I of the Habitats Directive were identified on site. No protected flora were identified on site. Species of note include a sizeable population of cowslips and a small population of primroses. Several lengths of hedgerow had been recently cleared and certain other parts of hedgerow had been severely cut back. An area of woodland had been recently cleared around an old ruin and areas of scrub removed.
- No regulated INNS were found within the survey area. However, four moderate to high impact invasive species were found to be present on the site – cherry laurel, butterfly bush, snowberry and piri-piri burr. Previously to this report, Japanese knotweed was identified by an earlier walkover assessment. The knotweed was treated but not removed in 2021 and 2022, and will be removed under SDZ20A/002. Further information about the mitigation, management and removal of invasive plant species in site can be found within the Biodiversity Management Plan (RSK BMP, 2022).
- An assessment was made of key ecological receptors on the Site and the likely impacts of the proposed development are expected to be negligible or minor post-construction if the recommended mitigation measures are applied. The Biodiversity Management Plan (BMP)

further expands on the summarised recommendations to help mitigate any potential impacts arising from the development.

1.0 INTRODUCTION

1.1 Background

1.1.1 Blackstaff Ecology Ltd was appointed by RSK (Ireland) Ltd. on behalf of their client Kelland Homes Ltd, to undertake an Ecological Impact Assessment (EcIA) of a proposed housing development at the eastern end of Clonburris Strategic Development Zone, in compliance with the EIA Directive (Directive 2011/92/EU), as amended by Directive 2014/52/EU.

1.1.2 Kelland Homes Ltd. intends to apply for permission for development on a site area of 6.3Ha, on lands within the townland of Cappagh, Dublin 22. The proposed development is located west of the Ninth Lock Road, south of the Dublin-Cork railway line, north of Cappaghmore housing estate and Whitton Avenue, and east of an existing carpark / park & ride facility at the Clondalkin Fonthill train station and the R113 (Fonthill Road). The proposed development is located within the Clonburris Strategic Development Zone (SDZ), within the development areas of (i) Clonburris South East (i.e. CSE-S1 & CSE-S2) and (ii) part of Clonburris Urban Centre (i.e. CUC-S4), as identified in the Clonburris SDZ Planning Scheme 2019.

1.1.3 The proposed development consists of the construction of 283 no. dwellings, crèche and 3 no. retail / commercial units. The proposed residential dwellings are comprised of (i) 112 no. 2, 3 & 4 bed, 2 storey semi-detached and terraced houses, (ii) 110 no. 1, 2 & 3 bed duplex units accommodated in 11 no. 3 storey buildings, and (iii) 61 no. 1 & 2 bedroom apartments accommodated in 2 no. apartment buildings (i.e. Block A which is a 3-6 storey building & Block B is a 4 storey building). The ground floor of Block A accommodates a retail/commercial unit (c.325sq.m) and a creche (c.599sq.m). 2 no. retail/commercial units are also proposed at ground & first floor level of Block K (totalling c.152sq.m).

1.1.4 Access to the development will by via the permitted road network (under Ref. SDZ20A/0021) which provides access from the Ninth Lock Road to the east and the R113 (Fonthill Road) to the west. The proposed development will connect into the permitted infrastructural works as approved under the Clonburris Strategic Development Zone Planning Scheme (2019) and permitted under Ref. SDZ20A/0021, with the proposed development connecting into the permitted surface water drainage attenuation systems i.e. 1 no. pond, 3 no. modular underground storage systems and 1 no. detention basin combined with modular underground storage systems. The proposed wastewater infrastructure will connect into a permitted foul pumping station and pipe network within proposed road corridors to facilitate drainage connections to future wastewater drainage infrastructure within the adjoining SDZ lands (including future Irish Water pumping station permitted under SDZ21A/0006).

1.1.5 The proposed development also provides for all associated site development works above and below ground, public & communal open spaces, hard & soft landscaping and boundary treatments, car parking & bicycle parking, bin & bicycle storage, signage, public lighting, plant (M&E), utility services & ESB sub-stations.

1.1.6 Permission to demolish Cappagh House has been granted under a separate planning application despite the building being within this project's site boundary, however bat

surveys were not completed to inform this application. During the PEA suitable PRFs were identified and therefore emergence and re-entry surveys were conducted on the building, the results of which are summarised within this document. The full results of bat surveying at Clonburris can be found within the Bat Report (RSK Bat Report, 2022)

1.2 Statement of authority

1.2.1 Preliminary field surveys were conducted by Dr Florentine Spaans BSc MSc PhD MRSB. This report was prepared by Florentine, reviewed by Dr Brian Sutton BSc PhD CEnv MCIEEM and approved by Cormac Loughran MSc CEnv MCIEEM.

1.2.2 Dr Spaans was awarded a PhD in Ecology by Queen's University, Belfast and an MSc in the biodiversity and taxonomy of plants by RBGE/University of Edinburgh. Prior to working at Blackstaff Ecology, she worked as a Plant Health Inspector in Forest Service for 3 years. She also worked as a research assistant at Queen's University, Belfast and has been responsible for fieldwork and sampling for various ecological projects. She has experience doing multiple PEAs, invasive species surveys and Phase 2 surveys for a wide range of habitats as an ecologist. She has been involved in several habitat management and enhancement projects on upland sites around windfarms. During her time at Blackstaff, she has also done AA screening reports and Natura Impact Statements for various projects across Ireland.

1.2.3 Dr Sutton was awarded a PhD in Environmental Science by the University of Ulster. Prior to working at Blackstaff Ecology, he worked as a member of the Habitat Survey Team of the Environment and Heritage Service (now the Northern Ireland Environment Agency) for two years. Following this, he worked as a consultant ecologist for AECOM Ltd for 15 years, carrying out habitat, bird and mammal surveys for a wide range of governmental and private clients. He has produced numerous EcIAs and PEAs, both during his time at AECOM and for Blackstaff Ecology. He has carried out HRA, both at Screening and Appropriate Assessment level, for numerous schemes, at a range of scales, from small private developments to major infrastructure projects. He has also prepared Strategic Environmental Assessments for a number of government plans. Brian has been a Principal Ecologist at Blackstaff Ecology for the past six years.

1.2.4 Cormac Loughran is a Chartered Environmentalist (CEnv) and a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Cormac has worked professionally as a Consultant Ecologist for the past twelve years. He holds an MSc (Distinction) in Environmental Management from the University of Ulster and has extensive experience in a broad range of flora and fauna surveys. He has undertaken and coordinated the EcIAs for numerous infrastructure developments. Cormac is also an experienced field naturalist and prior to his consultancy work, he worked as a warden/ranger for The National Trust on a number of important nature reserves between 1995 and 2004. These included Crom Estate in County Fermanagh and Murlough NNR and Slieve Donard in County Down. Cormac therefore also has a wide range of habitat management experience including broadleaved woodland, wetland, dune grassland, wet and dry heathland and blanket bog.

1.2.5 Maeve has a BA (Hons) in Zoology (1st class) from Trinity College Dublin, and an MSc in Ecological Management and Conservation Biology (Distinction) from Queen's University Belfast. Maeve is also an active volunteer and advocates for the protection of biodiversity.

Working with the North Down Red Squirrel and Pine Marten Group, she has experience in protected species surveys and INNS prevention and eradication strategies, in particular grey squirrel control measures. She also participated in the Green at Queens programme 2020, for which she gained additional experience in badger, amphibian and bird surveying. Furthermore, Maeve undertook the role of Events Officer for the DU Zoological Society 2018/2019,

1.2.6 Áine has a BSc (Hons) Animal Behavior and Biology, University of Chester. MSc Ecological Management and Conservation Biology, Queens University Belfast. She is a volunteer with Seal Rescue Ireland which has allowed me to develop the skills to capture and transport large mammals. During lock down, she completed the National Bat Monitoring Programme (NBMP), "Using your Ears", the Introductory Bat Detector Workshop NBMP level, an Introductory Bat Detector Workshop, the British Trust of Ornithology (BTO) Bird ID Basic Training. She also is involved with Rostrevor Red Squirrel Group

1.2.7 Robyn Maby has a BSocSci in Social Anthropology from the University of Manchester and is currently studying for an MSc in Ecological Management and Conservation Biology at Queen's University Belfast. Robyn worked for several years at a conservation charity. She is currently doing a student work placement at RSK and has assisted on numerous bat surveys.

1.2.8 Éinne has been working as an ecologist since graduating from his MSc in marine biology from UCC in 2020. He also has a BA in Zoology from Trinity College Dublin. He has worked extensively as a field ornithologist, bat surveyor, herpetologist and marine mammal observer during this time. He also works on a voluntary basis with the Herpetological Society of Ireland.

1.3 Relevant legislation

European Legislation

1.3.1 The Habitats Directive (together with the Birds Directive) forms the cornerstone of Europe's nature conservation legislation within the EU. It is built around two pillars: the Natura 2000 network of protected sites and a strict system of species protection. The Directive protects over 1,000 animal and plant species and over 200 "habitat types" (e.g. defined types of forests, meadows, wetlands, etc.), which are of European importance. The EU Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC), which were transposed into Irish law as S.I. No. 94/1997 Communities (Birds and Natural Habitats) Regulations 1997, recognise the significance of protecting rare and endangered species of flora and fauna, and their habitats. The amended Birds Directive was codified as Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds. The 1997 Regulations and their amendments were subsequently revised and consolidated in S.I. No. 477/2011-European Communities (Birds and Natural Habitats) Regulations 2011. This legislation requires the establishment and conservation of a network of sites of particular conservation value that are to be termed 'European Sites'. Where a scheme has the potential to have an effect on a European site or its conservation objectives, the scheme must undergo the process of Appropriate Assessment, and, where necessary, amended to ensure that any effects are not significant.

1.3.2 Annex I of the Habitats Directive lists habitat types the conservation of which requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory are also listed in Annex I. Annex II of the Directive lists animal and plant species (e.g. marsh fritillary, Atlantic salmon, and Killarney fern) whose conservation also requires the designation of SACs. Annex IV lists animal and plant species in need of strict protection and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex V include Irish hare, common frog and pine marten. Species can be listed in more than one Annex, as is the case with otter and lesser horseshoe bat which are listed in both Annex II and Annex IV.

1.3.3 Council Directive 2009/147/EC (the Birds Directive) on the conservation of wild birds instructs Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3). A subset of bird species has been identified in the Directive and these are listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction; vulnerability to specific changes in their habitat; and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and designated for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

National Legislation

1.3.4 The Wildlife Act, 1976-2017 (S.I. No. 166 of 2017), is the principal mechanism for the legislative protection of wildlife in Ireland. The Wildlife Act provides strict protection for species of conservation value. The Wildlife Act protects species from injury, disturbance and damage to breeding and resting sites. These species are therefore considered in this report as ecological receptors. Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) are heritage sites that are designated for the protection of flora, fauna, habitats and geological sites. Only NHAs are designated under the Wildlife (Amendment) Act 2017. These sites do not form part of the Natura 2000 network of European sites and the Appropriate Assessment process does not apply to NHAs or pNHAs. Proposed Natural Heritage Areas (pNHAs) were published on a non-statutory basis and have no statutory protection. However, these sites are considered to be of significance for wildlife and habitats as they may form statutory designated sites in the future (NPWS, 2018).

1.3.5 The Flora (Protection) Order 2015 provides protection to a wide variety of protected plant species in Ireland including vascular plants, mosses, liverworts, lichens and stoneworts. Under the Flora Protection Order, it is illegal to cut, uproot or damage species listed in any way or to alter, damage or interfere in any way with their habitats.

National Policy

1.3.6 The National Biodiversity Action Plan 2017-2021 is a framework for the conservation and protection of biodiversity in Ireland. The main objective of the plan is to conserve and restore biodiversity and ecosystem services. Objective 1 of the National Biodiversity Action Plan identifies the following relevant measures in relation to future developments:

"Mainstreaming biodiversity into decision-making across all sectors".

"All Public Authorities and private sector bodies move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure".

1.3.7 Such policies have informed the evaluation of ecological features recorded within the study area and the ecological assessment process.

Local Policy

1.3.8 Clonburris Strategic Development Zone falls under South Dublin County Council and development for the zone was planned for in the South Dublin County Council Development Plans 2010-2016 and 2016-2022. The population at the time of the last census in 2016 was 278,767. Population growth is projected to continue to rise to 325,285 in 2028, as stated in the draft South Dublin County Council Development Plan 2022-2028. South Dublin County Council have published a Planning Scheme specifically for Clonburris SDZ (2019) which aims to deliver 9,416 homes for 23,000 people, with 8 schools, 22.520 m2 of retail floorspace, 12.5 km of cycle paths and walkways while maintaining 90 ha of parks and open space. In SDCC DP 2016-2022, Clonburris is classed as level 3 in the retail hierarchy which means it is a district centre which requires at least one large supermarket, a range of cafes and restaurants and leisure activities to cater for a population of 10,000-40,000 people. Because of the ecological value of the lands, a Biodiversity Management Plan was prepared by qualified ecologists (Scott Cawley Ltd) to form part of the Parks and Landscape Strategy of the Planning Scheme.

1.4 Review of relevant guidance and source of consultation

1.4.1 This report has been informed by the following key reports, policy and guidance notes:

- Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM 2018)
- Fossit (2000) A guide to habitats in Ireland. The Heritage Council (Fossitt 2000)
- Clonburris Planning Scheme (South Dublin County Council, 2019)
- Clonburris Strategic Development Zone Biodiversity Management Plan Clonburris, Co. Dublin. (Scott Cawley Ltd., 2021a)
- Ecological Survey of Clonburris Strategic Development Zone, Clondalkin, Co. Dublin (FERS Ltd., 2018)
- Outline Invasive Species Management Plan (Scott Cawley Ltd., 2020)

1.4.2 An email was also sent to the NPWS on 27/04/2022 with a request for any relevant information regarding the site or issues to be aware of around the proposed development. The site location and a brief description of the proposed development was included. No answer was received at the time of issue of the draft EcIA.

1.4.3 Data on water quality of relevant water bodies was accessed on the Environmental Protection Agency website (www.epa.ie) on 27/04/2022.

1.4.4 In summary, the species and habitats provided with national and international protection under these legislative and policy documents have been considered in this Ecological Impact Assessment.

2.0 METHODS

2.1 Setting the zone of influence

2.1.1 In accordance with the CIEEM (2019) guidelines, the locations of ecological receptors identified in the desk study which could be affected by the biophysical changes resulting from the development of the site have been used to set the zone of influence for the proposed development. The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change, thus for this assessment two different zones of influence for different features were identified.

2.1.2 For the majority of the site features, the zone of influence was set to include the areas within the red line boundary, and up to 1 km from this boundary, which includes a segment of the Grand Canal pNHA. Specific study areas were identified within this zone where more detailed desk study and field surveys were undertaken, to establish the ecological baseline, and to inform the evaluation of ecological resources and the selection of key ecological receptors.

2.1.3 A second zone of influence was identified to describe potential impacts on designated areas of international and national importance for nature conservation (i.e. Special Areas of Conservation (SACs), candidate SACs (cSACs), Special Protection Areas (SPAs), Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs)). This zone was delineated based on the geographic context of the Site using the Source-Pathway-Receptor model as recommended by the Office of the Planning Regulator (OPR, 2021) where qualifying features of the designated sites are the receptor, the proposed development is the source and a pathway exists that allows an impact or effect of the source on the receptor. Using the AA Screening Report in Appendix C as a reference, the second zone of influence for this project was determined to include Rye Valley Water SAC, Glenasmore Valley SAC, Wicklow Mountains SAC and SPA, Dublin Bay North SAC, Dublin Bay South SAC South Dublin Bay and River Tolka Estuary SPA, North Bull Island SPA, Howth Head SAC, Howth Head Coast SAC, Rockabill to Dalkey Island SPA and Ireland's Eye SAC. The potential zone of influence for this project therefore extends ca. 24 km. Nationally designated conservation sites within 10km of the proposed development were also considered (see Table 2 below).

2.2 Desk study

Site information

2.2.1 Aerial photography of the site was reviewed in conjunction with a selection of freely available open data GIS layers detailing local environmental characteristics, available at https://gig.epa.ie/EPAMaps/, in order to assess the relationship of the proposed Site to adjacent habitats.

2.2.2 Ecological surveys were previously carried out by Scott Cawley as part of an Environmental Assessment Impact Report (EAIR) for Clonburris Strategic Development Zone (SDZ). The survey reports were reviewed in relation to the subsection in question and relevant results were incorporated into this EcIA. Other relevant ecological reports,

such as the Waterways Ireland reports (2016, 2018) of their ecological assessment of the Grand Canal Main Line were also referenced.

Designated site information

2.2.3 The EPA map viewer was also used to access NPWS data on designated sites within the project's zone of influence. Designated sites that may be affected by the proposed works were identified using the Source-Pathway-Receptor framework, as outline in OPR 2021. A search was carried out for Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHA) within the zone of influence and any areas of native woodland in close proximity to the Site.

Biological records

2.2.4 A data search was carried out to ascertain whether designated conservation sites were present within a potential zone of influence of the proposed Development. Records of any species with conservation status found on or within 1 km of the Site were also retrieved from the National Biodiversity Data Centre records at www.biodiversityireland.ie. The National Biodiversity Centre records comprise a combination of 161 different datasets provided by various public and private organisations across Ireland. The Inland Fisheries Ireland Water Framework Directive map was also consulted to determine the water quality status and species richness of waterways within the site's zone of influence.

2.3 Field survey

Habitat survey

2.3.1 The Site was visited by Dr Florentine Spaans on 13th April 2022. All habitats and key plant species were recorded. Habitats were classified based on Fossitt 2000 (Figure 2). Relevant photographs are appended (Appendix A) and a plant species list is included in Appendix B.

Invasive non-native plant species (INNS)

2.3.2 Any invasive non-native plant species were noted during the site walk-over, with particular attention given to any species mentioned in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (2011).

Protected species surveys

2.3.3 Surveys were carried out for key faunal species and species groups and the potential for the site and adjacent areas to support protected faunal species was considered. Any relevant field signs were noted and further surveys were recommended as required.

Amphibians

Frog

2.3.4 Any pools of water that have potential to host common frog were noted. Because of the timing of the initial site visits in May, a search was also done for tadpoles in any such

pools on the 26th May 2022. These surveys were conducted using amphibian surveying methodology by Arntzen, 2002. Ponds were dip-netted at night, dragging the net through the standing water in a figure of 8, with the contents then being identified once removed from the water.

Smooth newt

2.3.5 The Smooth newt (*Lissotriton vulgaris*) is the only species of newt found in Ireland. The suitability of habitat for the smooth newt within the boundary of the application site was assessed during the walkover survey and the location and features of any areas of standing/slow flowing water were target noted.

2.3.6 The potential for newts to be present is assessed using the Habitat Suitability Index (HSI) methodology developed by Oldham et al., (2000) based on geographic, physical and biotic parameters. The methodology, designed to evaluate habitat suitability for Great crested newt *Triturus cristatus* in Great Britain, provides a useful indicator for smooth newt suitability in Ireland. The HSI for this site was calculated following the methodology presented in ARG UK Great Crested Newt Habitat Suitability Index (2010) document.

2.3.7 NPWS's Specific Requirements in relation to Newt Surveys and 'Great Crested Newt Mitigation Guidelines' (English Nature, 2001) were considered while carrying out the field surveys. Although the latter were designed with specific focus on Great crested newts, certain aspects of the survey methodology and mitigation they present are considered equally applicable to smooth newts.

2.3.8 Torchlight survey methodology was also employed during site visit 26 May 2022 by Éinne Ó Cathasaigh to ascertain smooth new presence/absence and population size class. Ponds were surveyed using a dip-net, which was dragged through the standing water in a figure of 8, and the collected contents was identified (Arntzen, 2002). Suitability categories follow the Amphibian and Reptile Groups of Great Britain notation (ARG 2010).

2.3.9 Each survey was conducted, during suitable weather conditions (no rain, temperature >5°C and little or no wind). All surveys began at least 30 minutes post sunset and lasted one hour.

Birds

2.3.10 Any features on site which were assessed as having the potential to support breeding birds, e.g. hedgerows, scattered trees, woodland and cavities within buildings, as well as any birds displaying breeding behaviour such as singing or nest building, were recorded during the initial site walkover. Bird species encountered during the survey were also noted.

Breeding birds

2.3.11 Three breeding bird surveys were conducted during the summer of 2022. The site was covered with a slow paced transect, the direction of which was randomly decided and adapted to the sites features. During the transects, each bird species, the number of individuals of each species, and an estimated distance from the transect line was recorded, along with observed behaviours and/or flight directions, laid out in Gilbert et al., 1998.

Bats

2.3.12 An assessment of both the quality of the foraging habitat and the Bat Roosting Potential (BRP) of trees on site was conducted during the field survey following the Bat Conservation Trust (BCT)'s 'Bat Surveys for Professional Ecologists: Good Practice Guidelines' (2016). This entailed a preliminary ground level roost assessment with the aim of identifying any features that bats could use for roosting (Potential Roosting Features or PRFs). Active bat surveys to assess habitat use by bats and emergence and re-entry surveys on Cappagh House were conducted to determine PRF use by bats. Active surveys involved the walking of a series of transects at a steady pace around the margains of the site and along the treelines. The identification of Potential Bat Features allowed surveys to determine whether these potential roosts were in use by bats.

2.3.13 The potential presence of roosting bats was also assessed by searching for:

- bat droppings;
- odour; and
- staining.

2.3.14 The BRP of each PRF was assessed as negligible, low, moderate or high based on criteria listed in the BCT's 'Bat Surveys for Professional Ecologists: Good Practice Guidelines' (2016).

Other mammals

Badger

2.3.15 The search area comprised all land within the site boundary and 25m beyond this where possible.

2.3.16 The search area was thoroughly surveyed for evidence of badgers in the form of:

- Faeces: badgers usually deposit faeces in characteristic excavated pits, concentrations of which (latrine sites) are typically found at home range boundaries;
- Setts, comprising either single isolated holes or a series of holes, likely to be interconnected underground;
- Paths between setts or leading to feeding areas;
- Scratching posts at the base of tree trunks;
- Snuffle holes (small scrapes where badgers have searched for insects, earthworms and plant tubers);
- Day nests (bundles of grass and other vegetation where badgers may sleep above ground);
- Hair traces; and
- Footprints

Otter

2.3.17 The search area comprised all land within the site boundary and 30 m beyond this along either side of any waterways where possible.

2.3.18 The search area was thoroughly surveyed for evidence of otter in the form of:

- Faeces: Otters usually deposit faeces in prominent areas such as an area of raised ground, stone or log;
- Holts, comprising either single burrows or a series of burrows
- Paths leading to and from water bodies;
- Paths leading to and from holts;
- Day nests (bundles of grass and/or areas of flattened vegetation where otters may rest above ground);
- Hair traces;
- Prey remains e.g. fish; and
- Footprints

2.4 Assessment

Determination of key ecological receptors

2.4.1 The evaluation of ecological resources is necessary in order to determine the presence of 'Key Ecological Receptors', which are sufficiently valuable for a significant effect upon them to be material in decision-making.

2.4.2 It is not necessary to "carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable", although this does not mean that efforts should not be made to safeguard wider biodiversity, and national policy documents emphasize the need to achieve no net loss of biodiversity and enhancement of biodiversity (CIEEM, 2019).

2.4.3 Ecological features can be of value for a variety of reasons and the rationale used should demonstrate a robust selection process. Various characteristics contribute to the importance of ecological features, including:

- naturalness
- rare or uncommon species or habitats in the local, national or international context
- endemic species or locally distinct sub-populations of a species
- ecosystems and their component parts, which provide the habitats required by important species, populations and/or assemblages
- habitat diversity
- size of habitat or species population
- habitat connectivity and/or synergistic associations
- habitats and species in decline

- rich assemblages of plants and animals
- large populations of species or concentrations of species considered uncommon or threatened in a wider context
- plant communities (and their associated animals) that are considered to be typical of valued natural/semi-natural vegetation types, including examples of naturally species poor communities
- species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

2.4.4 The value of ecological features within the Zone of Influence has been determined within their geographical frame of reference as being of international (European), national, regional, county, borough or local importance. The ecological receptors classified as of importance at the borough level and above are considered to be sufficiently valuable for a significant effect upon them to be material in decision making. All features on site have been assessed for their importance, and only those features assessed as ecologically important will be discussed in further detail.

Assessing potential effects and identifying mitigation and enhancement measures

2.4.5 The potential impacts and effects of the proposed development have been determined from the likely key activities and associated biophysical changes that may arise during construction, operation and decommissioning. The assessment of impacts has been undertaken in relation to the baseline conditions, with reference to aspects of ecological structure and function on which each receptor depends. Impacts can include direct loss of habitats, fragmentation and isolation of habitats, disturbance to species, changes to key habitat features and changes to the local hydrology and/or water quality. Impacts have been characterised in consideration of the following parameters:

- Positive or negative;
- Extent (area over which the impact occurs);
- Magnitude (size or amount of an impact);
- Duration (time over which the impact is expected to last prior to recovery or
- replacement);
- Timing and frequency (particularly in relation to critical life-stages or seasons); and
- Reversibility (whether an impact is permanent i.e. no recovery is possible, or temporary i.e. where spontaneous recovery is possible or where mitigation is possible and enforceable).

Assessing the significance of effects

2.4.6 Potential impacts on relevant ecological features are assessed and a judgement reached on whether or not the resultant effect on conservation status or structure and function is likely to be significant. This process takes into consideration the characteristics of the impact, the sensitivity of the ecological receptor concerned, and the geographic scale at which the feature is considered important.

2.4.7 EU Commission guidance (EU, 2017) states that: "The concept of significance considers whether or not a Project's impact could be determined to be unacceptable in its environmental and social contexts." and goes on to say that the magnitude of the predicted effect and the sensitivity of the receiving environment are common criteria used to evaluate significance:

- Magnitude considers the characteristics of the change (timing, scale, size, and duration of the impact) which would probably affect the target receptor as a result of the proposed Project;
- Sensitivity is understood as the sensitivity of the environmental receptor to change, including its capacity to accommodate the changes the Projects may bring about.

2.4.8 For designated/defined sites and ecosystems, the assessment considers what effect the potential impacts are likely to have on conservation objectives or interest/qualifying features. For ecosystems, consideration is given to whether a change in ecosystem structure and/or function is likely that would substantively alter its ecological integrity.

2.4.9 For habitats and species, the assessment considers what effect the potential impacts will have on "conservation status", and whether or not the effect is likely to substantively alter the ecological integrity of the habitat or species under consideration. Further guidance on how to assess conservation status is provided in the CIEEM Guidelines (2019) as follows:

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

2.4.10 In considering effects on conservation status, reference is made to relevant available guidance on the current conservation status of the ecological feature under consideration. Effects can be both positive or negative (effects in this report are negative unless otherwise stated) and will either be:

- Negligible (i.e. no ecologically meaningful effect on conservation status)
- Minor significance (i.e. an ecologically meaningful effect on conservation status of representing a minor change)
- Moderate significance (i.e. an ecologically meaningful effect on conservation status representing a moderate change)
- Major significance (i.e. an ecologically meaningful effect on conservation status representing a major change)

2.4.11 The following table from the EU Commission guidance on EIA scoping (EU, 2017 (1)) was used to assign a significance level of various impacts on key ecological receptors:

Table 1. Table showing level of significance of impacts on ecological receptors.

Impact magnitude	Environmental sensitivity		
	High	Medium	Low
Major	High	High	Moderate
Moderate	High	Moderate	Minor
Minor	Moderate	Minor	Negligible

3.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Site location

3.1.1 The proposed development forms a small part of the planned development for the Clonburris Strategic Development Zone, as set out in the Clonburris SDZ Planning Scheme (South Dublin County Council, 2019). The Site measures ca. 6.3 ha and is located at the eastern end of the SDZ, west of the Ninth Lock Road and east of Clondalkin and Fonthill train station (Figure 2; Irish Grid: O 06442 32486). The railway line runs immediately north of the Site and the Grand Canal is located ca. 90 m from the southern Site boundary.

3.2 Proposed housing development

3.2.1 Kelland Homes Ltd seeks permission for development on the site. The proposed development consists of the construction of 283 no. dwellings, crèche and 3 no. retail / commercial unit, comprised of:

- 112 no. 2, 3 & 4 bed, 2 storey semi-detached and terraced houses;
- 110 no. 2 & 3 bed duplex units accommodated in 10 no. 3 storey buildings;
- 61 no. 1 & 2 bedroom apartments in 2 no. 4 & 6 storey buildings;
- 2 storey creche (c.599m²);
- 2 no. retail /commercial unit (c.152m²).
- 1 no. retail /commercial unit (c. 325m²)

3.2.2 Access to the development will by via the permitted road network (under Ref. SDZ20A/0021) which provides access from the Ninth Lock Road to the east and the R113 (Fonthill Road) to the west. The proposed development will connect into the permitted infrastructural works as approved under the Clonburris Strategic Development Zone Planning Scheme (2019) and permitted under Ref. SDZ20A/0021, with the proposed development connecting into the permitted surface water drainage attenuation systems i.e. 1 no. pond, 3 no. modular underground storage systems and 1 no. detention basin combined with modular underground storage systems. The proposed wastewater infrastructure will connect into a permitted foul pumping station and pipe network within proposed road corridors to facilitate drainage connections to future wastewater drainage infrastructure within the adjoining SDZ lands (including future Irish Water pumping station granted under SDZ21A/0006).

3.2.3 The proposed development also provides for all associated site development works above and below ground, public & communal open spaces, hard & soft landscaping and boundary treatments, surface car parking, bicycle parking, bin & bicycle storage, public lighting, plant (M&E), utility services & ESB sub-stations.

3.2.4 This application is being made in accordance with the Clonburris Strategic Development Zone Planning Scheme 2019 and relates to a proposed development within the

Clonburris Strategic Development Planning Scheme Area, as defined by Statutory Instrument No. 604 of 2015.

3.3 Surface water

3.3.1 According to Chapters 8 and 11 of the EAIR produced for the infrastructure to be put in place across Clonburris SDZ and which has been granted planning permission, the surface water on Site drains to the south-east to existing stormwater networks on Ninth Lock Road. The drainage run continues south on Ninth Lock Road where it splits into parallel runs along Station Road which later merge and discharge to an open watercourse within the industrial estate. The watercourse discharges into the Camac River which joins the River Liffey ca. 8.1 km downstream before entering Dublin Bay another ~7.6 km further downstream.

3.3.2 An overflow channel runs beside the Grand Canal to the south of the Site. Surface water from the Site does not however appear to drain into this channel, though some mixing may occur during flood events.

3.4 Foul water

3.4.1 The foul water drainage network which is to service the Site is to pass through a pumping station that is to be built along the R112 Fonthill Road and from there to connect through a rising main to the existing 9B sewer trunk connection. Foul water will be treated at Ringsend WwTP, which ultimately discharges into Dublin Bay.

4.0 BASELINE ECOLOGICAL CONDITIONS

4.1.1 Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding, with the ecological baseline conditions being "those existing in the absence of proposed activities" (CIEEM, 2019). However, the EIA Directive also requires "an outline of what is likely to happen to the environment should the Project not be implemented – the so-called 'do-nothing' scenario" (EU, 2017).

4.1.2 The following sections outline the baseline ecological conditions of the proposed development site and chapter 5 outlines how the site might be expected to develop if the project were not to proceed.

4.2 Designated sites

4.2.1 There are no designated areas in the Site itself nor in the immediate area around the Site. However, the Site is part of a watershed area that feeds into several Natura 2000 sites.

4.2.2 Using the GIS software, QGIS (Version 3.22), designated sites within the zone of influence of the proposed development were identified. Sites up to 24 km away were considered but if no potential for significant effects was identified on such sites using the Source-Pathway-Receptor model those sites were subsequently excluded. Figure 1 shows a map of relevant designated sites in relation to the Site of proposed development. Details of sites for which a pathway of effect could not immediately be excluded are listed in Table 2 below.

Table 2. Designated sites within the zone of influence of the site of proposed development on which there is a possibility of likely significant effects.

Designated name and code	Qualifying Interests	Distance from proposed development (approximate)	Connections
The Grand Canal pNHA (SY002104)	• *Opposite-leaved pondweed (Groenlandica densa)* • *Otter* • *Smooth newt* Various habitats (hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub, woodland) providing refuge for a diversity of species	90 m S	**No** The site is within the zone of influence of the birds and mammals that are associated with the pNHA. The hydrological connection with the Grand Canal is not considered likely in the context of the attenuation proposed on site and intervening attenuation and habitat associated with the development adjacent the site to the south and therefore no likely significant effect
Liffey Valley pNHA (SY000128)	• *Atlantic salmon* • *Diversity of terrestrial and aquatic habitats including mixed deciduous woodland and marsh* • *Green figwort (Scrophularia umbrosa)* • *Hairy St. John's wort (Hypericum hirsutum)* Yellow archangel (Lamiastrum galeobdolon)	2.8 km N	**No** The site is in the same watershed area but is not hydrologically connected to the pNHA
Royal Canal pNHA (SY002103)	• *Opposite-leaved pondweed (Groenlandica densa)* • *Otter* • *Smooth newt* Various habitats (hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub, woodland) providing refuge for a diversity of species	5.0 km N	**No** The site is in a different watershed area and any emissions will be sufficiently diluted by distance to have no likely significant effect
Dodder Valley pNHA (SY000991)	• *Last remaining natural river bank vegetation in the greater Dublin area* • *Woodland scrub and wildflower meadows* Diversity of bird species	6.4 km SE	**No** The site is in the same watershed area but is not hydrologically connected to the pNHA. The site is at sufficient distance that birds at the pNHA are unlikely to utilise its ecological features

Designated name and code	Qualifying Interests	Distance from proposed development (approximate)	Connections
Rye Water Valley SAC (IE001398) and pNHA	• *Petrifying springs with tufa formation (Cratoneurion) [7220]* • *Vertigo angustior (Narrow-mouthed Whorl Snail) [1014]* Vertigo moulinsiana (Desmoulin's Whorl Snail) [1016]	6.5 km NW	**No** The site is in a different watershed area and any emissions will be sufficiently diluted by distance to have no likely significant effect
Lugmore Glen pNHA (SY001212)	• *Semi-natural woodland* *Yellow archangel (Lamiastrum galeobdolon)*	6.7 km S	**No** The site lies downstream from the pNHA and any emissions will be diluted sufficiently by distance to have no likely significant effect
Slade of Saggart and Crooksling Glen pNHA (SY000211)	• *Wooded river valley* • *Lakes* • *Yellow archangel (Lamiastrum galeobdolon)* • *Rare invertebrate Halticoptera patellana (Hymenoptera)* Variety of wildfowl	7.9 km SSW	**No** The site lies downstream from the pNHA and any emissions will be diluted sufficiently by distance to have no likely significant effect
Glenasmole Valley SAC (IE001209) and pNHA	• *Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]* • *Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]* Petrifying springs with tufa formation (Cratoneurion) [7220]	8.3 km SSE	**No** There is no hydrological connection and any emissions will be diluted sufficiently by distance to have no likely significant effect
Wicklow Mountains SAC (IE002122)	• *Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoto-Nanojuncetea [3130]* • *Natural dystrophic lakes and ponds [3160]* • *Northern Atlantic wet heaths with Erica tetralix [4010]* • *European dry heaths [4030] Alpine and Boreal heaths [4060]* • *Species-rich Nardus grasslands, on siliceous*	10.5 km S	**Yes** Increases in residential housing in may put increased recreational pressure on the SAC, particularly in conjunction with other development in the wider Dublin area.

Designated name and code	Qualifying Interests	Distance from proposed development (approximate)	Connections
	substrates in mountain areas (and submountain areas, in Continental Europe) [6230]* • *Blanket bog (*active only) [7130]* • *Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) [8110]* • *Calcareous rocky slopes with chasmophytic vegetation [8210]* • *Siliceous rocky slopes with chasmophytic vegetation [8220]* • *Old sessile oak woods with Ilex and Blechnum in British Isles [91A0]* Otter (Lutra lutra) [1355]		
Dublin Bay North pNHA (SY000206)	Saltmarsh and mudflats	11.5 WNW	**Yes** There is a weak hydrological connection to the Site and the development may put more pressure on the Ringsend WwTP which discharges into the area
Wicklow Mountains SPA (IE004040)	• *Merlin (Falco columbarius) [A098]* Peregrine (Falco peregrinus) [A103]	12.3 km SE	**Yes** The birds that form qualifying features of the SPA may utilise the site but they are unlikely to be reliant on its ecological features
Dublin Bay South SAC (IE000210) and pNHA	• *Mudflats and sandflats not covered by seawater at low tide [1140]* • *Annual vegetation of drift lines [1210]* • *Salicornia and other annuals colonising mud and sand [1310]* Embryonic shifting dunes [2110]	12.4 km W	**Yes** There is a weak hydrological connection to the Site and the development may put more pressure on the Ringsend WwTP which discharges into the area
South Dublin Bay and River Tolka Estuary SPA (IE004024)	• *Light-bellied Brent Goose (Branta bernicla hrota) [A046]* • *Oystercatcher (Haematopus ostralegus) [A130]* • *Ringed Plover (Charadrius hiaticula) [A137]*	12.4 km W	**Yes** There is a weak hydrological connection to the Site and the development may put more pressure on the Ringsend WwTP which

Designated name and code	Qualifying Interests	Distance from proposed development (approximate)	Connections
	• *Grey Plover (Pluvialis squatarola) [A141]* • *Knot (Calidris canutus) [A143]* • *Sanderling (Calidris alba) [A144]* • *Dunlin (Calidris alpina) [A149]* • *Bar-tailed Godwit (Limosa lapponica) [A157]* • *Redshank (Tringa totanus) [A162]* • *Black-headed Gull (Chroicocephalus ridibundus) [A179]* • *Roseate Tern (Sterna dougallii) [A192]* • *Common Tern (Sterna hirundo) [A193]* • *Arctic Tern (Sterna paradisaea) [A194]* Wetland and Waterbirds [A999]		discharges into the area. Some birds that form qualifying features of the SPA may utilise the site.
Dublin Bay North SAC (IE000206)	• *Mudflats and sandflats not covered by seawater at low tide [1140]* • *Annual vegetation of drift lines [1210]* • *Salicornia and other annuals colonising mud and sand [1310]* • *Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]* • *Mediterranean salt meadows (Juncetalia maritimi) [1410]* • *Embryonic shifting dunes [2110]* • *Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120]* • *Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]* • *Humid dune slacks [2190]* • *Petalophyllum ralfsii (Petalwort) [1395]*	15.0 WNW	**Yes** There is a weak hydrological connection to the Site

Designated name and code	Qualifying Interests	Distance from proposed development (approximate)	Connections
North Bull Island SPA (IE004006)	• *Light-bellied Brent Goose (Branta bernicla hrota) [A046]* • *Shelduck (Tadorna tadorna) [A048]* • *Teal (Anas crecca) [A052]* • *Pintail (Anas acuta) [A054]* • *Shoveler (Anas clypeata) [A056]* • *Oystercatcher (Haematopus ostralegus) [A130]* • *Golden Plover (Pluvialis apricaria) [A140]* • *Grey Plover (Pluvialis squatarola) [A141]* • *Knot (Calidris canutus) [A143]* • *Sanderling (Calidris alba) [A144]* • *Dunlin (Calidris alpina) [A149]* • *Black-tailed Godwit (Limosa limosa) [A156]* • *Bar-tailed Godwit (Limosa lapponica) [A157]* • *Curlew (Numenius arquata) [A160]* • *Redshank (Tringa totanus) [A162]* • *Turnstone (Arenaria interpres) [A169]* • *Black-headed Gull (Chroicocephalus ridibundus) [A179]* Wetland and Waterbirds [A999]	15.0 WNW	**Yes** There is a weak hydrological connection to the Site. Some birds that form qualifying features of the SPA may utilise the site.
Dalkey Coastal Zone and Killiney Hill pNHA (SY002106)	• *Variety of coastal habitats ranging from sub-littoral to coastal heath* • *Well-developed local flora* • *Important site for nesting and roosting birds such as herring gull, greater and lesser black-backed gull, shelduck, shag, cormorants, curlew and various tern species.* • *Coastal invertebrates including squat lobster, swimming crab, crawfish and spiny starfish* Geological features	18.6 km WSW	**Yes** There is a very weak hydrological connection to the Site and the development may put more pressure on the Ringsend WwTP which discharges into Dublin Bay. Some birds that form qualifying features of the SPA may utilise the site.

Designated name and code	Qualifying Interests	Distance from proposed development (approximate)	Connections
Rockabill to Dalkey Island SAC (IE003000)	• *Reefs [1170]* Phocoena phocoena (Harbour Porpoise) [1351]	20.6 km SW	**Yes** There is a very weak hydrological connection to the Site
Howth Head Coast SAC (IE000202) and pNHA	• *Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]* European dry heaths [4030]	20.7 km WNW	**Yes** There is a very weak hydrological connection to the Site
Ireland's Eye SPA (IE004117)	• *Cormorant (Phalacrocorax carbo) [A017]* • *Herring Gull (Larus argentatus) [A184]* • *Kittiwake (Rissa tridactyla) [A188]* • *Guillemot (Uria aalge) [A199]* Razorbill (Alca torda) [A200]	23.3 km NW	**Yes** There is a very weak hydrological connection to the Site and some birds that form qualifying features of the SPA may utilise the site.
Ireland's Eye SAC (IE002193) and pNHA (SY000203)	• *Perennial vegetation of stony banks [1220]* Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	23.6 km NW	**Yes** There is a very weak hydrological connection to the Site

4.3 Habitats

4.3.1 The habitat map presented in the Clonburris SDZ Biodiversity Plan (Scott Cawley, 2021b) was updated during the initial Site visits in April 2022. Habitats were identified in accordance with the Heritage Council's 'Guide to Habitats in Ireland' (Fossitt, 2000). The map is included as Figure 2 below.

4.3.2 The Site covers ca. 6.3 ha and currently consists mainly of dry meadow (GS2) and hedgerow (WL1), spoil and bare ground (ED2), and recently felled woodland (WS5), Drainage ditches (FW4), some of the vegetation has been recently removed or cut back , leaving the area covered with small branches and wood chip (ED2). A large ruined stone building (BL1), heavily overgrown with ivy and other vegetation, is present in the south-eastern end of the Site and the area of woodland that previously existed around the building has been recently cleared (WS5). There is an area of recolonising bare ground in the north-eastern corner (ED3) with an earth bank (BL2) covered in dry meadow beside it, likely composed of soil and debris scraped from the area of recolonizing bare ground. Metal fencing separates the Site from a sealed walkway and the railway tracks to the north and from a strip of scrub leading up to Ninth Lock Road to the east of the Site.

4.3.3 The Grand Canal lies ca. 90 m south of the site and Clondalkin Fonthill Railway station immediately to the north-west. The local bedrock is limestone of the Lucan formation, overlain with poorly drained mineral soils derived from limestone.

4.3.4 Table 3 below summarizes the habitat types present on the site and the area each covers.

Table 3. Broad habitat types identified at the site of proposed development at Clonburris SDZ, Co. Dublin.

Fossitt code	Habitat type	Description	Approx. area/length	Key Ecological Receptor
BL1	Stone walls	Ruin of an old manor with chimneys but no roof *(Note* this ruin is not part of our application / to be demolished under SDZ20/021)*	250 m	No
BL2	Earth bank	Heaped piles of soil overgrown with grasses, likely scraped from area of recolonising bare ground in NW of site.	0.39 ha	No
BL3	Buildings and artificial surfaces	A small sealed-over area forms a site access from the Ninth Lock Road.	0.04 ha	
ED2	Spoil and bare ground	There are areas of bare soil and scattered brash where scrub has been	0.41 ha	No

Fossitt code	Habitat type	Description	Approx. area/length	Key Ecological Receptor
		recently cleared from around hedgerows and in the dry meadow.		
ED3	Recolonising bare ground	An area of coarse gravel has been largely covered with mosses, clumps of hard rush and herbs	0.91 ha	No
FW4	Drainage ditches	Drains partially filled with water follow some of the hedges.	280 m	Yes
GS2	Dry meadows and grassy verges	Three fields of dry meadow take up the majority of the area on the site.	5.3 ha	Yes
WL1	Hedgerows	Five hedgerows cross the site in both N-S and E-W directions. One of them has been completely cut so that only tree stumps remain (H5) while another (H3) has been partially removed and H1 has been severely cut back.	Total length 575 m	Yes
WS5	Recently felled woodland	The ruined building used to be surrounded by a small area of woodland that has been recently cut. Woodchips, tree stumps and some cut logs remain and patches of daffodils and bluebells are visible.	0.59 ha	No

4.3.5 There are no Habitats Directive Annex I priority features on the Site.

4.3.6 Hedgerows can however be classified as ecological receptors of local, regional and sometimes national importance. These habitat types are known to provide a wide range of ecosystem services at the local to regional scale and under the EIA Regulation (2011) an application for a screening decision must be submitted if the planned length of hedgerow to be removed exceeds 500 m. Hedgerows play a major part in connectivity within the landscape.

4.3.7 Hedgerows and scrub are also of importance to species such as birds and bats, which are protected under national legislation. It is prohibited under Section 40 of the Wildlife Act 1976 to cut hedges and scrub during the bird breeding season between 1st March and 31st August every year.

4.4 Species

Plants

4.4.1 A list of plant species present on the site was compiled at the time of the habitat survey in April 2022 and has been included in Appendix B. No protected or endangered plant species were identified on the Site but species of interest on the site are scattered cowslip, primrose and bluebell.

Invasive non-native species

4.4.2 Several non-regulated non-native invasive plants of medium to high impact were found on the Site. These are butterfly bush, snowberry, pirri-pirri burr and cherry laurel. A map showing the locations of the INNS is included as Figure 3. Previously to this report, Japanese knotweed was identified by an earlier walkover assessment. The knotweed was treated but not removed in 2021 and 2022, and will be removed by others under SDZ20A/002. Further information about the mitigation, management and removal of invasive plant species in site can be found within the Biodiversity Management Plan (RSK BMP, 2022).

Invertebrates

4.4.3 Invertebrate surveys carried out by FERS Ltd in 2018 included surveys for butterflies, bees and bumblebees and surveys for aquatic invertebrates in the CSDZ and the Grand Canal found that the diversity in the streams was found to be very low and diversity and numbers of invertebrates were found to have decreased since surveys carried out in 2015. The canal was found to have the highest diversity of invertebrate species-particularly where undisturbed.

Fish

4.4.4 The Camac River, which approaches the proposed development site at around 1.2km to the south east is the baseline for drainage within the site, and is therefore a potential conduit for pollutants that may be generated on the site. The river is here approximately 5m wide on average, lined generally with amenity grassland and scattered trees.with opaque water. Brown trout (*Salmo trutta*), lamprey (*Lampetra* sp), three-spined stickleback (*Gasterosteus aculeatus*) and minnow (*Cyprinidae*) are present in the river (Inland Fisheries Ireland, 2017), and Atlantic salmon (*Salmo salar*) and European eel (*Anguilla anguilla*) have been recorded (AECOM 2021).T

4.4.5 According to Waterways Ireland (2016 and 2019), the Grand Canal, located around 90m to the south of the proposed development, offers suitable habitat for a range of coarse fish including roach (*Rutilus rutilus*), perch (*Perca fluviatilis*), pike (*Esox lucius*), bream (*Abramis brama*); rudd (*Scardinius erythrophthalmus*), carp (*Cyprinus carpio*), three-spined stickleback, nine-spined stickleback (*Pungitius pungitius*) and tench (*Tinca tinca*). Roach are the dominant species within the Grand Canal in terms of biomass and abundance. European eel also occurs within the Grand Canal system and there are limited records for river lamprey (*Lampetra fluviatilis*). Due to the modified nature of the canal, no suitable spawning habitat for salmonids in the form of well sorted gravels exist and the numerous lock gates along the canal act as obstacles to migrating fish such as salmonids and lamprey species.

Amphibians

Common frog

4.4.6 While no frogs, tadpoles or frogspawn were identified on the Site during the site visit in April, there are multiple recent records for common frog *Rana temporaria* within 500 m of the Site and their presence is likely.

Smooth newt

4.4.7 Four ditches and pools of standing water were identified on site. Most contained very shallow water and were clearly polluted. Newt suitability indices were calculated for each area as shown below. All ditches with standing water were littered with brash from cut branches and dumped rubbish. The only record for newt within 500 m of the Site dates from 1973. Results are summarised in Table 5.

Table 4. Water body habitat suitability for newts

Location ID	Location	HSI Score	Suitability
N1	Standing water in ditch alongside H1	0.24	Poor
N2	Standing water in ditch alongside H2	0.51	Below average
N3	Standing water in ditch near Whiton Avenue	0.45	Poor
N4	Standing water in ditch at the southwest of the Site:	0.49	Poor

4.4.8 No newts, efts or newt eggs were found. The ponds on site were heavily degraded, mostly ephemeral, and no exposed to sufficient sunlight to be described as suitable breeding conditions. This is corroborated by the results of the HSI survey results, illustrated above.

4.4.9 Ponds were heavily degraded, and no newts were observed in the ditches identified in the torchlight survey. Therefore, no further surveys were considered necessary.

Birds

4.4.10 Twelve bird species (Table 4) were recorded during the initial site walkover and there were indications than many of the hedgerows and trees on the Site are likely used by breeding birds. Several species also likely nest in the old, ruined building on Site, including swallow (*Hirundo rustica*), which is on the BOCCI amber list, and possibly barn owl (*Tyto alba*; 4.4.13-4.4.14 below). Birds that nest outside the site boundary are also likely to use the site for foraging. There are records for 102 bird species on and within 500 m of the Site, including 50 species of conservation concern (NBDC; last accessed April 2022), and including grey partridge *Perdix perdix*, a species that has undergone a dramatic decline in abundance and range over the past fifty years (Balmer et al 2013).

Table 5. Bird species recorded during initial site visit.

Common name	Scientific name	Description	BOCCI listing
Blackbird	*Turdus merula*	X 2 in hazel near train station car park; x1 in sycamore in H1; x2 in H3	Green
Blue tit	*Cyanistes caeruleus*	X1 perched in ash in H2	Green
Common buzzard	*Buteo buteo*	X 3 circling just N of railway line, chased by hooded crow	Green
Dunnock	*Prunella modularis*	X 1 perched in E end of H3	Green
Great tit	*Parus major*	X 1 perched in H2	Green
Hooded crow	*Corvus corone*	X 2 perched beside railway line	Green
Magpie	*Pica pica*	X 4, flying E across F1	Green
Robin	*Erithacus rubecula*	X 2 singing in ivy on ruined building; x1 in H3	Green
Rook	*Corvus frugileus*	X 3, flying E across F1	Green
Song thrush	*Turdus philomelos*	X1 perched on ruined building	Green
Wood pigeon	*Columba palumbus*	X 1 flying W across F1 into hazel scrub; x2 in H1	Green
Wren	*Troglodytes troglodytes*	X1 in ivy on ruined building	Green

Wintering birds

4.4.11 Wintering bird surveys carried out by Scott Cawley (Scott Cawley, 2021) during the winter of 2020/2021 recorded four sightings of black-headed gull (*Chroicocephalus ridibundus*) and eight sightings of herring gull (*Larus argentatus*) within the site of proposed development. These species also extensively utilize the remainder of the SDZ. Grey partridge (*Perdix perdix*) (a red-listed species) and fieldfare (*Turdus pilaris*) were also reported within 80 m of the Site and three sightings of house sparrow (*Passer domesticus*) and one of buzzard were reported on the Site itself. Common gull (*Larus canus*), lapwing (*Vanellus vanellus*), lesser black-headed gull (*Larus fuscus*) were found to utilize the SDZ as well but were mainly recorded in the western sections and not on

the Site itself. Little grebe (*Tachybaptus ruficollis*), mallard (*Anas platyrhynchos*), moorhen (*Gallinula chloropus*) and mute swan (*Cygnus olor*) were also recorded mainly along the canal.

Breeding Birds

4.4.12 Breeding Bird Surveys carried out by Blackstaff Ecology (Blackstaff Ecology, 2022) during the summer of 2022 recorded a total of 29 bird species. Over the 3 surveys it was estimated that 14 bird species regularly breed on site, four of these being listed as species of medium conservation concern within the BoCCI (Birds of Conservation Concern in Ireland) list 2020-2026. These are Barn swallow (*Hirundo rustica*), starling (*Sturnus vulgaris*), lesser black-backed gull (*Larus fuscus*) and herring gull (*Larus argentatus*).

Barn owl

4.4.13 There are NBDC records for barn owl in the area and previous surveys for barn owl done in Clonburris SDZ indicate barn owl presence. A pair was known to nest in nearby Grange Castle but an internal inspection done in June 2021 did not reveal any use by barn owls (Scott Cawley, 2021c). The castle was renovated in 2020 which may have displaced the barn owls.

4.4.14 The chimneys of the ruined building present on the site of proposed development represent potential roosts for barn owl and surveys were recommended after the initial site walkover on a precautionary basis. This potential roosting site was not included in the 2021 Scott Cawley survey and the vantage points used during that survey are unlikely to have picked up barn owl activity at the Site of proposed development. The recent disturbance of clearing surrounding woodland may have had an adverse effect on their presence.

Bats

4.4.15 A number of features were assessed to have moderate suitability for bats, with both linear features and open habitat and connection to the Grand Canal via a narrow strip of grassland and scrub to the south. There are potential roosting features (PRF) on the Site in the form of large trees and chimneys and cracks in the stonework of Cappagh House. Further bat surveys were recommended after the preliminary ground level roost assessment survey. Locations of the features with bat roost potential can be found in Figure 4.

4.4.16 Subsequent endoscoping surveys of tree identified as having potential roosting features was carried out 28th June 2022. The work was conducted with Michael McGeough and ecologist Maeve McKenna who operated the camera from the ground. There were 7 trees marked as moderate during the initial walkover. Of these, 3 were climbed and the other 4 were not climbed as they were either checked from ground level or were deemed to not have suitable features. Of the 7 trees, only two were endoscoped, one from ground level and one from climbing. The other 5 features were deemed to not have suitable features to endoscope once assessed from the ground or after being climbed.

4.4.17 Transect surveys and emergence and re-entry surveys have been conducted on site, the full results of which are included within the associated bat report. Emergence and re-entry surveys showed that at least 3 PRFs on the walls of Cappagh House are likely in

use by bats. The active bat transects displayed that habitats on site are in use by small numbers of bats, foraging on site and using tree lines on site to travel to other foraging sites.

Other mammals

4.4.18 No badger setts were identified on Site but some potential snuffle holes were present suggesting the Site may be used for foraging.

4.4.19 The NBDC database provides records of hedgehog Erinaceus europaeus and pygmy shrew *Sorex minutus* within 500m of the site.

4.4.20 A carcass of a mallard duck could suggest otter presence, but no other signs of this species were found. The drains present on Site are largely disconnected from the wider landscape and are unlikely to be used by otter for navigation between watersheds.

4.5 Water quality

4.5.1 Water quality was classed as 'good' for the Grand Canal main line, which includes the adjacent stretch of the canal, during the 2013-2018 WFD assessment. The Camac River, into which the surface water of the Site eventually discharges, was classed as 'poor'. The recent deterioration in water quality indicates an increase in pressures coming from human activities (EPA 2019). Any additional pollutant loading from lands that discharge to the river is likely to have adverse effects on recovery of the river.

4.6 Summary

Table 6. Evaluation of the importance of species present on the site and its zone of influence and their classification as key ecological receptors.

Species group	Species present	Use of Site	Geographical importance	Conser-vation status	Approx distance from Site	Key Ecological Receptor
Plants	Listed in Appendix B	Habitat	Borough	_	On Site	No
Bats	Common pipistrelle, soprano pipistrelle, lesser noctule, Daubenton's bat and brown long-eared bat	Foraging, possibly roosting	National	HD, WA	On site and within 500 m of Site	Yes
Birds	Wintering birds	Foraging	Borough - International (European)	BD; WA, BOCCI Red and Amber	On Site and within 2 km of Site	Yes
Birds	Barn owl	Unknown	International (European)	BD, WA, BOCCI Red	On Site	Yes
Birds	Grey partridge	Breeding and foraging	National	BOCCI Red	Within 500 m of Site	Yes
Mammal	Badger	Foraging	National	WA	On Site and within 2 km	Yes
Mammal	Hedgehog	Foraging, nesting, hibernation	National	WA	Within 500 m of Site	Yes

Species group	Species present	Use of Site	Geographical importance	Conser-vation status	Approx distance from Site	Key Ecological Receptor
Mammal	Otter	Foraging	International	HD, WA	Within 1 km of site	Yes
Mammal	Pygmy shrew	Likely none	National	WA	Within 500 m of site	No
Amphibian	Common frog	Likely none	International	HD, WA	Within 500 m of site	Yes
Amphibian	Smooth newt	Likely none	National	WA	uncertain	No
Fish	Ca. 11 species of fish in the Grand Canal	None	National	FA	Within 1 km of site	Yes
Insects	Bees	Wildflowers such as green alkanet and cowslips are important for nectar	Local to national	Some species may be red listed	On site	No
BD: Birds Directive; FA: Fisheries Acts 1959-2017; HD: Habitats Directive; WA: Wildlife Act; BOCCI: Birds of Conservation Concern Ireland						

5.0 LIKELY PROGRESSION OF THE SITE UNDER A 'DO-NOTHING' SCENARIO

5.1.1 Should the site remain undeveloped, the dry meadow, hedgerows and ditches already present will remain in place. The site will likely continue to be largely unmanaged and scrub should regrow along the edges of hedgerows and encroach on parts of the dry meadow.

5.1.2 The Site would remain connected to the Grand Canal to the south and provide valuable, if somewhat isolated foraging and hunting ground for waterfowl and local wildlife.

5.1.3 Over time, more PRFs may become available for bats as trees continue to age and develop cracks and hollows.

5.1.4 Nearby available land is likely to be developed in light of the high demand for housing and services in South County Dublin even if this site remains undeveloped. The Site is already quite isolated in the landscape and it would likely become more so.

Assessments of effects

5.2 Potential impacts and effects

5.2.1 This section of the report considers the potential for effects on the ecological receptors that were identified during the desk and field studies. This assessment has been undertaken in relation to the baseline conditions, with reference to aspects of ecological structure and function on which each receptor depends. A list of potential impacts is given in Table 4 below and an assessment of their magnitude is made without taking mitigations into account.

5.2.2 These impacts are then assessed against the sensitivity of the Key Ecological Receptors that were identified during the baseline study. Mitigations are then listed for each of the likely significant impacts and a modified level of significance is given based on the scenario where mitigations are put into place. The process is presented in summary format in Table 5.

5.2.3 The determination of the significance of the predicted ecological impacts in this EcIA has been based on professional judgement. It is made with reference to the impact characteristics and the likely effect on integrity and favourable conservation status of the ecological receptor. The value assigned to the ecological receptor that will be significantly affected has been used to determine the geographical scale at which the impact is significant. However, if an impact is found not to be significant at the level at which the receptor has been valued, it may be significant at a more local level.

5.3 Designated sites

5.3.1 The Grand Canal pNHA is the only designated or proposed designated site within the immediate vicinity of the proposed development. The proximity (90m) of the pNHA suggests that there is a potential for pollutants originating from the proposed construction and occupation of the proposed development to discharge to the canal as a result of

accident or severe rainfall event. The canal bank is elevated with respect to the adjacent land and the canal is further buffered from the site by an existing development, with an established surface water drainage system, and there is no likely scenario in which a significant discharge of pollutants to the pNHA from the Site will occur.

5.3.2 Potential effects on the designation features of further designated sites, identified in Table 2 as having a, generally weak hydrological, connection with the proposed development are limited to a reduction in the foraging area available for gull species that are designation features of North Bull Island SPA, Ireland's Eye SPA and Dalkey Coastal Zone and Killiney Hill pNHA. There will be no likely significant effect on the populations of the designation species. The potential impacts of the operational phase of the proposed development on are outlined in Table 6.

Table 7. Assessment of the magnitude of likely impacts of the development without mitigations on designated sites

Designated site	Operational phase potential impacts	Magnitude (unmitigated)	Potential effects
Wicklow Mountains SAC	Increased disturbance/ trampling of upland habitats arising from increase in population in easy travelling distance	*Minor* *Extent: local* *Amount: small* *Duration: short* *Timing: Any time* *Frequency: Intermittent* Reversible: Recovery likely at probable increased pressures	*Increased erosion of upland habitats*
Dublin Bay North pNHA	No likely pathways of impact on littoral habitats	Indiscernible	N/A
Wicklow Mountains SPA	Increased disturbance of upland bird species arising from increased population in easy travelling distance.	*Indiscernible*	N/A
Dublin Bay South SAC and pNHA	No likely pathways of impact on littoral and intertidal habitats	*Indiscernible*	N/A
South Dublin Bay and River Tolka Estuary SPA	No likely impact on wintering or breeding bird species	*Indiscernible*	N/A
Dublin Bay North SAC	No likely pathways of impact on terrestrial, littoral and intertidal habitats	Indiscernible	N/A
North Bull Island SPA	Reduction in foraging area for wintering black-headed gull	Indiscernible	*N/A* Although there it is possible that small numbers of birds from the SPA wintering

Designated site	Operational phase potential impacts	Magnitude (unmitigated)	Potential effects
			population may use the site for foraging, there will be no effects at the population level.
Dalkey Coastal Zone and Killiney Hill pNHA	• No likely pathways of impact on terrestrial, littoral and intertidal habitats Reduction in foraging area for wintering herring and lesser black-backed gulls	Indiscernible	*N/A* Although it is possible that small numbers of birds from the SPA wintering population may use the site for foraging, there will be no effects at the population level.
Rockabill to Dalkey Island SAC	• No likely pathways of impact on subtidal habitats or seals	Indiscernible	N/A
Howth Head Coast SAC and pNHA	No likely pathways of impact on coastal habitats	Indiscernible	N/A
Ireland's Eye SPA	• No likely pathways of impact on breeding obligate seabirds • *Reduction in foraging area for breeding herring gull*	Indiscernible	*N/A* Although it is possible that small numbers of gulls from the SPA breeding population may use the site for foraging, there will be no effects at the population level.
Ireland's Eye SAC and pNHA	No likely pathways of impact on coastal/littoral habitats]	Indiscernible	N/A

5.4 Habitats

5.4.1 All habitats identified on the site - hedgerow, dry meadow and grassy verges, stone walls, recolonising bare ground, earth bank, spoil and bare ground, recently felled woodland and drainage ditches – will be removed and/or modified.

5.4.2 Hedgerows are generally of native species and are an integral part of the network of around 30km of hedges surveyed within the CSDZ and are of high ecological importance (Scott Cawley 2021a).

5.4.3 Non-hedgerow babitats are generally of low conservation interest. The greater part of the proposed development site consists of species-poor grassland.

5.5 Species

5.5.1 The potential impacts on species of conservation importance that have been recorded in or near the proposed development are summarized in Table 7.

Table 8. Assessment of the magnitude of likely impacts of the development on species without mitigations.

Construction phase impacts	Description	Magnitude (unmitigated)	Potential effects
Vegetation clearance	Removal of one hedgerow and parts of other hedgerows in addition to hedgerow, scrub and woodland already cleared	*Moderate* *Extent: local* *Amount: small* *Duration: short* *Timing: Any time* *Frequency: once* *Reversible: Re-planting possible*	• *Disturb nesting birds and destroy nests* • *Disturb roosting bats and destroy roosts* • *Remove hedgehog hibernation and foraging habitat*
Demolition	Demolition of one large ruined stone building *(note* Cappagh House ruin is not part of our application / to be demolished under SDZ20/021)*	*Moderate* *Extent: County* *Amount: moderate* *Duration: moderate* *Timing: Once* *Frequency: Once* *Reversible: Unlikely*	• *Destroy swallow nest* • *Disturb birds breeding nearby* • *Disturb roosting bats and destroy roosts* • *Disturb barn owls and destroy roosts*
Surface water runoff from soil excavation/infill/landscaping (including borrow pits)	Landscaping limited to less than 6.3 ha but potential run-off into open drains	*Moderate* *Extent: Could be carried several km downstream* *Amount: moderate* *Duration: moderate* *Timing: Any time* *Frequency: never to infrequent* *Reversible: Yes but difficult*	• *Negatively affect water quality of drains which could affect aquatic biodiversity* • *Impact upon water and fish in designated sites which could affect the habitats and bird populations that are qualifying interests*
Dust, noise, vibration	Some noise, dust and vibration is to be expected during construction	*Minor* *Extent:* *Amount:* *Duration:* *of construction (up to 2 years)* *Timing: working hours only* *Frequency: intermittent* *Reversible: Yes*	• *Noise will be disruptive to breeding birds* • *Vibration and noise will disturb hedgehog and pygmy shrew*
Lighting disturbance	Some lighting may be necessary if construction takes place in winter	*Moderate* *Extent: borough* *Amount: moderate*	• Lighting can affect bat behaviour and foraging area

Construction phase impacts	Description	Magnitude (unmitigated)	Potential effects
		Duration: duration of construction (up to 2 years) *Timing: working hours only* *Frequency: occasional* *Reversible: Yes*	
Storage of excavated/ construction materials	Temporary storage on site but materials to be exported from site in accordance with the Waste Management Acts	*Moderate* *Extent: Could affect the Grand Canal* *Amount: moderate* *Duration: duration of construction (up to 2 years)* *Timing: Any time* *Frequency: frequent* *Reversible: No*	• *Irresponsible storage can cause pollution events and contamination of surface water* • *Reduction in foraging habitats for badger, hedgehog*
Disposal of demolition/ construction waste	Waste management plan incorporated into CEMP	*Moderate* *Extent: Could affect the Grand Canal* *Amount: moderate* *Duration: duration of construction (up to 2 years)* *Timing: Any time* *Frequency: frequent* *Reversible: No*	• *Irresponsible disposal of waste can cause pollution events and contamination of surface water* • *Pests could be attracted* • *Wildlife could be exposed to hazardous materials*

Operational phase impacts	Description	Magnitude (unmitigated)	Potential effects
Land use change	Land use will change from dominantly grassland to residential	*Moderate* *Extent: National* *Area: small (less than 6.3 ha)* *Duration: permanent* *Reversible: Unlikely*	• *Less shelter and foraging grounds for local wildlife (birds, badger, hedgehog),* • *Environmental issues associated with housing e.g. production of municipal waste, energy and water consumption, litter*

Operational phase impacts	Description	Magnitude (unmitigated)	Potential effects
Loss of habitat	Loss of hedgerow habitat, dry meadow and wet ditches	*Moderate* *Extent: county* *Area: small (ca. 6.3 ha)* *Duration: permanent* *Reversible: Unlikely*	• *Many birds and animal species currently using the Site are unlikely to continue doing so*
Direct emission to air and water	Increased traffic locally will lead to increased emissions. Central heating and electricity use will lead to emissions to air. Housing to be connected to grid for proper wastewater treatment.	*Minor* *Extent: regional diffusion* *Amount: low to moderate (emissions from 282 units)* *Duration: permanent* *Timing: likely increase in winter* *Frequency: regular* *Reversible: could be offset*	• *Negatively affect water quality of drains which could affect aquatic biodiversity* • *Impact upon water and fish in the Grand Canal pNHA*
Surface water runoff containing contaminant or sediment	Some risk with disturbance from gardening and minor pollution events	*Minor* *Extent: Regional diffusion* *Amount: moderate* *Duration: short* *Timing: unexpected accidents* *Frequency: never to occasional* *Reversible: likely*	• *Negatively affect water quality of drains which could affect aquatic biodiversity* • *Impact upon water and fish in the Grand Canal pNHA*
Lighting disturbance	Street lights and private lighting on houses	*Minor* *Extent: Local* *Area: site and surrounding area* *Duration: permanent* *Timing: night-time* *Frequency: always* *Reversible: yes*	• *Lighting can affect bat behaviour and reduce foraging area*
Noise/vibration	Noise associated with people, pets and traffic	*Minor* *Extent: Local* *Area: site and surrounding area* *Duration: permanent* *Timing: night-time* *Frequency: always*	• *Noise may be disruptive to breeding birds*

Operational phase impacts	Description	Magnitude (unmitigated)	Potential effects
		Reversible: no	
Presence of people, vehicles and activities	Recreational activities of residents	*Minor* *Extent: Regional* *Amount: low* *Duration: permanent* *Timing: More activity in summer* *Frequency: constant* *Reversible: no*	• *Increased recreational activity can put pressures on designated sites* • *Increased presence of people will scare away shyer wildlife* • Increased use of the canal walkway may see damage to local habitats and higher incidence of spread of invasive species
Physical presence of structures (e.g. collision risks)	Two and three storey buildings will cover the majority of the site but two tall blocks of flats are also planned	*Minor* *Extent: Site area ca 6.3 ha* *Amount: Two tall flats and 2 and 3 story houses sufficient for 282 residential units* *Duration: permanent* *Reversible: no*	• *Birds and bats can suffer mortality from collision with buildings, particularly when erected in previous flight areas*
Solid waste generation	Municipal waste	*Minor* *Amount: moderate* *Duration: permanent* *Frequency: constant* *Reversible: no*	• *Leaks from sewage and improper disposal of household waste can affect surface and ground water quality and have direct negative impacts on habitats and wildlife*

Cumulative impacts	Description	Magnitude (unmitigated)	Potential effects
Surface water runoff containing contaminant or sediment	There could be cumulative effects on water quality should a number of other projects that individually would have minimal impact on water quality happen in the same area at the same time.	*Moderate to Major* *Extent: Regional diffusion* *Amount: moderate* *Duration: short* *Timing: unexpected accidents* *Frequency: never to occasional* *Reversible: likely*	• *Negatively affect water quality of drains which could affect aquatic biodiversity* • *Impact upon water and fish in the Grand Canal*

Cumulative impacts	Description	Magnitude (unmitigated)	Potential effects
Recreational pressures	Dublin has a rising population and large tracts of land purposefully zoned for housing. The creation more residential housing could see increased recreational pressures on coastal areas and beauty spots such as the Wicklow Mountains.	*Moderate* *Extent: Regional* *Amount: population growth predicted by thousand over the next few years* *Duration: permanent* *Timing: rapid increase over next 5 years* *Frequency: more frequent in summer* *Reversible: possibly*	• *Increased recreational activity can put pressures on designated sites*
Waste disposal	The generation of municipal waste could place pressure on facilities.	*Low* *Extent: Regional* *Amount: population growth predicted by thousands over the next few years* *Duration: permanent* *Timing: rapid increase over next 5 years* *Frequency: constant* *Reversible: possibly*	• *Leaks from sewage and improper disposal of household waste can affect surface and ground water quality and have direct negative impacts on habitats and wildlife*
Habitat fragmentation	There are plans to develop the entire SDZ, leaving only fragments of the original habitats for amenity purposes.	*Moderate to Major* *Extent: Borough level* *Amount: population growth predicted by thousands in Dublin over the next few years* *Duration: permanent* *Timing: rapid increase over next 5 years* *Reversible: possibly*	• *Species that would not be dramatically impacted by the proposed development because of the nearby undeveloped SDZ would no longer have access to these habitats.* • *Development of the whole SDZ will result in reduction in local range of mammals, amphibians and invertebrates.*

6.0 MITIGATION

6.1 General mitigation measures

6.1.1 A walkover survey for mammals will be undertaken in advance of construction to ensure that any mammal species that may have taken up residence in the period between the granting of planning permission and construction of the scheme can be appropriately considered and treated should they be encountered.

6.1.2 Removal of vegetation will take place outside of the bird breeding season (1st March to 31st August) or after a thorough survey for the presence of any nests in and within at least 5 m of the area to be impacted by a suitably qualified ecologist immediately prior to commencement of the work.

6.1.3 Potential ecological effects will be managed during construction through the implementation of a Construction Environmental Management Plan (CEMP). This will set out best practice construction methods and safe working practices to be followed so as to limit construction impacts, along with appropriate mitigation and management measures to avoid pollution of local watercourses, and the incidental injury or mortality of protected species, including amphibians, bats, reptiles, nesting birds, and badgers.

6.1.4 Construction works will be carried out under the supervision of a suitably experienced and licensed ecologist.

6.2 Designated sites

6.2.1 The great majority of the designated sites that have been considered in this assessment (Table 2) are unlikely to be affected by the proposed development (Table 6), on account of their distance from the Site and/or their tenuous hydrological connection with the Site. The Grand Canal pNHA is the closest (proposed) designated site to the development and is at the greatest risk of adverse effects from the works and residential occupation of the Site. Risks to the pNHA and its conservation interest reside in the potential for pollutants, including silt, cementitious liquors and hydrocarbons to discharge into the canal as a result of accident or high rainfall event. Standard pollution control measures, which will include stockpile management, surface water management and management of vehicles both on site and whilst entering and leaving the Site will eliminate the risk of pollutants entering the canal. These mitigation/avoidance measures will be incorporated in a Construction Environmental Management Plan (CEMP). The developed site will be connected to the regional surface water and foul water system, and there will be low risk of contamination of the pNHA during the occupation of the Site

6.3 Habitats

6.3.1 As much of the existing habitats as possible will be retained, including external hedges (H1, H2) and scrub that separates the Site from the station car park. Where trees are to be retained, barriers should erected to prevent stockpiling or compaction from vehicles in the rooting zone. Compensatory lines of trees will be planted along the northern and eastern Site boundaries. An invasive non-native species management plan should be

implemented during construction to avoid spread of the INNS identified on the Site (INNS Map; Figure 3).

6.4 Species

Bats

6.4.1 Bat surveys are to be undertaken prior to felling trees with bat roost potential. Felling of such trees will take place between April and May or September and October and either gently pushed over with heavy machinery or carefully felled 'in section', giving bats an opportunity to escape.

6.4.2 If any bat roosts are confirmed, bats will be removed by an ecologist operating under licence. Bat boxes will be provided to replace any destroyed roosts.

6.4.3 Lighting of the Site during construction will be sensitive to the presence of bats. Downlighting will be used and it will be time limited as much as possible and lighting of ecologically sensitive areas such as trees, hedgerows and waterways, will be avoided.

6.4.4 The presence of high-rise buildings provides a collision hazard for bats; and pets such as cats could also become an occasional hazard. Retaining or planting some taller trees in the site boundaries could mitigate against the collision hazard.

6.4.5 Due to the loss of potential roosting sites for bats, compensation in the form of bat boxes is likely to be necessary.

Other Mammals

6.4.6 Badgers in setts are extremely sensitive to excavation works and vibration during the construction phase. Although no setts were identified during the field survey, badgers can move around at short notice and a badger survey will be done on a precautionary basis immediately prior to any construction work by the ECoW. However, due to the disconnected nature of the Site, badger activity is likely to be low and the impact of the proposed development on this species is likely to be minimal.

6.4.7 Removal of hedgerows and scrub should be incremental, under the supervision of the ECoW, in order to minimize risks to hedgehogs.

6.4.8 Otter may be found along the Grand Canal and occasionally utilise the Site of proposed development, but effects on this species are likely to be minimal.

Birds

6.4.9 All birds breeding on site can be potentially impacted by vegetation clearance during the construction phase. This will be mitigated by clearing vegetation outside of the breeding season (March to August inclusive) or after a targeted survey for nests by an Ecological Clerk of Works. Breeding birds may also be affected by noise, vibration and potentially the improper disposal of construction waste. This is mitigated for by maintaining a buffer around retained vegetation wherever possible.

Wintering birds

6.4.10 The loss of dry meadow will likely affect wintering birds in the long term as it means a loss of foraging habitat.

Grey partridge

6.4.11 Potential grey partridge nesting habitat along hedgerows will be cleared outside the breeding season or under the supervision of the ECoW.

Barn owl

6.4.12 The ruined building will be surveyed for indications that it is in use by barn owl; if evidence is found demolition will be deferred until after the young have fledged. A buffer should be enforced around the building in order to prevent disturbance of nesting birds.

Swallow

6.4.13 Since old swallow nests were identified in the stone building on Site, demolition of this structure will be carried out outside the breeding season or after a targeted survey by a qualified ecologist immediately prior to demolition to ensure the structure is not in current use.

Amphibians

6.4.14 If construction is to commence between February and midsummer, any ponds and waterways that could support common frog will be checked for frogs or tadpoles. Translocation shall take place under licence when necessary.

6.4.15 Newts are unlikely to be present on the site as most of the ditches containing water were assessed as having poor suitability for newt. Should ponds be restored to a suitable condition; - through the planting of aquatic plants, and the maintenance of permanent ponds, it is quite likely that newts could return to site, post-construction. If any signs of newt become apparent during development, work shall halt immediately until the newts can be translocated by an ecologist under licence.

Fish

6.4.16 The Site of proposed development is situated at a sufficiently large distance from the Grand Canal that pollution incidents are unlikely.

6.4.17 The local drains discharge into the Camac River via the stormwater drainage network to the east of the Site. Contaminated surface run-off has the potential to adversely impact on fish in the Camac, particularly as water quality is already known to be poor.

6.4.18 In order to avoid any incidents during the construction phase, the CEMP will be carefully observed and all materials stored securely away from watercourses and all waste disposed of responsibly. There should be no residual effects on fish provided this is done.

6.5 Water quality

6.5.1 Surface water draining infrastructure will be put in place and will include attenuation ponds. Surface water runoff from the subject site would be attenuated to greenfield runoff

rates. An agreed outflow rate of 3.1 l/s/ha for all events up to the design Q100 event is to be adopted. The above agreed rate from the overall SDZ lands were modelled on behalf of South Dublin County Council and it was concluded that there would be no significant effect on downstream flows. Surface water discharge will pass via a fuel / oil separator.

6.5.2 A new wastewater pumping station is to be constructed near the R113 Font Hill Road and foul water will be moved from there to a wastewater treatment plant.

6.5.3 The CEMP will see to the implementation of specific measures to minimize the risk of water pollution during construction. Loss of sediment to watercourses will be minimized as much as possible and only attenuated, silt-free water will be directed towards ditches. Dangerous substances will be stored in bunded areas away from water courses and a register maintained. Weather conditions shall be taken into account when planning construction activities to minimize risk of run-off from the site. Washout areas will be located remote from any surface drainage features and washing out of concrete trucks on Site will be avoided altogether. Spill kits will be carried by all mobile fuel bowsers and operatives will be trained in their use. Emergency procedures will be put in place and construction staff will be provided with emergency response training. Wheel wash facilities using recycled water will be provided at all site egress points. The water will be drained through appropriate filter material prior to discharge from the construction site. Excavated materials hauled in trucks will be covered by a tarpaulin to prevent accidental losses. A discovery procedure for contaminated material will be implemented and any contaminated waste will be disposed of as stipulated in the Waste Management Act.

6.5.4 There should be no residual effects on water quality provided these mitigations are observed.

6.6 Summary and assessment

Table 9. Assessment of likely significant effects on Key Ecological Receptors identified in Section 4 above, before and after mitigation measures are implemented.

Key Ecological Receptor	Potential impact	Sensitivity of Receptor	Likelihood of occurrence	Significance of likely effects (unmitigated)	Mitigation	Significance of likely effects (mitigated)
Designated Sites						
The Grand Canal pNHA	**Construction phase** • *Surface water runoff containing contaminant or sediment from soil excavation/ infill/landscaping (including borrow pits)* • *Spread of invasive non-native species* • *Storage of excavated/construction materials* **Operational phase** • *Surface water runoff containing contaminant or sediment* • *Waste disposal* • *Recreational pressures* **Cumulative effects** • *Surface water runoff containing contaminant or sediment* • *Recreational pressures* • *Waste disposal*	**Medium sensitivity** to water quality, invasive species and recreational pressure	**Low** for water contamination **Moderate to high** for recreational pressure **Moderate** for invasive species	**Construction phase** • *Moderate* **Operational phase** • *Minor to moderate* **Cumulative effects** • *Minor to moderate*	• *Put standard good practice procedures in place to prevent contamination of surface runoff during construction phase* • *Regional recreational pressures are managed by the local authorities in the Development Plans for the relevant area* • *Implement an INNS management plan during the construction phase*	**Construction phase** • *Negligible* **Operational phase** • *Negligible* **Cumulative effects** • *Negligible*

Key Ecological Receptor	Potential impact	Sensitivity of Receptor	Likelihood of occurrence	Significance of likely effects (unmitigated)	Mitigation	Significance of likely effects (mitigated)
Wicklow Mountains SAC (IE002122)	Construction phase • *None* Operational phase • *Recreational pressures* Cumulative effects • *Recreational pressures*	High sensitivity to recreational pressure	**Low** for recreational pressure	Construction phase • *None* Operational phase • *High* Cumulative effects • *High*	Regional recreational pressures are managed by the local authorities in the Development Plans for the area	Construction phase • *None* Operational phase • *Negligible* Cumulative effects • *Negligible*
Wicklow Mountains SPA (IE004040)	Construction phase • *None* Operational phase • *Land use change* Cumulative effects • *Habitat fragmentation*	Low sensitivity to land use change outside of SPA boundaries	**High**	Construction phase • *None* Operational phase • *Negligible* Cumulative effects • *Negligible*	Regional development strategies are managed by the local authorities in the Development Plans for the area	Construction phase • *None* Operational phase • *Negligible* Cumulative effects • *Negligible*
Coastal sites designated primarily for habitats (Dublin Bay North SAC and pNHA; Dublin Bay South SAC and	Construction phase • *Surface water runoff containing contaminant or sediment from soil excavation/ infill/landscaping (including borrow pits)* • *Spread of invasive non-*	Low sensitivity to all as distance will substantially reduce effects	**Low** for all because of large distance separating the site of proposed	Construction phase • *Negligible* Operational phase • *Negligible* Cumulative effects	• *Put standard good practice procedures in place to prevent contamination of surface runoff during construction phase* • *Regional recreational pressures are*	Construction phase • *Negligible* Operational phase • *Negligible* Cumulative effects

Key Ecological Receptor	Potential impact	Sensitivity of Receptor	Likelihood of occurrence	Significance of likely effects (unmitigated)	Mitigation	Significance of likely effects (mitigated)
pNHA; Dalkey Coastal Zone and Killiney Hill pNHA; Rockabill to Dalkey Island SAC; Howth Head SAC and pNHA; Ireland's Eye SAC and pNHA)	*native species* Operational phase • *Surface water runoff containing contaminant or sediment* • *Waste disposal* • *Recreational pressures* Cumulative effects • *Surface water runoff containing contaminant or sediment* • *Recreational pressures* Waste disposal		development from receptors	• *Negligible*	*managed by the local authorities in the Development Plans for the relevant area* • *Implement an INNS management plan during the construction phase*	• *Negligible*
Coastal sites designated primarily for birds (South Dublin Bay and River Tolka Estuary SPA; Howth Head SPA; North Bull Island SPA; Ireland's Eye SPA)	Construction phase • *Dust, noise, vibration* Operational phase • *Land use change* • *Waste disposal* • *Recreational pressures* Cumulative effects • *Habitat fragmentation* • *Recreational pressures* • *Waste disposal*	Low sensitivity to all as distance will substantially reduce effects and alternative foraging sites are available	**Low** for all because of large distance separating the site of proposed development from receptors	Construction phase • *Negligible* Operational phase • *Negligible* Cumulative effects Negligible to minor	• *Regional recreational pressures and land use change associated with development are managed by the local authorities in the Development Plans for the relevant area*	Construction phase • *Negligible* Operational phase • *Negligible* Cumulative effects • *Negligible*

Key Ecological Receptor	Potential impact	Sensitivity of Receptor	Likelihood of occurrence	Significance of likely effects (unmitigated)	Mitigation	Significance of likely effects (mitigated)
Habitats						
Hedgerows, dry meadow and woodland	**Construction phase** • *Vegetation clearance* • *Dust, noise, vibration* **Operational phase** • *Land use change* • *Loss of habitat* **Cumulative effects** • *Loss of habitat* • *Land use change* • *Habitat fragmentation*	**High sensitivity** to all listed impacts from development	**High** for all	**Construction phase** • *High* **Operational phase** • *High* **Cumulative effects** • *High*	• *Only remove scrub, trees and vegetation when it cannot be avoided* • *Avoid undue disturbance of vegetation* • *Implement measures set out in the CEMP* • *Retain green space on a proportion of the Site* • *Consider landscape connectivity in design plans*	**Construction phase** • *Moderate* **Operational phase** • *High* **Cumulative effects** • *Moderate*
Species						
Plants	**Construction phase** • *Vegetation clearance* • *Disposal of demolition/construction waste* • *Storage of excavated/construction materials* **Operational phase** • *Land use change* • *Loss of habitat* • *Direct emission to air and water* • *Surface water containing*	**High sensitivity** to loss of habitat **Moderate sensitivity** to all other listed impacts	**High** for all	**Construction phase** • *High* **Operational phase** • *Moderate* **Cumulative effects** • *Moderate*	• *Only remove scrub, trees and vegetation when it cannot be avoided* • *Avoid undue disturbance of vegetation around retained hedgerows* • *Retain some marginal land with primroses* • *Implement measures set out in the CEMP* • *Retain green space on a proportion of the Site*	**Construction phase** • *Negligible* **Operational phase** • *Negligible* **Cumulative effects** • *Negligible*

Key Ecological Receptor	Potential impact	Sensitivity of Receptor	Likelihood of occurrence	Significance of likely effects (unmitigated)	Mitigation	Significance of likely effects (mitigated)
	contaminant • *Presence of people, vehicles and activities* • *Lighting* **Cumulative effects** • *Loss of habitat* • *Habitat fragmentation*				• *Consider landscape connectivity in design plans* • *Direct light away from vegetated areas*	
Bats	**Construction phase** • *Vegetation clearance* • *Demolition* • *Lighting disturbance* **Operational phase** • *Presence of people, vehicles and activities* • *Physical presence of structures* • *Loss of habitat* • *Lighting disturbance* **Cumulative effects** • *Loss of habitat* • *Habitat fragmentation*	**High sensitivity** to all listed impacts from development	**Moderate to high likelihood**	**Construction phase** • *Moderate* **Operational phase** • *Moderate* **Cumulative effects** • *Moderate*	• *Only remove scrub, trees and vegetation when it cannot be avoided* • *A bat survey will be undertaken to determine whether the trees and stone building are used as roosts* • *Any bats in known roosts will be removed under licence prior to demolition/felling* • *Demolition/felling of trees/structures with roosting potential will proceed in a bat sensitive manner as outlined in the CEPM* • *Consider site connectivity in planning, particularly connections with the Canal to the south* • *Put up environmentally*	**Construction phase** • *High (potentially)* **Operational phase** • *Minor* **Cumulative effects** • *Negligible*

Key Ecological Receptor	Potential impact	Sensitivity of Receptor	Likelihood of occurrence	Significance of likely effects (unmitigated)	Mitigation	Significance of likely effects (mitigated)
					sensitive lighting and keep areas near vegetation dark	
Badger	**Construction phase** • *Vegetation clearance* • *Noise/vibration* • *Disposal of demolition/ construction waste* **Operational phase** • *Land use change* • *Presence of people, vehicles and activities* **Cumulative effects** • *Restriction in foraging area*	**High sensitivity** to vibration and excavation work **Medium** sensitivity to habitat fragmentation **Low** sensitivity to land use change presence of people	**Moderate likelihood**	**Construction phase** • *Minor* **Operational phase** • *Minor* **Cumulative effects** • *Minor*	• *A survey for badger setts by the ECoW will take place immediately prior to construction work* • *Should a sett be found, exclusion of the badger will be done under licence*	**Construction phase** • *Negligible* **Operational phase** • *Negligible* **Cumulative effects** • *Negligible*
Hedgehog	**Construction phase** • *Vegetation clearance* • *Disposal of demolition/ construction waste* **Operational phase** • *Habitat loss* • *Presence of people, vehicles and activities* Cumulative effects • *Loss of habitat* • *Habitat fragmentation*	**High sensitivity** to habitat loss and vegetation clearance **Medium** sensitivity to habitat fragmentation Low sensitivity presence of people	**High likelihood**	**Construction phase** • *High* **Operational phase** • *Moderate* **Cumulative effects** • *Moderate*	• *Only remove scrub, trees and vegetation when it cannot be avoided* • *Avoid undue disturbance of vegetation* • *Implement measures set out in the CEMP* • *Retain green space on a proportion of the Site* • *Consider landscape connectivity in design plans*	**Construction phase** • *Minor* **Operational phase** • *Minor* **Cumulative effects** • *Negligible*
Otter	**Construction phase** • *Dust, noise, vibration* **Operational phase** • *Land use change* • *Presence of people,*	**Low** sensitivity to all listed impacts from development as	**Moderate likelihood**	**Construction phase** • *Minor* **Operational phase**	• *Only remove scrub, trees and vegetation when it cannot be avoided* • *Avoid undue*	**Construction phase** • *Minor* **Operational phase**

Key Ecological Receptor	Potential impact	Sensitivity of Receptor	Likelihood of occurrence	Significance of likely effects (unmitigated)	Mitigation	Significance of likely effects (mitigated)
	vehicles and activities **Cumulative effects** • *Surface water runoff containing contaminant or sediment* • *Land use change*	use of the site appears to be limited		• *Minor* **Cumulative effects** • *Minor*	*disturbance of vegetation* • *Implement measures set out in the CEMP* • *Retain green space on a proportion of the Site* • *Put standard good practice procedures in place to prevent contamination of surface runoff during construction phase*	• *Minor* **Cumulative effects** • *Minor*
Smooth newt	**Construction phase** • *Vegetation clearance* • *Removal/covering of ditches* **Operational phase** • *Land use change* • *Loss of habitat* **Cumulative effects** • *Surface water runoff containing contaminant or sediment* • *Loss of habitat* • *Land use change*	**High** sensitivity to removal/covering of ditches, loss of habitat and vegetation clearance	**Low likelihood**	**Construction phase** • *High* **Operational phase** • *Moderate* **Cumulative effects** • *Moderate*	• *Only drain standing water and remove scrub, trees and vegetation when it cannot be avoided* • *Avoid undue disturbance of vegetation* • *Implement measures set out in the CEMP* • *Retain green space on a proportion of the Site*	**Construction phase** • *Moderate (potentially)* **Operational phase** • *Moderate (potentially)* **Cumulative effects** • *Moderate (potentially)*
Common frog	**Construction phase** • *Vegetation clearance* • *Removal/covering of ditches* **Operational phase**	**High** sensitivity to removal/covering of ditches, loss of habitat and vegetation clearance	**Low likelihood**	**Construction phase** • *High* **Operational phase**	• *Only drain standing water and remove scrub, trees and vegetation when it cannot be avoided*	**Construction phase** • *Moderate* **Operational phase**

Key Ecological Receptor	Potential impact	Sensitivity of Receptor	Likelihood of occurrence	Significance of likely effects (unmitigated)	Mitigation	Significance of likely effects (mitigated)
	• *Land use change* • *Loss of habitat* **Cumulative effects** • *Surface water runoff containing contaminant or sediment* • *Loss of habitat* • *Land use change*			• *Moderate* **Cumulative effects** • *Moderate*	• *Avoid undue disturbance of vegetation* • *Implement measures set out in the CEMP* • *Retain green space on a proportion of the Site*	• *Moderate* **Cumulative effects** • *Moderate*
Barn owl	**Construction phase** • *Vegetation clearance* • *Demolition* • *Dust, noise, vibration* **Operational phase** • *Land use change* • *Loss of habitat* • *Lighting disturbance* • *Presence of people, vehicles and activities* **Cumulative effects** • *Loss of habitat* • *Land use change*	**High** sensitivity to demolition, lighting disturbance, presence of people and loss of habitat	**Moderate likelihood**	**Construction phase** • *High* **Operational phase** • *High* **Cumulative effects** • *Moderate*	• *Undertake a specific barn owl survey to determine whether the species utilises the Site*	**Construction phase** • *High (potentially)* **Operational phase** • *High (potentially)* **Cumulative effects** • *Moderate (potentially)*
Grey partridge	**Construction phase** • *Vegetation clearance* • *Noise/vibration* • *Disposal of demolition/ construction waste* **Operational phase** • *Loss of habitat* • *Land use change* • *Presence of people,*	**Medium sensitivity** to all listed impacts from development	**High likelihood**	**Construction phase** • *Moderate* **Operational phase** • *Moderate* **Cumulative effects** • *Moderate*	• *Only remove scrub, trees and vegetation when it cannot be avoided* • *Avoid undue disturbance of vegetation* • *Implement a clear plan for safe storage of building materials on*	**Construction phase** • *Minor* **Operational phase** • *Moderate* **Cumulative effects** • *Minor*

Key Ecological Receptor	Potential impact	Sensitivity of Receptor	Likelihood of occurrence	Significance of likely effects (unmitigated)	Mitigation	Significance of likely effects (mitigated)
	vehicles and activities **Cumulative effects** • *Loss of habitat*				site • *Limit access to the site to authorised persons only* • *Retain green space on a proportion of the Site* • *Implement measures set out in the CEMP*	
Swallow	**Construction phase** • *Demolition* • *Noise/vibration* **Operational phase** • *Land use change* • *Habitat loss* • *Physical presence of structures (e.g.. collisions)* **Cumulative effects** • *Habitat fragmentation*	**Moderate sensitivity** to all listed impacts from development	**High likelihood**	**Construction phase** • *Moderate* **Operational phase** • *Moderate* **Cumulative effects** • *Moderate*	• *Demolition of stone building to take place outside of breeding season or under supervision of a qualified ecologist* • *Retain green space on a proportion of the Site* • *Consider landscape connectivity in design plans*	**Construction phase** • *Negligible* **Operational phase** • *Moderate* **Cumulative effects** • *Minor*
Wintering birds	**Construction phase** • *Vegetation clearance* • *Noise/vibration* • *Disposal of demolition/ construction waste* **Operational phase** • *Loss of habitat* • *Land use change* • *Presence of people, vehicles and activities* **Cumulative effects** • *Land use change*	**Medium sensitivity** to all listed impacts from development	**High likelihood**	**Construction phase** • *Moderate* **Operational phase** • *Moderate* **Cumulative effects** • *Moderate*	• *Implement a clear plan for safe storage of building materials on site* • *Limit access to the site to authorised persons only* • *Retain green space on a proportion of the Site* • *Implement measures set out in the CEMP* • *Regional land use change associated with*	**Construction phase** • *Minor* **Operational phase** • *Moderate* **Cumulative effects** • *Minor*

Key Ecological Receptor	Potential impact	Sensitivity of Receptor	Likelihood of occurrence	Significance of likely effects (unmitigated)	Mitigation	Significance of likely effects (mitigated)
					development are managed by the local authorities in the Development Plans for the relevant area	
All other birds breeding on site (listed in Appendix 5)	**Construction phase** • *Vegetation clearance* • *Noise/vibration* • *Disposal of demolition/ construction waste* **Operational phase** • *Loss of habitat* • *Land use change* • *Presence of people, vehicles and activities* • *Physical presence of structures (e.g. collisions)* **Cumulative effects** • *Habitat fragmentation*	**Medium sensitivity** to vegetation clearance **Low sensitivity** to all other impacts	**High likelihood**	**Construction phase** • *Moderate* **Operational phase** • *Minor* **Cumulative effects** Minor	• *Only remove scrub, trees and vegetation when it cannot be avoided* • *Clearance of vegetation is to take place outside of the bird breeding season or under supervision of a qualified ecologist* • *Avoid undue disturbance of vegetation* • *Implement a clear plan for safe storage of building materials on site* • *Limit access to the site to authorised persons only*	**Construction phase** • *Negligible* **Operational phase** • *Minor* **Cumulative effects** Negligible
Fish	**Construction phase** • *Surface water runoff containing contaminant or sediment from soil excavation/ infill/landscaping (including borrow pits)* **Operational phase** • *Surface water runoff*	**Medium sensitivity** to all listed impacts from development	**Low likelihood**	**Construction phase** • *Moderate* **Operational phase** • *Moderate* **Cumulative effects** • *Minor to*	• *Put standard good practice procedures in place to prevent contamination of surface runoff during construction phase* • *Implement measures set out in the CEMP*	**Construction phase** • *Negligible* **Operational phase** • *Negligible* **Cumulative effects** • *Negligible*

Key Ecological Receptor	Potential impact	Sensitivity of Receptor	Likelihood of occurrence	Significance of likely effects (unmitigated)	Mitigation	Significance of likely effects (mitigated)
	containing contaminant or sediment • *Waste disposal* **Cumulative effects** • *Surface water runoff containing contaminant or sediment* • *Waste disposal*			*Moderate*		

7.0 COMPENSATION, ENHANCEMENT AND MONITORING

7.1 Habitats

7.1.1 Clearance of the woodland and most of the hedgerow on Site was deemed necessary in order to attain the planning objectives. The permanent change in land use from dry meadow to built environment and amenity is also unavoidable. This will affect several key ecological receptors of the Site – both habitats and species- and thus compensation measures are necessary.

7.1.2 Any lengths of hedgerow that will be/have been removed should be replaced with an equal or greater length of native species-rich hedgerow. The approximate length of hedgerow originally present on the Site was measured as 575 m but large parts of H1, H2 and H4 are likely to remain in place, so compensation may be limited largely to H3 and H5, a combined length of approximately 200 m.

7.1.3 Trees should also be planted in compensation for the area of woodland that was felled around the old stone building in connection with under granted permission SDZ20A/0021 at the south-east of the Site. This covered an area of ca. 0.59 ha. The former species composition was unclear at the time of visit, but appears to have contained ash, sycamore and willow. Replanting with native species is recommended. The removal of the invasive plant species present in this area can be considered an enhancement of the Site, if done successfully.

7.2 Species

7.2.1 The mitigations that are to be put in place during the construction and operational phases of development were not deemed to fully negate likely significant effects on all species. Residual effects remain for plants, bats, hedgehog, otter, common frog, grey partridge, swallow, breeding birds and wintering birds and potentially for smooth newt and barn owl, depending on their presence on site. Residual effects are also likely on the flora, which is likely to be locally depleted with the change in land use.

7.2.2 RSK Ireland were commissioned to produce a Biodiversity Management Plan, aimed at mitigating any potential impacts caused by the development. The sinking of a pond, which will have native aquatic vegetation will benefit breeding amphibians and, along with new wildflower meadows, will provide greater insect numbers for foraging bats. The implementation of bat and bird boxes in trees, as well as the enhancement of hedgerows on site and planting of new trees will benefit both bats and birds on site. Insect motels are also recommended to entice greater numbers of invertebrates on available habitats on site. Further information can be found within the BMP.

Amphibians

7.2.3 Common frog is likely to be present on the site and if all the ditches with standing water cannot be retained then the creation of nature based SuDs in compensation should be considered. These can double up as compensatory habitat for newts and would be a beneficial enhancement to the Site even if frogs and newts are not found to currently utilise the Site. An increased number of suitable habitat present over a wider region increases the suitability of habitats in the area for newts. After the creation of nature based SuDS, annual surveys could be considered over the next five years to assess their effectiveness.

7.2.4 Surveys for smooth newt and barn owl should determine whether these species are present and whether they may be affected by the proposed development. Although smooth newt were not found to be present, the creation of nature-based SuDS to support both frogs and newts may be considered as an enhancement measure that would entice amphibians back to newly redeveloped ponds.

Bats

7.2.5 Residual effects on bats are likely in two ways; a loss of foraging habitat and a loss in roosts. The change in land use and the removal of linear habitats is likely to affect foraging behaviour of bats locally. Connectivity to the Grand Canal would be poor and this issue is not addressed by current mitigation measures.

7.2.6 Several large trees were deemed to have with low and moderate bat roost potential from the initial survey although subsequent endoscoping concluded that these are being used by bats, transect surveys are still in process. While many of these are to be retained in H1, H2 and H4, the close proximity of buildings and lighting may result in disturbance to bats. Bat boxes should be put up at suitable locations in compensation.

7.2.7 The ruin of Cappagh House building contains chimneys with bat roost potential. The contractor appointed under granted permission SDZ20A/0021 will be responsible for Bat emergence/re-entry surveys and mitigation measure. As this building is within the confines of the site compensatory bat boxes should be considered.

7.2.8 Bat activity surveys should be considered before construction and at least once after construction to assess the effect of the development and the compensation measures that were implemented.

Other mammals

7.2.9 Hedgehog and otter are both likely to suffer residual effects through loss of habitats and land use change. Hedgehog can also suffer from a lack of connectivity in habitats. Therefore, the removal of hedgerows and woodland should be compensated by the strategic placement of new hedgerow and trees which allow for movement of hedgehog between habitats.

7.2.10 Otter is unlikely to utilize the site to a great extent but the land use change represents a loss of potential foraging habitat and resting site close to the Grand Canal, where the walkway provides little cover. A compensation that could be considered is to set aside the undeveloped land between the Canal, the R113, the Site and a housing estate to the east and manage it for wildlife.

Birds

7.2.11 The loss of habitat and nesting space that removal of lengths of hedgerow would represent would be compensated for by the planting of new, preferably native species-rich hedgerow of at least equal length. The loss of the woodland may be compensated by planting trees around the Site or setting aside an area for wildlife to the south of the Site. Birds also appear to be nesting in the stone building that is to be demolished. The loss of this nesting space should be compensated for by putting up bird boxes around the new development.

7.2.12 An unused swallow's nest was observed in the stone building to be demolished. The new housing to be built on the Site is likely to provide alternative nesting space for swallow. Incorporation of swift brick in the walls of houses during construction could be considered as an enhancement feature.

7.2.13 An area could be set aside and planted with a mix wildflowers and cereal to encourage grey partridge, which is known to occur locally. This is most likely to be effective if done off the Site near the Canal, which is the only area with connectivity across the R113.

7.2.14 The loss of foraging habitat for wintering birds, some species of which represent qualifying features of regional SPAs, is likely to have a higher impact when the rest of the SDZ is developed. A set-aside area could be considered for wintering birds to compensate for the entire SDZ scheme.

7.2.15 Should barn owl be found to utilise the Site, compensation measures should be taken which would involve the installation of barn owl roosting boxes at suitable locations. Annual monitoring of these is recommended to see if and when the species takes up residence.

7.2.16 Bird boxes for hole-nesting species can be put up on the side of the new houses and at other suitable locations on site to compensate for the disturbance and loss of breeding habitat to birds.

7.2.17 At least one breeding bird survey should be considered on the Site after construction to assess the impact of the development on the local bird populations.

7.2.18 Monitoring for wintering bird species would best be done over the entire SDZ.

8.0 CONCLUSIONS

8.1.1 The proposed development is part of the Clonburris Strategic Development Zone Planning Scheme developed by South Dublin County Council. The 6.3 ha site is to contain a housing estate with 283 residential units. Its proximity to the Grand Canal pNHA and the undeveloped lands of the SDZ which extends to the west across the R113 have been considered when assessing the ecological impacts of the project. Undeveloped lands are becoming increasingly scarce in the greater Dublin area as the city expands and regional policies must ensure that there is no overall loss of biodiversity.

8.1.2 No residual effects are envisaged on any EU designated sites; the closest that has a pathway of connection to the proposed development is 10.5 km away. The hydrological connection of the Site to Dublin Bay is weak and the proposed development is unlikely to have any effect on its water quality. However, bird species from coastal SPAs spend time foraging inland and they utilize the open fields that are subject to regular flooding in winter. While no geese were found during surveying, and none are expected to be found during development, works should be halted temporarily in the event any qualifying species from nearby SPAs be found on site. This will be referenced in the project CEMP.

8.1.3 The Site is poorly connected with the wider landscape but does contain a number of internally connecting hedgerows and there is access to the Canal to the south. This means the Site provides good foraging ground but is unlikely to be used extensively by larger mammals such as badger. It provides nesting and foraging habitat to a range of bird species. There are a number of non-regulated invasive plant species present on the Site, removal of which could be considered a Site enhancement. Although standing water in ditches were degraded and do not support amphibians, the creation of nature based SuDS will be a positive step to compensate and enhancement against habitat loss.

8.1.4 A feature of the Site is an old stone building of Cappagh House which provides nesting space for birds and roosting habitat for a number of bats in the area.

8.1.5 The use of bat and bird boxes in trees onsite are recommended in order to mitigate the impact development will have on these species.

8.1.6 After assessment of the key ecological receptors on the Site and the likely impact of the proposed development, it was found that the proposed mitigation measures cannot fully prevent residual adverse impacts. A number of compensation measures are proposed, including the erection of bat and bird boxes, the set aside of an area of land to be managed for wildlife and the compensatory planting of native hedgerows and trees. The creation of nature based SuDS i.e. swales, suitable for amphibians can be done as a compensation or enhancement.

8.1.7 Further surveys are recommended to be conducted during development. These ecological works should be supervised by a suitably qualified ecologist acting as an Ecological Clerk of Works (ECoW), (e.g. removal of mature trees having bat roost potential, removal of vegetation with suitability for nesting hedgehog or breeding birds).

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Figure 3. Invasive Non-Native Species (INNS) map

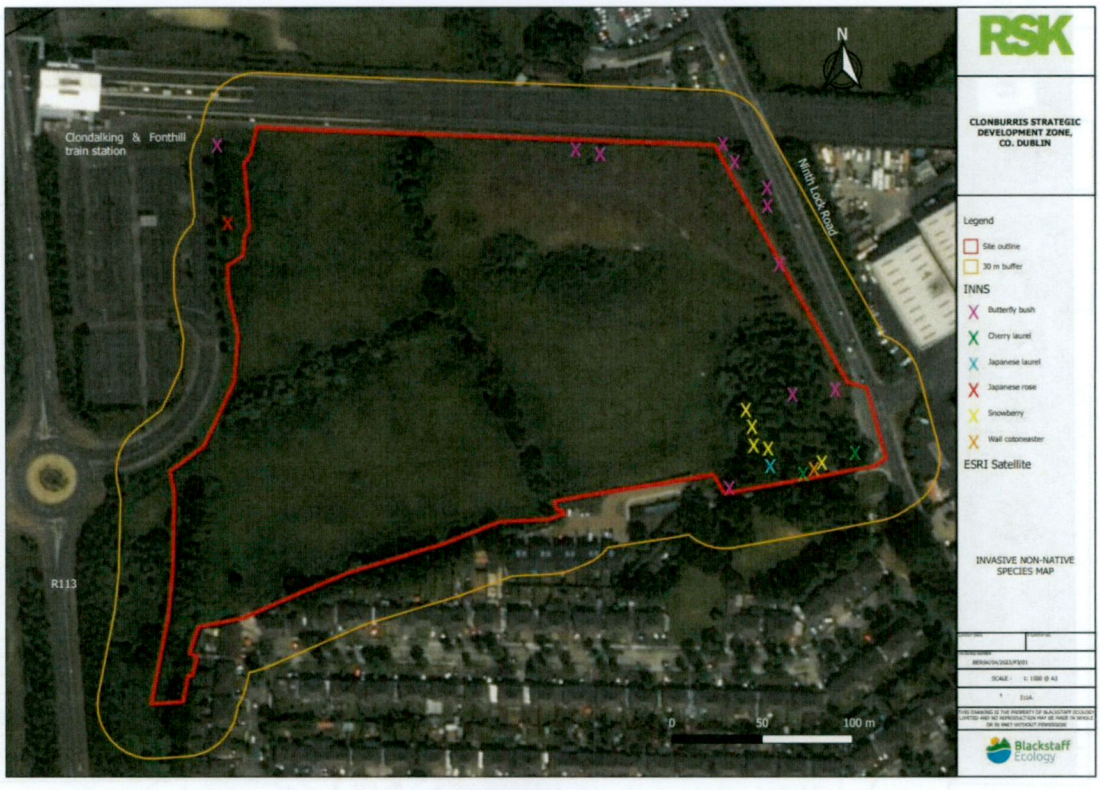
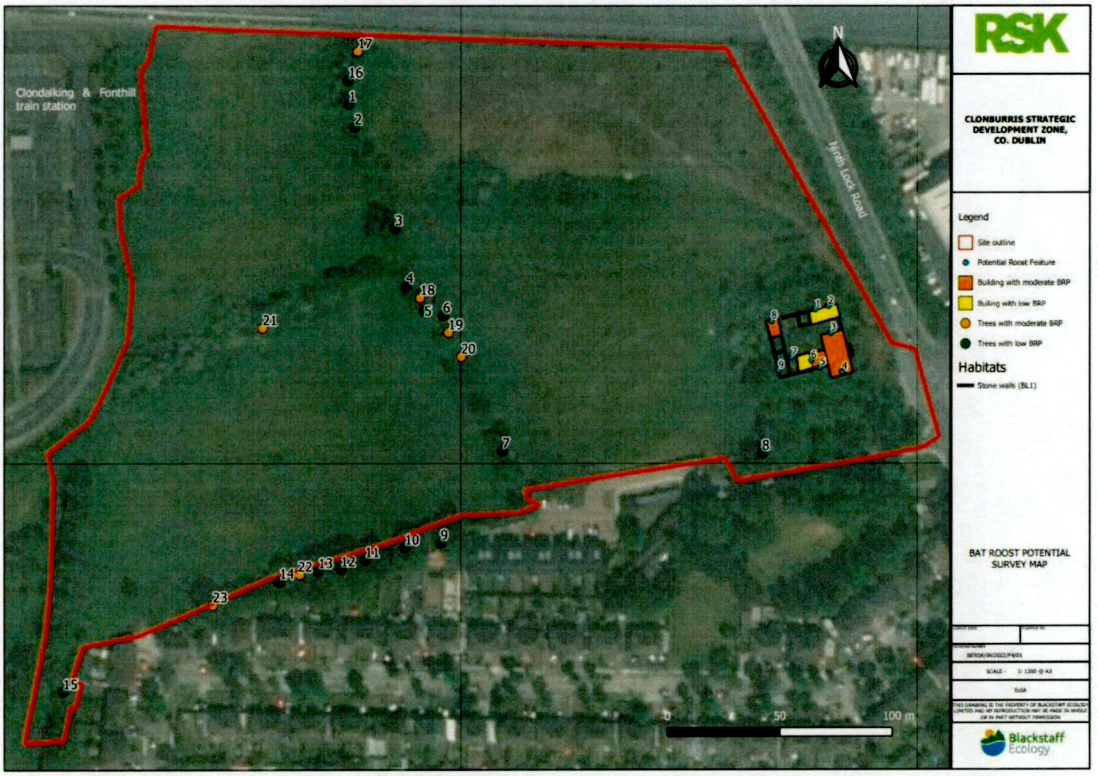


Figure 4. Bat Roost Potential survey map



APPENDIX A – PHOTOGRAPHS

Photo 1. Field 1 (F1) showing cleared scrub.

Photo 2. Northern edge of H1 showing cleared scrub and severely pruned back hedge.

Photo 3. Recolonising bare ground.

Photo 4. Old stone building without roof in area of recently cleared woodland.

Photo 5. Hedge 4 (H4)

Photo 6. Ditch filled with water at south-western end of site.

Photo 7. Hedge 5 (H5); recently cut.

Photo 8. Hedge 3 (H3); pruned back and with western end removed.

Photo 9. Field 3 (F3);

APPENDIX B – PLANT SPECIES LIST

Scientific name	Common name	Scientific name	Common name
Acaena spp	Piri-piri burr	*Medicago lupulina*	Black medick
Acer pseudoplatanus	Sycamore	*Narcissus spp*	Daffodils
Acuba japonica	Japanese laurel	*Pentaglottis sempervirens*	Green alkanet
Agrostis capillaris	Common bent	*Phalaris arundinacea*	Reed canary-grass
Agrostis stolonifera	Creeping bent	*Phleum pratense*	Timothy
Arrhenatherum elatius	False oat-grass	*Plantago lanceolata*	Ribwort plantain
Brachypodium sylvaticum	False brome	*Potentilla anserina*	Silverweed
Buddleja davidii	Butterfly bush	*Potentilla reptans*	Creeping cinquefoil
Centaurea nigra	Common knapweed	*Primula veris*	Cowslip
Cerastium fontanum	Mouse-ear chickweed	*Primula vulgaris*	Primrose
Cirsium arvense	Creeping thistle	*Prunus laurocerasus*	Cherry laurel
Corylus avellana	Hazel	*Quercus robur*	Pedunculate oak
Cotoneaster horizontalis	Wall cotoneaster	*Ranunculus acris*	Meadow buttercup
Crataegus monogyna	Hawthorn	*Ranunculus repens*	Creeping buttercup
Dactylis glomerata	Cock's foot	*Ribes sanguineum*	Flowering currant
Dipsacus fullonum	Wild teasel	*Rosa rugosa*	Japanese rose
Elymus repens	Common couch	*Rubus fruticosus agg*	Brambles
Epilobium angustifolium	Rosebay willowherb	*Rumex acetosa*	Common sorrel
Festuca rubra	Red fescue	*Rumex crispus*	Curled dock
Ficaria verna	Lesser celandine	*Salix cinerea*	Grey willow
Filipendula ulmaria	Meadowsweet	*Sambucus nigra*	Elder
Geranium molle	Dove's fot cranesbill	*Sinapis arvensis*	Charlock
Glechoma hederacea	Ground ivy	*Symphoricarpos albus*	Snowberry
Glyceria fluitans	Floating sweet-grass	*Taraxacum officinale*	Dandelion
Hedera helix	Ivy	*Trifolium repens*	White clover
Heracleum sphondylium	Hogweed	*Tussilago farfara*	Colt's foot
Holcus lanatus	Yorkshire fog	*Ulex europaeus*	Common gorse
Hyacinthoides non-scripta	Bluebell	*Urtica dioica*	Stinging nettle
Juncus inflexus	Hard rush	*Veronica persica*	Common field speedwell
Ligustrum ovalifolium	Privet	*Vicia sepium*	Bush vetch
Lotus corniculatus	Birdsfoot trefoil		

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