Planning & Development Act, 2000 - 2020,
European Communities (Environmental Impact Assessment) Regulations 1989 (as amended), Planning & Development Regulations, 2001 (as amended)

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

EdgeConneX Ireland Ltd.
Data Centre (DUB05)
Ballymakaily

February 2021

MARSTON
PLANNING CONSULTANCY

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1. INTRODUCTION

1.1 This Environmental Impact Assessment Report (EIA Report) has been prepared on behalf of EdgeConneX Ireland Ltd. to accompany an application to South Dublin County Council (SDCC) for a new data centre facility on lands to the immediate west of the recently realigned R120, Lucan, Co. Dublin.

1.2 The Proposed Development is to be located on a site of c. 22.1ha. and forms the same site as the permitted data centre development granted by An Bord Pleanála under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948.

1.3 The new data centre facilities will be located to the south-east of the 22.1hecatre site and are proposed to be developed in a phased basis. The new data centre is located to the west of the R120, and to the south of the Grand Canal. The location of the development is shown on Figure 1.1 below. For the purposes of clarity all lands within the application boundary is under the ownership and control of the applicant.

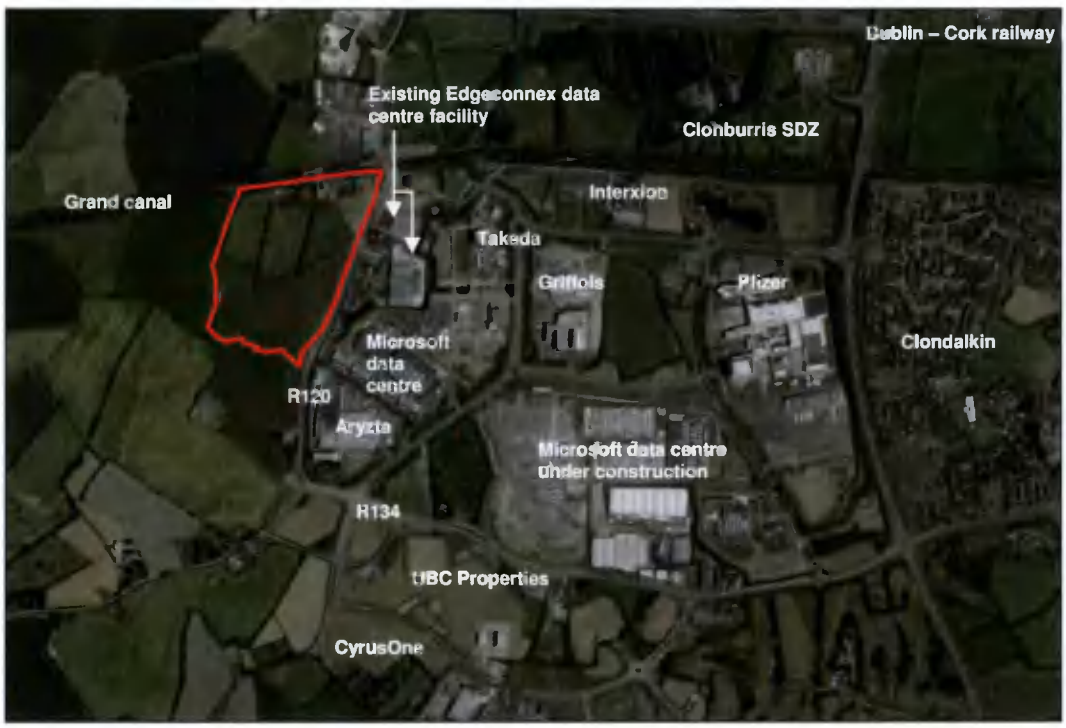

Figure 1.1 Site location map

1.4 The lands are to the west of the Grange Castle Business Park, and to the north of the business park to be known as Grange Castle West that are aimed at attracting overseas investment to the area. Located to the west of Clondalkin, the Grange Castle area has been the focus of significant international investment over the last several years.

1.5 The subject site is approximately 5km west of the M50 Orbital Motorway, and is close to the strategic road and mainline rail connections to the west and south of Ireland. The site is within 15 kilometres of the city centre and enjoys easy access to Dublin Airport and Dublin Port.

1.6 This EIA Report is prepared in respect of the two no. single storey data centres with associated office and service areas; and three no. gas powered generation plant buildings with an overall gross floor area of 24,487sqm. The associated structures include water tower and pump house and utility connections to the boundary of the site. The EIA Report has also cumulatively assessed with these works the permitted development on the site granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948 as well as the permitted development on the wider Edgeconnex site to the east of the R120.

1.7 In the case of the associated grid connection works to the permitted substation they will be subject to a separate Strategic Infrastructure Development (SID) application and EIA Report if the Board deem the works to be SID. The applicant has responded in this EIA Report to the aspects of the environment as well as specific issues raised in consultation with the Planning Authority.

Nature and extent of Proposed Development

1.8 The proposal is to seek permission for a period of five years to complete a development with a gross floor area of 24,624sqm. The development will consist of the construction of two no. single storey data centres with associated office and service areas; and three no. gas powered generation plant buildings with an overall gross floor area of 24,624sqm that will comprise of the following:

- Demolition of abandoned single storey dwelling, remaining agricultural shed and derelict former farm building;
- Construction of 2 no. single storey data centres (12,797sqm), both with associated plant at roof level; with 24 no. standby diesel generators with associated flues (each 25m high) that will be attached to a single storey goods receiving area / store and single storey office area (2,404sqm) located to the west of the data centres as well as associated water tower and sprinkler tank and other services;
- amendments to the internal access road and omission of access to loading bay permitted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948 that include the relocation of permitted, and new, internal security gates; and new internal access roads to serve the Proposed Development that will provide access to 39 no. new car parking spaces (including 4 no. electric and 2 no. disabled spaces) and sheltered bicycle parking to serve the new data centres;
- The development will also include the phased development of 3 no. two storey gas powered generation plants (9,286sqm) within three individual buildings and ancillary development to provide power to facilitate the development of the overall site to be located within the south-west part of the overall site. Gas Plant 1 (3,045sqm) will contain 20 no. generator units (18+2) with associated flues (each 25m high) will facilitate, once operational the decommissioning of the temporary Gas Powered Generation Plant within its open compound as granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948. Gas Plant 2 (3,045sqm) will contain 20 no. generator units (18+2) with associated flues (each 25m high); and Gas Plant 3 (3,196sqm) will contain 21 no. generator units (19+2) with associated flues (each 25m high). These Plants will be built to provide power to each data centre, if and, when required. The Gas Plants will be required as back-up power generation once the permanent power connection via the permitted substation is achieved;
- New attenuation pond to the north of the site;
- Green walls are proposed to the southern elevation of each Power plant, as well as to the northern elevation of the generator compound of the data centres, and enclosing the water tower/pump room compound; and a new hedgerow is proposed linking the east and west of the site; and
- Proposed Above Ground Gas Installation compound to contain single storey kiosk (93sqm) and boiler room (44sqm).

1.9 The development will also include ancillary site works, connections to existing infrastructural services as well as fencing and signage. The development will include minor modifications to the permitted landscaping to the west of the site as granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948. The site will remain enclosed by landscaping to all boundaries. The development will be accessed off the R120 via the permitted access granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948.

1.10 A full description and details of the Proposed Development is provided in Chapter 2 (Description of the Proposed Development).

1.11 It is proposed to provide permanent power supply to the site via the permitted GIS substation located centrally within the site and as granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948. Its HV connection to a suitable point of connection is yet to be defined by Eirgrid will be applied for, if deemed to be a SID form of development, under a separate Strategic Infrastructure Development (SID) application accompanied by an EIA Report.

1.12 The interim power supply is required to be provided by the proposed Power Plants that form part of this application, and will be developed in a phased basis, to provide permanent power for the data centre granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948; the data centres

that form part of this application; and a future phase. They are required as a result of the limited existing capacity within the National Grid available currently in the Greater Dublin area. Power Plant 3 will only be built if required to provide power to a future data centre on the site, if permanent power supply to the site has not been achieved. The Council are requested that a suitable condition be attached to the permission that addresses the potential that Power Plant 3 is not built. Full details of this, and its phasing, are set out in Chapter 2 of this EIA Report.

1.13 Due to the Flexible Demand offer from Eirgrid for the site; the Power Plants will be required to provide additional reliability of power, and will act as a back-up source of power when the connection to the national grid is unavailable. This is likely to be for relatively short periods but longer than could be sustained by the standby generators associated with all data centres on site.

1.14 It is proposed to create a campus level of finish to the overall site as opposed to an industrial form of development with heavy landscaping throughout and on all boundaries and particularly to the north bounding the canal as permitted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948. A large new attenuation pond to the north of the site will address the attenuation of the Proposed Development.

1.15 Over the past 10 years, a wide variety of service providers have begun offering IT infrastructure services to businesses in the form of web services - now commonly known as "cloud computing". Cloud computing is a network of remote servers hosted on the Internet and used to store, manage, and process data in place of local servers or personal computers. One of the key benefits of cloud computing is the opportunity to replace up-front capital infrastructure expenses with low variable costs that scale with each business's requirement. With the Cloud, businesses no longer need to plan for and procure servers and other IT infrastructure weeks or months in advance. Instead, they can instantly access hundreds or thousands of servers in minutes and deliver results faster.

Purpose of the Environmental Impact Assessment Report

1.16 The EIA Report sets out a description of the Proposed Development, an outline of the main alternatives studied by the developer (and an indication of the main reasons for this choice); a description of aspects of the environment which could be potentially affected by the Proposed Development; a description of the potential effects of the Proposed Development on the environment; a description of the forecasting methods used to assess the potential effects on the environment referred to above; a description of the measures envisaged to prevent, reduce and offset any potential adverse effects on the environment; and residual impacts. A non-technical summary of this information is provided in Chapter 2 of this EIA Report.

1.17 The potential impacts of the operation and construction phases of the Proposed Development have been assessed and summarised under the following environmental topics:

- Population and human health;
- Biodiversity;
- Land, soils, geology and hydrogeology;
- Hydrology;
- Noise and vibration;
- Air quality and Climate;
- Landscape and visual impact;
- Traffic and Transportation;
- Cultural heritage;
- Waste management;
- Material assets;
- Direct and indirect effects; and
- Interactions.

1.18 Mitigation measures have been integrated into the project with a preference given to measures that avoid potential environmental effects over measures that reduce and remedy potential environmental effects. Assessments were carried out on the basis of available access and information, i.e. on the basis of conditions that could be reasonably viewed or inferred from aerial photography, published reports and direct observation during site visits.

Requirement for this Environmental Impact Assessment Report

1.19 The requirement for EIA for certain types and scales of development is set out in the EIA Directives (2011/92/EU and 2014/52/EU), European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (the bulk of which came into operation in September 2018), the European Communities (Environmental Impact Assessment) Regulations 1989-2006, Planning and Development Act 2000 (as amended) and the Planning and Development Regulations 2001-2019. It should be noted that this EIA Report is prepared in accordance with the 2011 EIA Directive (2011/92/EU), as amended by the 2014 EIA Directive.

1.20 The EIA Directives list those projects for which an EIA is mandatory (Annex I) and those projects for which an EIA may be required (Annex II). With regard to Annex II projects, Member States can choose to apply thresholds or use case by case examination or a combination of both to assess where EIA is required. In Ireland, a combination of both has been applied.

1.21 The project proposed is not listed under Annex I EIA Directives but it is above the relevant threshold as set out in the Planning and Development Regulations 2001-2020 for Annex II projects. Industrial estate development projects, such as this, where the area would exceed 10 hectares, as set out in Part 2 of Schedule 5 of the Regulations, was considered to be most relevant threshold in the context of the Proposed Development. The Proposed Development site area exceeds this threshold and therefore an EIA Report is required for the Proposed Development.

1.22 The main objective of an EIA, as set out in Article 3(1) of the 2014 EIA Directive, is to identify, describe and assess the direct and indirect significant impacts of a project on population and human health, biodiversity, land, soils, water, air & climate (including noise), material assets, cultural heritage and the landscape and the interaction between the aforementioned factors. The EIA Report reports on the findings of the EIA process and informs the Planning Authority, statutory consultees, other interested parties and the public in general about the likely effects of the project on the environment.

Format of the Environmental Impact Assessment Report

1.23 This Environmental Impact Assessment Report (EIA Report) has been prepared in accordance with the requirements of the following:

- EU Directive /337/EEC; 2011/92/EU and 2014/52/EU;
- Planning and Development Act 2000 (as amended);
- Planning and Development Regulations 2001 (as amended);
- *Guidelines on the Information to be Contained in Environmental Impact Statements* 2002 (Environmental Protection Agency);
- *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements* 2003 (Environmental Protection Agency);
- *Revised Guidelines on the Information to be Contained in Environmental Impact Statements* Draft September 2017 (Environmental Protection Agency);
- *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements* Draft September 2015 (Environmental Protection Agency).

1.24 It is prepared in the Grouped Format Structure following the guideline structure set down in the Environmental Protection Agency (EPA) Draft "*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports" (*2017). The "*Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment"* (August 2018) and the European Commission *Guidance on the preparation of the Environmental Impact Assessment Report* have been considered in the preparation of the EIA Report.

1.25 Using the Grouped Format Structure, the EIA Report examines each environmental aspect in a separate chapter. Each chapter generally covers the following:

- Receiving Environment;
- Characteristics of the Proposed Development;
- Potential Impacts of the Proposed Development;
- Do-Nothing Scenario;
- Remedial and Mitigation Measures;

- Predicted Impacts of the Development; and
- Residual Impacts.

1.26 A Schedule of Mitigation measures to be implemented as part of the Proposed Development is included in Appendix 2.2. Cumulative effects for each environmental topic are assessed within each Chapter of this EIA Report. Interactions i.e. the interrelationship between each environmental aspect, are assessed as they occur in each chapter. Chapter 16 shows where interactions have been identified and how they have been addressed.

Need for the development

1.27 The Applicant has a number of existing data centres within this part of the Grange Castle area that includes a large and developing campus to the east of the Proposed Development site and to the east of the R120. The extent of the Operators Irish facilities have increased in recent years to cater for the growing demand for online services across the globe and it is expected that this will continue to grow in the coming years.

Company background

1.28 The applicant are a lead provider of cloud and carrier-neutral colocation data centre services in Europe and the USA. Since late 2013, they have built data centres across the US and are currently expanding its network across Europe enabling their customers to securely deliver mission-critical applications and content to end consumers, with excellent response time performance. Their existing state-of-the-art data centres provide space, power and cooling with reliability and performance that goes beyond industry standards. The Applicant is committed to running its business in the most environmentally friendly way possible. Please refer to Chapter 2 (Characteristics of the Proposed Development) for additional details.

Consultation

1.29 Marston Planning Consultancy (MPC), the applicant and the project team have liaised with the relevant departments of South Dublin County Council (SDCC) in advance of lodgement of this application. An initial meeting was held with SDCC on the 9th of February 2021 with representatives of the Planning, and Roads/Transportation, Parks, Sanitary Services and Heritage Departments. The key aspects addressed during scoping included:

- The nature, location and scale of the Proposed Development;
- The existing environment, including any vulnerable or sensitive site features or uses;
- The likely and significant impacts of the proposal on the environment, and particularly in relation to visual impact, noise and air quality; and
- The likely concerns of local residents, land users and other interested parties.

1.30 In addition, the relevant environmental specialists have liaised directly and independently with statutory bodies (including the Water Services and Parks departments of SDCC, Irish Water, Eirgrid, ESB, NPWS, and the Department of Defence etc.) by correspondence during the course of the EIA Report preparation. Other consultees are referred to in individual chapters. All EIA contributors/authors have incorporated advice and comments received from consultees into the relevant chapters of this EIA Report.

Regulatory control

1.31 The proposed data centre facility activity is not an EPA regulated activity in terms of the Industrial Emissions Directive 2010/75/EU (which replaced the IPPC directive). In accordance with the recent legislation relating to the Medium Combustion Directive (EU 2015/2193), the generators will be registered as required with the EPA. However, the diesel generators of the data centres are exempt from complying with the emission limit values set out in the Directive, as they will not operate for more than 500 hours per annum. The Power Plant facility and its gas based generators will require an EPA Greenhouse Gas (GHG) Emissions permit in accordance with the Environmental Protection Agency Act 1992, as amended. This will be applied for by the Applicant in due course prior to commencement of the scheduled activity.

Description of effects

1.32 The quality, magnitude and duration of potential effects are defined in accordance with the criteria provided in the EPA Draft *'Guidelines on the information to be contained in Environmental Impact Assessment Reports'* (2017) as outlined in Table 1.1.

Table 1.1 Description of Effects as per EPA Guidelines (Draft, 2017)

Effect Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment
Neutral	A change which does not affect the quality of the environment	
Negative	A change which reduces the quality of the environment	
Significance	Imperceptible	An impact capable of measurement but without noticeable consequences
Not significant	An effect which causes noticeable changes in the character of the environment but without noticeable consequences	
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities	
Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging trends	
Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment	
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.	
Profound	An impact which obliterates sensitive characteristics	
Duration of Effects	Momentary Effects	Effects lasting from seconds to minutes
Brief Effects	Effects lasting less than a day	
Temporary Effects	Effects lasting less than a year	
Short-term Effects	Effects lasting one to seven years.	
Medium-term Effects	Effects lasting seven to fifteen years	
Long-term Effects	Effects lasting fifteen to sixty years	
Permanent Effects	Effects lasting over sixty years	
Reversible Effects	Effects that can be undone, for example through remediation or restoration	
Probability of Effects	Likely Effects	The effects that can reasonably be expected to occur as a result of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.	
Type of Effects	Indirect Effects	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
Cumulative	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.	
'Do Nothing'	The environment as it would be in the future should no development of any kind be carried out	
'Worst case' Effects	The effects arising from a project in the case where mitigation measures substantially fail	
Indeterminable	When the full consequences of a change in the environment cannot be described	
Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost	
Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect	
Synergistic	Where the resultant impact is of greater significance than the sum of its constituents	

Additional assessments required

1.33 This section addresses the additional approvals and assessments required under other EU Directives and legislation.

Appropriate Assessment Screening Report

1.34 A screening report has been completed for the Proposed Development, as required under the Habitats and Birds Directive (92/43/EEC and 79/409/EEC) and is included as a stand-alone report undertaken by Scott Cawley, Consulting Ecologists. This document forms part of the application. The AA screening process has identified that the potential impacts associated with the Proposed Development do not have the potential to affect the receiving environment and, consequently, do not have the potential to affect the conservation objectives supporting the qualifying interest/special conservation interests of any European sites. Therefore, the Proposed Development is not likely to have significant effects on any European sites.

1.35 As the Proposed Development itself will not have any effects on the QIs/SCIs or conservation objectives of any European sites and taking into account the policies and objectives of the statutory plans referred to above, it is concluded that there is no potential for any other plan or project to act in combination with it to result in significant effects on any European sites. In assessing the potential for the Proposed Development to result in a significant effect on any European sites, any measures intended to avoid or reduce the harmful effects of the project on European sites are not taken into account.

1.36 Following an examination, analysis and evaluation of the relevant information, including in particular, the nature of the project and its potential relationship with European sites and their conservation objectives, as well as considering other plans and projects, and applying the precautionary principle, it is the professional opinion of the authors of the report that there is no potential for likely significant effects on any European sites.

Flood Risk Assessment

1.37 A Stage 1 Flood Risk Assessment has been undertaken for the site and forms a stand-alone report that forms part of this application.

Forecasting methods and difficulties in compiling the specified information

1.38 Forecasting methods and evidence used to identify and assess the significant effects on the environment for each environmental aspect are set out in each chapter. There were no significant difficulties in compiling the specified information for this EIA Report. Any issues encountered during the assessment of individual factors are noted within the relevant chapters.

Contributors to the EIA Report

1.39 The preparation and co-ordination of this EIA Report has been completed by Marston Planning Consultancy in conjunction with specialist subcontractors. Specialist inputs were provided by the following (Table 1.2):

Table 1.2 Roles and responsibilities in the EIA Report

Role		**Company**
EIA Project Management		Marston Planning Consultancy (MPC) – Anthony Marston
Architectural Design		Henry J Lyons – Jason Murphy
Engineering Design		Pinnacle Consulting
EIA Chapter no.	**Chapter title**	**Company and consultant**
	Non-technical summary	MPC – input from each specialist
Chapter 1	Introduction	MPC – Anthony Marston
Chapter 2	Description of the Proposed Development	MPC – Anthony Marston
Chapter 3	Planning and Development context	MPC – Anthony Marston
Chapter 4	Consideration of Alternatives	MPC – Anthony Marston
Chapter 5	Population and Human Health	MPC – Anthony Marston
Chapter 6	Biodiversity	Scott Cawley – Alexis Fitzgerald and others
Chapter 7	Land, Soil, Geology and Hydrogeology	AWN Consulting – Marcello Allende
Chapter 8	Hydrology	AWN Consulting - Marcello Allende
Chapter 9	Noise and Vibration	AWN Consulting – Damian Kelly
Chapter 10	Air Quality and Climate	AWN Consulting – Dr. Edward Porter
Chapter 11	Landscape and Visual Impact	Kevin Fitzpatrick, Landscape Architecture – Kevin Fitzpatrick
Chapter 12	Traffic and transportation	Pinnacle Consulting – Ronan Kearns
Chapter 13	Cultural heritage	CRDS – Stephen Mandal
Chapter 14	Waste Management	AWN – Jonathan Gauntlett
Chapter 15	Material Assets	MPC – Anthony Marston
Chapter 16	Cumulative effects	MPC – input from each specialist
Chapter 17	Interactions	MPC – input from each specialist

Project Director / Selected Chapters - *Anthony Marston, MSc (Environmental Planning).* Anthony is a corporate member of both the Royal Town Planning Institute and the Irish Planning Institute. Anthony is the Principal of Marston Planning Consultancy with over 25 years' experience in EIA Management; and planning and development consultancy. He has project managed, co-ordinated, provided specialist input and contributed to numerous EIA Reports.

Biodiversity – *Alexis Fitzgerald. Alexis is a Consultant Ecologist with Scott Cawley.* Alexis holds an honours degree in Natural Sciences, with a specialisation in Botany, from Trinity College Dublin and obtained a distinction in his Masters in Biodiversity and Conservation from the same institution. He is an expert at vascular plant, charophyte and bryophyte identification and habitat surveying, developed over more than seven years of intensive study in university, professional ecological surveying and with natural history groups such as the Botanical Society of Britain and Ireland (BSBI) and the Dublin Naturalists' Field Club (DNFC). He also has extensive professional experience with vegetation and habitat classification and mapping (including EU Habitats Directive and Fossitt classification and statistical vegetation analysis), as well as rare, protected and invasive plant species surveying and monitoring. He has conducted multiple ecological surveys and assessments (Preliminary Ecological Appraisal, Ecological Impact Assessment, Appropriate Assessment, etc.) of linear infrastructure, residential, commercial and industrial projects. In a voluntary capacity, he is actively involved with such botanical and natural history groups as the BSBI and the DNFC, organising

and leading field outings and indoor teaching seminars. He has also been the BSBI County Recorder for Co. Monaghan since 2015.

Niamh Burke is Director of Coiscéim Ecology. She holds a BSc in Natural Sciences with Environmental Science and a PhD in salmonid ecology. She is a Chartered Environmentalist (CEnv) with the Society for the Environment (Soc Env) and a Full Member of the CIEEM. Niamh is a senior scientist with academic research and consulting experience in terrestrial ecology, aquatic ecology and fluvial geomorphology. She is an experienced project manager with a full working knowledge of EIA, the planning process and relevant environmental legislation, both national and European. With a specialism in aquatic habitats, she also has experience of terrestrial species' surveys and mitigation approaches. In her extensive consultancy roles she has acted as reviewer for all ecological reporting, ensuring consistency of standards and approach.

Ashling Cronin is a Technical Director with Scott Cawley Ltd. She holds a Masters in Ecological Assessment, an honours degree in Applied Ecology from University College Cork and an Advanced Diploma in Planning and Environmental Law in Kings Inns. She has over eleven years' experience in environmental management and environmental and ecological assessment across both the private and public sector. Ashling has a keen interest in both national and international environmental legislation and has extensive experience in the Appropriate Assessment (AA) process. She has been the lead ecologist for the preparation of a number of Natura Impact Statements for a range of development types and national level plans, as well Natura Impact Reports for a range of land use and non-land use plans. Ashling also provides technical review and due diligence of Appropriate Assessment documentation for public and local authorities to aid their decision-making process as well as peer review of AA documentation prior to lodgement of planning applications.

Land, Soils, Geology, Hydrogeology, and Hydrology- *Marcello Allende*. Marcelo Allende is an Environmental Consultant at AWN with over 15 years of experience in Environmental Consulting and water resources. Marcelo holds a degree in Water Resource Civil Engineering from the University of Chile. He has worked on a wide of range of projects including multi-aspect environmental investigations, groundwater resource management, hydrological and hydrogeological conceptual and numerical modelling, Due Diligence reporting, surface and groundwater monitoring and field sampling programmes on a variety of brownfield and greenfield sites throughout Ireland as well as overseas in Chile, Argentina, Peru and Panama.

Noise and Vibration - *Damian Kelly, Director and Principal Acoustic Consultant in AWN.* He holds a BSc from DCU and an MSc from Queens University Belfast. He has over 18 years' experience as an acoustic consultant. He is a member of the Institute of Acoustics. He has extensive knowledge in the field of noise modelling and prediction, having prepared the largest and most complex examples of road and industrial noise models currently in existence in Ireland. He was also co-author of the EPA document "Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities" (2012) and advised in relation to the noise limits applied to commercial developments by the various local authorities in the Dublin region.

Air Quality & Climate – *Dr. Edward Porter.* Dr. Edward Porter is Director with responsibility for Air Quality with AWN Consulting. He holds a BSc from the University of Sussex (Chemistry), has completed a PhD in Environmental Chemistry (Air Quality) in UCD where he graduated in 1997 and is a Full Member of the Royal Society of Chemistry (MRSC CChem), the Institute of Environmental Sciences (MIEnvSc) and the Institute of Air Quality Management (MIAQM). He specialises in the fields of air quality, EIA and air dispersion modelling.

Landscape and Visual Impact - *Kevin Fitzpatrick, BA(Hons) Land Arch, MLA, MILI.* Kevin is a corporate member of the Irish Landscape Institute. Kevin is the Principal of Kevin Fitzpatrick Landscape Architecture with over 15 years' experience in landscape and visual Impact assessment for inclusion in EIAR. He has provided visual assessment and specialist landscape analysis and design input to numerous EIA Reports.

Traffic and Transportation – *Ronan Kearns.* Ronan is an Associate Transportation Planner with a Masters in Civil Engineering with 17 years of experience in the traffic and transportation field. He has been involved in a variety of projects involving transport planning, Modelling, Traffic and Transport assessments, sustainable mobility planning, and engineering design.

Cultural heritage – *Dr. Stephen Mandal.* Dr Stephen Mandal MIAI PGeo EurGeol is co-founder (in 1997) and managing director of CRDS Ltd. Stephen holds an honours science degree in Geology and a PhD in Geoarchaeology on the petrology of the Irish stone axe from (TCD). He also holds Certificates

in Safety and Health and Occupational First Aid (UCD). On completion of his PhD, Stephen spent two years as a post-doctoral research fellow in the Archaeology Department, UCD, during which time he also undertook a three-month research fellowship in Cineca, Bologna, Italy. Since 1991 Stephen has been petrologist for the Irish Stone Axe Project. He is professional member of the Institute of Archaeologists of Ireland, the Institute of Geologists of Ireland, and the European Federation of Professional Geologists. Between 2009 and 2014 Stephen Vice Chairperson of the Archaeology Committee of the Royal Irish Academy Committee.

Waste Chapter - ***Jonathan Gauntlett***. Jonathan is an Environmental Consultant in AWN Consulting with ongoing roles in impact assessment, licensing, environmental compliance and project management. Jonathan has over 9 years' experience in environmental compliance, environmental licensing, and urban planning. Recent projects include; SID and planning applications, IE Licence applications for biopharma and ICT facilities. Jonathan has a BSocSc (Environmental Planning) and BBA (Economics) from the Waikato University in New Zealand and has experience working in environmental consultancy, planning, and regulatory fields in Ireland, the UK and New Zealand.

2. DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 As described in Chapter 1 (Introduction), the Applicant is applying to SDCC for 2 no. single storey data centres, and three no. Power Plants, and associated ancillary development on a site of 22.1hectares.

2.2 The following chapter presents a description of the Proposed Development, as defined below, as required by the relevant planning legislation, 2011 EIA Directive (2011/92/EU), as amended by the 2014 EIA Directive (2014/52/EU) (herein referred to as the EIA Directive) and the current Draft EPA "*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*" (2017) (herein referred to the as the EPA Draft EIA Report Guidelines 2017) and with reference to the EPA Draft "*Advice Notes for Preparing Environmental Impact Statements*" (2015).

Characteristics of the site

2.3 The Proposed Development is to be located on a site of c. 22.1hectares to the immediate west of the recently realigned R120 within the townland of Ballymakaily, Lucan, Dublin 22. The site in terms of its current use can be split into two areas with the majority of the land forming open grassland; and a former farmhouse and associated former agricultural buildings forming a small part of the northern part of the site to the immediate south of the Grand Canal.

2.4 The majority of the site that remains in grassland contains field boundaries in the form of hedgerow and small trees along its southern and western boundary that forms the townland boundary between Ballymakaily and Gollierstown to the west and Grange to the south. The site also contains five enclosed fields to the north-east and a larger L-shaped field that extends from the realigned road at the south-east to the canal to the north-west. An agricultural access road leads from the realigned R120 to the north-east of the overall site to the former agricultural buildings.

Figure 2.1 Aerial view of application site (refer to architectural drawings of Existing Site Plan and all buildings to be demolished that accompany the application for greater detail)

2.5 The eastern boundary of the site has been subject to a compulsory purchase order by South Dublin County Council to facilitate the Adamstown / Newcastle Road improvement scheme. This has resulted in a significant length of hedgerow being removed by the Council to facilitate the road works for some 430m of the eastern boundary with lengths of hedgerows remaining of 100m to the south-east, and 130m to the north-east along the realigned road. The former road remains in situ at the south-east corner of the site.

2.6 The site is bounded by the Grand Canal, and a lane along part of its south side and planting, to the north. A dormer type property and both the original and new bridge over the Grand Canal lie to the north-eastern corner and outisde the site. The realigned R120 bounds the site to the east with a

number of residential properties bounding the road to its east. The data centre campus of the applicant granted and implemented that allows for future expansion under Ref. SD16A/0214, SD16A/0345 and SD17A/0141/SD17A/0392 as well as SD18A/0298 is located to the rear of these residential properties to the east of the R120. The site is bounded by further agricultural land zoned for development to the south and west. A traveller site is located some 180m to the south-west of the site.

2.7 A large electricity pylon is situated in the northern portion of the site to the immediate south of the derelict farm buildings and in the north-west corner of the site. The power cables run across the site on a west-north-west to east-south-east axis across the site. The eastern part of the site has been subject to a compulsory purchase order by South Dublin County Council to facilitate the R120 improvement scheme, which is nearing completion. This resulted in a temporary land take of some lands that has reverted back into the ownership and control of the applicant following completion of the road scheme, and therefore is usable and forms part of the permitted mitigation landscape master plan for the overall development of the site.

2.8 The site is relatively flat though there is a slope towards the north-east corner. The site is currently accessed only via agricultural access points from the east off the R120 and from the north off the access road to the abandoned agricultural buildings.

2.9 The site is located between the N4 and N7 national primary roads and is served by an improving local road network including the regional roads R120 (which has been recently upgraded including a new bridge over the Grand Canal), R134 and R136 (The Grange Castle Road) and the road network through the Grange Castle Business Park.

Permitted development on the site

2.10 Permission was granted by An Bord Pleanála on the 5th October 2020 under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948 for the phased development of 4 single storey data halls all with associated plant at roof level, 32 standby generators, office and service areas, service road infrastructure, car parking, ESB substation/transformer yard.

2.11 An EIAR was submitted with the application with an overall gross floor area of 17,685sqm. The development also includes a temporary gas-powered generation plant within a walled yard containing 19 no. generator units with associated flues (each 17m high) to be located to the west of the proposed data halls.

2.12 The decision of the Board was subject to 19 conditions. Condition no. 16 relating to noise outlined that operational noise shall not exceed 45dB(A) Leq 1 hour between 2000 and 0800, and 55dB(A) Leq 1 hour at all other times. The condition in full stated:

> *"The operational noise level shall not exceed 55 dB(A) Leq 1 hour (corrected for any tonal or impulsive component) at the nearest noise sensitive locations, including dwellings, between 0800 and 2000 hours, Monday to Friday inclusive, and shall not exceed 45 dB(A) Leq 1 hour at any other time. All sound measurement shall be carried out in accordance with ISO 1996-1:2016 "Acoustics - Description, measurement and assessment of environmental noise - Part 1: Basic quantities and assessment procedures". Procedures for the purpose of determining compliance with this limit shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development."*

2.13 The recently permitted development has not commenced on site.

Proposed Development description

2.14 The Proposed Development is to develop two no. single storey data centres with associated office and service areas; and three no. gas powered generation plant buildings with an overall gross floor area of 24,487sqm. Figure 2.2 presents a site layout plan of the Proposed Development.

2.15 The Proposed Development with a gross floor area of 24,624sqm (as described and defined below) is to seek permission for a period of five years for a development that will consist of the following various works, as follows:

Figure 2.2 Proposed site layout plan

2.16 The development will consist of the construction of two no. single storey data centres with associated office and service areas: and three no. gas powered generation plant buildings with an overall gross floor area of 24,624sqm that will comprise of the following:

- Demolition of abandoned single storey dwelling, remaining agricultural shed and derelict former farm building;
- Construction of 2 no. single storey data centres (12,797sqm), both with associated plant at roof level; with 24 no. standby diesel generators with associated flues (each 25m high) that will be attached to a single storey goods receiving area / store and single storey office area (2,404sqm) located to the west of the data centres as well as associated water tower and sprinkler tank and other services;
- amendments to the internal access road and omission of access to loading bay permitted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948 that include the relocation of permitted, and new, internal security gates; and new internal access roads to serve the Proposed Development that will provide access to 39 no. new car parking spaces (including 4 no. electric and 2 no. disabled spaces) and sheltered bicycle parking to serve the new data centres;
- The development will also include the phased development of 3 no. two storey gas powered generation plants (9,286sqm) within three individual buildings and ancillary development to provide power to facilitate the development of the overall site to be located within the south-west part of the overall site. Gas Plant 1 (3.045sqm) will contain 20 no. generator units (18+2) with associated flues (each 25m high) will facilitate, once operational the decommissioning of the temporary Gas Powered Generation Plant within its open compound as granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948. Gas Plant 2 (3,045sqm) will contain 20 no. generator units (18+2) with associated flues (each 25m high); and Gas Plant 3 (3,196sqm) will contain 21 no. generator units (19+2) with associated flues (each 25m high). These Plants will be built to provide power to each data centre, if and, when required. The Gas Plants will be required as back-up power generation once the permanent power connection via the permitted substation is achieved;

- New attenuation pond to the north of the site;
- Green walls are proposed to the southern elevation of each Power plant, as well as to the northern elevation of the generator compound of the data centres, and enclosing the water tower/pump room compound; and a new hedgerow is proposed linking the east and west of the site; and
- Proposed Above Ground Gas Installation compound to contain single storey kiosk (93sqm) and boiler room (44sqm).

2.17 The development will also include ancillary site works, connections to existing infrastructural services as well as fencing and signage. The development will include minor modifications to the permitted landscaping to the west of the site as granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948. The site will remain enclosed by landscaping to all boundaries. The development will be accessed off the R120 via the permitted access granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948.

Proposed Data Centre Processes

2.18 A data centre facility is a centralised hub for the secure storage, management and distribution of information to individual businesses and organisations. With the levels of online activity increasing rapidly this facility will enable Edgeconnex to meet its clients growing demands. The proposed data centres offer clients the latest in power, cooling and connectivity with hardened security to control access to client information.

2.19 The data centre facilities when completed will house data halls which will allow Edgconnex's clients (individuals, businesses or organisations) store their information at a secure and reliable facility off their premises for minimal cost and complexity compared to the traditional forms of in-house data storage systems. The data centre facilities are typically constructed on a relatively large scale compared to other forms of data storage which results in significant benefits in terms of economies of scale.

2.20 The Data Centre facilities have:

- Higher reliability and built in redundancy systems;
- 24/7 monitoring and maintenance of the facility and its systems by staff;
- Lower network latency and higher bandwith at lower cost; and
- specialist network and facilities engineers typically not viably employed by individuals, businesses or organisations..

2.21 The data halls are cooled via roof mounted cooling units utilizing external ambient air to provide cooling to the data centre. As the external air passes through a heat exchanger cooling the air circulating from the data centre the potential for any external contaminants entering the space is limited. As evidenced by the numerous other data centres recently developed in Ireland, the temperate climate is ideally suited to data centres. The naturally cool ambient temperature means the data halls require less cooling than if the facilities were located in regions of the world subject to greater temperature and humidity variation. The proposed Data Centre facilities have an overall IT load of c. 30MW when completed.

Phasing of development

2.22 The construction of the Proposed Development will be phased as part of the development of the masterplan. As outlined on page 11 of this EIA Report the first data centre received a full grant of permission as did the temporary gas powered Aggreko Plant in October 2020. The Aggreko plant only has capacity to provide power to operate a small portion of the data centres granted permission under this recent decision.

2.23 Phase 1 of the Proposed Development will include the commencement of construction of development of the proposed data centres and the construction of the new Gas Plant 1, and the decommissioning of the temporary Aggreko Plant granted for a period of two years from the An Bord Pleanála decision in October 2020. These two plants will not operate at the same time. It is the intention that Gas Plant 1 will provide power to the permitted data centre that is located to the south-east of the overall site that was granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948. Construction of the

proposed data centre under this application is envisaged to take a period of c. 18 months between Q4 2021 and Q2 2023. Construction of Gas Plant 1 is envisaged to take a period of c. 6 months between Q4 2021 and Q2 2022.

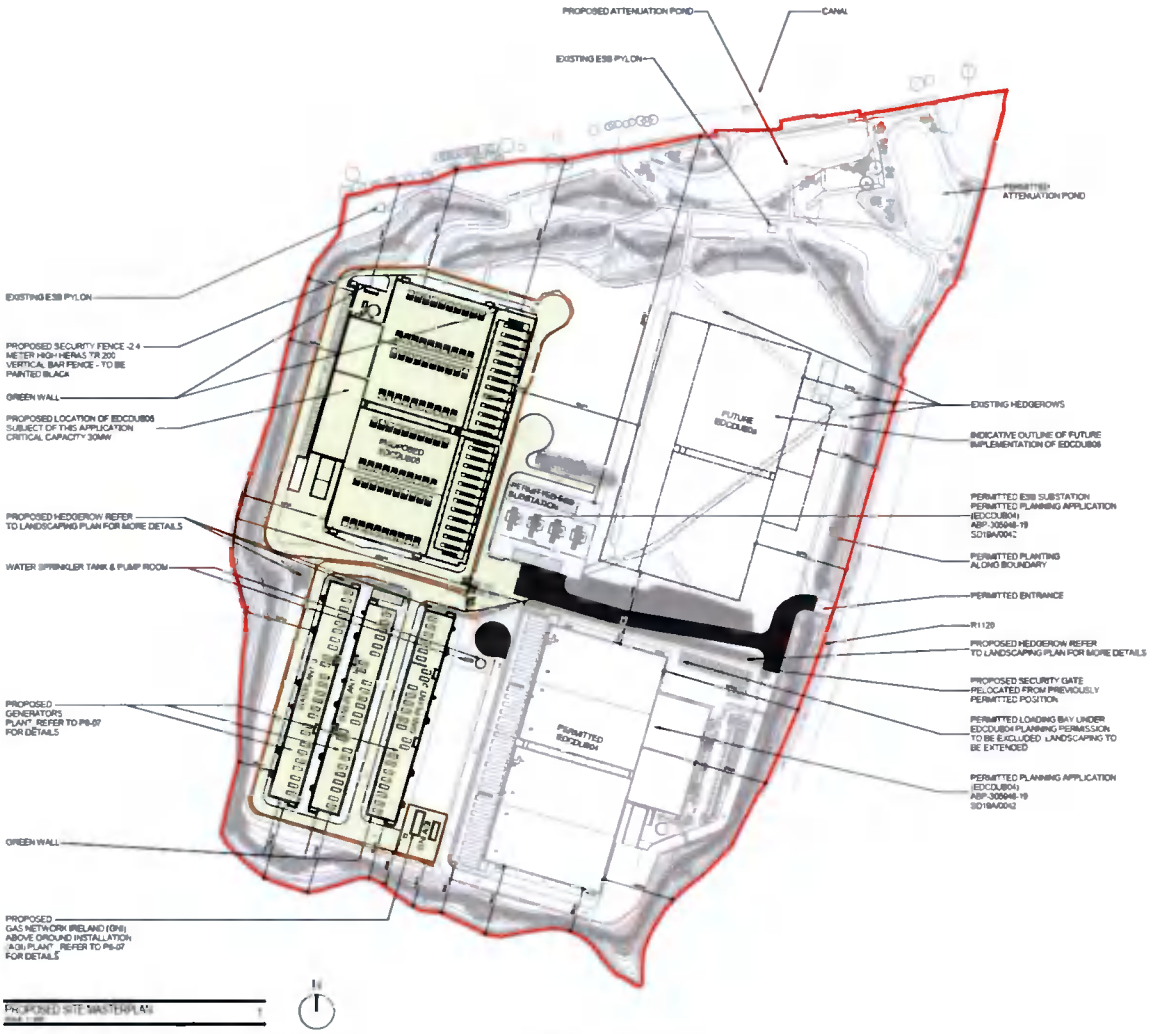

Figure 2.3 Proposed master plan for the overall development site

2.24 Phase 2 of the Proposed Development will include for the construction of the new Gas Plant 2 over a period of c. 6 months between Q3 2022and Q1 2023. Phase 3 of the Proposed Development, if required, will include for the construction of the new Gas Plant 3 over a period of c. 6 months between Q4 2024 and Q2 2025.

2.25 The timing of all development will be subject to commercial demand and it has been assumed for the purposes that it will extend to a c. 3.5 year period for the purposes of this EIAR. The masterplan for the overall site is shown in Figure 2.3 below.

2.26 A potential future phase of development on the site will be formed by a future planning application that will be accompanied by an EIA Report that will cumulatively assess the impact of all development on the site.

2.27 There is potential for both data centre developments (as permitted and now proposed) to be constructed over the same, or at least partly the same, time period. The cumulative impact of this on the construction phase has been assessed under this application.

2.28 It is proposed in the future to make a separate application for an 110kV connection from the permitted substation granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948 to a point to be determined by Eirgrid. This will form a Pre-Application Consultation to An Bord Pleanála for them to determine whether it would amount to Strategic Infrastructure Development (SID). The entire landscape master plan for the site is proposed to be in place within the first two years following the

commencement of construction of the already Permitted Development. The new attenuation pond proposed under the Proposed Development will

Description of Secondary Process/Activities

Administration element

2.29 The staff at the proposed data centre facilities will largely be housed in the administration portion located and adjoining its western elevation. The admin element of each building comprises the following main components:

- Reception Areas;
- General Office Areas for staff and management;
- Offices space for clients and project teams;
- Canteen & Sanitary Facilities; and
- Conference Rooms/Meeting Rooms.

Surface Water Drainage

2.30 In accordance with the requirements of South Dublin County Council and the Design Guidelines of the Regional Code of Practice for Drainage Works and the Greater Dublin Strategic Drainage Study any new development must adhere to the overall design requirements of these documents. The proposed drainage network has been designed to convey the captured storm water on site and to direct it to the proposed 1 no. new attenuation area (that has a capacity of 4,000m^3 to be located at the central northern boundary to the south of the Grand Canal. An additional 304m^3 of storage is provided within the pipe network within the site. A further attenuation pond permitted under the original permission on the site of a smaller capacity is located within the north-east corner of the site and has a capacity of 2,580m^3. The storm water system has been modelled to ensure no physical clashes with other utilities, notably the proposed foul system.

2.31 The drainage design requirements state that any development must restrict post development run-off rates to the pre-development, greenfield rates. The outflow from the Proposed Development, will be restricted by way of a Hydrobrake facility, which will limit the discharge to 9.60l/s, which is the calculated QBAR greenfield run-off rate This requires any new development to restrict storm water flows leaving the site to pre-developed rates. In practice, to accommodate this requirement, on-site storage must be provided to temporarily store rainwater generated on site. The proposed and permitted 2 no. attenuation areas have been sized to accommodate all storm water generated from runoff from building roofs, yards and the internal road network proposed under this application and other phases of the development. In total due to the size of the Proposed Development one larger attenuation area is being proposed under this application only are being proposed. The pond has been sized to accommodate the predicted storm water volumes generated during a 1-in-100 year storm event, increased by 20% for the predicted effects of climate change. Both attenuation ponds will drain to the east and outfall into an existing storm sewer to the east of the Proposed Development site.

2.32 A second design requirement for the storm water system is to comply with the general principles of sustainable urban drainage, this requires that storm water generated on site is passed through a treatment process to enhance its overall quality prior to discharge, and, where practical, to discharge this water into the groundwater table, to aid in the recharging of same. The proposed attenuation ponds will receive storm water which has passed through a suitably sized oil separator to ensure any hydrocarbon pollution is removed prior to storm water entering the attenuation zones.

2.33 Further details are provided within the *Engineering Planning Report*, prepared by Pinnacle, Consulting Engineers, and in Chapter 7 of this EIAR and associated appendices.

Foul Drainage

2.34 Domestic effluent arising from occupation of the data centre facilities will be collected in foul drains within the site that will connect to the foul sewers that run along the eastern side of the site alongside the R120 and discharged to the wider foul drainage network that ultimately discharges to Ringsend WWTP. The proposed foul network has been designed in accordance with the requirements of the Building Regulations, Part H and the Irish Waters Code of Practice for Wastewater Infrastructure.

2.35 Based on the nature and extent of the Proposed Development, the expected daily dry weather flow (DWF), for domestic effluent has been calculated as 6m³/day. The peak wastewater flow is 0.54l/s.

2.36 The overall wastewater discharge associated with the Proposed Development is in accordance with the peak discharge rates of 0.54l/s as outlined in the Irish Water PCE. Further detail in relation to waste water emissions is presented in the Pinnacle Consulting Engineers *Water Engineering Planning Report*. Further reference is made to the sewerage and waste water treatment system in Chapter 8 Hydrology.

Water Supply

2.37 Water is required for cleaning, general potable supply for drinking and sanitary facilities, in addition to fire-fighting requirements. This will be sourced from mains water supply from the previously granted 150 mm Ø network within the site as permitted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948. This is fed from the existing 400mm Ø trunk main located along the R120 to the east of the site.

2.38 The design requires a total peak water demand (for both domestic and process demand) of up to 0.43litres per second (l/s) and an average water demand of 0.086l/s. As noted in the previous section and in the Pinnacle Engineering Planning Report, a PCE was submitted to IW which addressed water demand for the development. The overall water demand associated with the Proposed Development is in accordance with the water demand outlined in the submitted PCE. Further detail in relation to water supply is presented in the Pinnacle Consulting Engineers, Engineering Planning Report, Chapter 8 Hydrology and Chapter 15 Material Assets.

Electricity

2.39 The Proposed Development includes the construction of 3 no. power plants that will be constructed in a phased basis to provide power, in the short-term, to the permitted development as granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948, the Proposed Development and a potential future development.

2.40 The permanent power supply to the overall development of the entire site will be provided via the permitted two storey 110kV GIS Substation with associated transformer compound that is located centrally within the Proposed Development site and to the east of the proposed data centre. This will be connected via an 110kV transmission line from a suitable connection / substation that is yet to be determined by Eirgrid. The application for the provision of the transmission lines, which do not form part of this application, may be determined as Strategic Infrastructure Development (SID) through the pre-application consultations with the Board. It is planned to construct the permitted GIS Substation during the later part of the construction phase of the Proposed Development. It is proposed to commence in Q2, 2022 and be completed in Q3, 2024. The GIS Substation and transmission line will be designed to support power demand for the full development of the Proposed Development of the site.

2.41 There is a requirement for the Power Plants to provide both a short-term and back-up power solution to the Proposed and Permitted Development. This is due to the Flexible Demand conditional Eirgrid offer that is in place for the site. This requires a back-up solution to the National Grid above that of the temporary diesel generators, once the Proposed Development is connected to the National Grid. This is due to the constrained nature of the National Grid within the Greater Dublin area. Flexible Demand is defined by Eirgrid as:

> *"Flexible demand is electrical load for a data centre that must be reduced on instruction from EirGrid via the National Control Centre (NCC). Where capacity availability in a particular area is constrained, EirGrid will reserve the right to apply flexible demand arrangements and this will be reflected as a requirement for connection offers for new data centres in that area. EirGrid identify constrained areas as areas where there is a risk or potential risk that the level of demand may be greater or has the potential to become greater than the level of supply currently available or that will be available in the coming years. Such risks are caused by the unavailability of electricity supply in a particular area to meet the demand requirements in the same area. At present, EirGrid has identified the greater Dublin region as constrained. Flexible demand is*

electrical load for a data centre that must be reduced on instruction from EirGrid via the National Control Centre (NCC). Where capacity availability in a particular area is constrained, EirGrid will reserve the right to apply flexible demand arrangements and this will be reflected as a requirement for connection offers for new data centres in that area. EirGrid identify constrained areas as areas where there is a risk or potential risk that the level of demand may be greater or has the potential to become greater than the level of supply currently available or that will be available in the coming years. Such risks are caused by the unavailability of electricity supply in a particular area to meet the demand requirements in the same area. At present, EirGrid has identified the greater Dublin region as constrained."

2.42 Further details on the power supply for the Proposed Development are provided in Chapter 16 Material Assets. It should be noted that at all times two of the gas generators within each Power Plant will be idle and will act as back up to the other generators within each Power Plant. This generates an 18 + 2 arrangement within Power Plants 1 and 2; and a 19 + 2 arrangement within Power Plant 3.

Telecommunications

2.43 A fibre optic cable distribution network will be installed within the site for the entire Proposed Development and Permitted Development. The connection into the wider telecommunications network will be undertaken by a statutory telecommunications operator.

Generators and diesel storage

2.44 In the event of a loss of power supply i.e. temporary grid blackout, diesel powered back-up generators will be provided to maintain power supply. These generators are designed to automatically activate and provide power to the data centres pending restoration of mains power. (An uninterruptible power source is also provided for the short-term transition from mains power to diesel generators).

2.45 The data centres will be served by a total of 24 no. back-up diesel generators. Each generator will also include a diesel belly tank with a single refuelling area to serve the proposed emergency generators. It is anticipated, based on the Operator's experience, that back-up generators will rarely be used. They will be tested periodically to maintain operational readiness (See Chapter 10 – Air Quality and Climate for testing regime). The assessment of the impact of these emissions is presented in Chapter 10 - Air Quality and Climate. The Power Plant buildings will also include 2 no. diesel generators each. A diesel oil tank of 6 m^3 will be required for each generator (i.e., 6 no. tanks of 6 m^3 will be required). All tanks will be bunded.

Other infrastructure

2.46 The data centres will be served by a sprinkler water tanks and associated pump rooms.

Off-site traffic movements

2.47 There will be a small increase in traffic owing to staff movements to and from the Proposed Development once operational. This traffic will use the existing road network which has more than adequate capacity. Operational access will be from the R120 via the already permitted vehicular access into these lands as granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948. The wider area has excellent links to the National primary routes. Further details in relation to the potential impact of the Proposed Development in terms of traffic are presented in Chapter 12 Traffic and Transportation.

Security and lighting

2.48 All traffic intending on accessing the facility will approach and access the site through the permitted access road off the R120, and via the slightly realigned and new access road within the site. A maximum speed limit of 30km/hour will be in place on the internal access road.

2.49 A pair of security access gates were permitted under the 2019 application. These are proposed to be relocated, and with new internal security access gates to be provided for the Power Plant compound and the proposed data centre under this application. The need for different security access gates

relates to potential end users. The security gates will be controlled from inside the permitted data centre and maintained by security personnel 24/7. Security will ensure that the procedure for accessing the facility is followed at all times. A record will be maintained of all personnel visiting the site (including deliveries etc.). All visitors to site will be monitored and supervised at all times.

2.50 A 2.4m high security fence will be constructed around the perimeter of the proposed data centre and power plant. The planting around the site will obscure this from views from around the site. The security fence for the data centre passes to the outside of the access road that extends around the development parallel to the internal access around the ICT facilities and to the rear of the planting along the southern side; and adjacent to the internal access road that forms part of this application, to the north-west.

2.51 The Proposed Development will be well screened from the R120 by the permitted berms and planting. The intention is that boundary berms and planting will be significant as set out under the landscape master plan (refer to Chapter 11 Landscape and Visual Impact). CCTV cameras will be installed at strategic locations around the site to ensure all boundaries and approaches to the site are adequately monitored.

2.52 An Intruder Detection System (IDS) combined with CCTV and security lighting will be utilised. The lighting design (both security and environmental lighting) has been assessed and optimised for the site, to ensure no obtrusive glare, light spillage or other light nuisance on neighbouring residential receptors or business users.

2.53 Bat Conservation Ireland (www.batconservationireland.org) has produced a set of guidance notes for consideration in the design of bat sensitive lighting schemes. Further and more recent guidance has been provided by Bat Conservation Trust in the UK in relation to bats and artificial lighting. The main items to consider for both types of bat habitat are listed below.

Table 2.1 Lighting mitigation design for bats

Bat Roosts	Foraging & Commuting
No direct illumination at exist points	Avoid lighting along river, lakes and canals
Position lights to avoid sensitive areas	Avoid lighting along important commuting routes
Use low pressure or high pressure sodium lights	Avoid the use of mercury or metal halide lamps
Avoid the use of mercury or metal halide lamps	Minimise light spills using shields masking and louvres
Restrict lights and the timing of such to avoid bat activity	Keep lighting columns as low as possible
Restrict lighting to ensure there are dark areas	Restrict lighting to ensure there are dark areas

2.54 The design has been modelled to ensure the solution achieves the twin aims of having safe circulation routes external to the proposed facility but whilst not having a long term impact on foraging, commuting and bat roosts. The lighting model indicates that the illumination levels fall off to 0.5 lux within 2m of the roadways etc. (1 lux is accepted as being equivalent to a moon lit night). This is further detailed and assessed within Chapter 6 – Biodiversity.

Waste management

2.55 Chapter 14 contains a description of waste management relating to the Proposed Development. A detailed Operational Waste Management plan will be prepared in advance of the commencement of the activity at the site to ensure best practice is followed in the management of waste from the Proposed Development.

Description of process inputs and outputs

2.56 The primary inputs to the Proposed Development are power, water (mains) and diesel fuel (for emergency generators as and when required). The main outputs are waste air, water, waste and emissions from the generator stacks (when the generators are in operation).

Inputs

Power

2.57 The proposed data centre development will have a critical capacity of c. 30MW. This power will be provided by the National Grid in the medium term; but will require the use of power from the Gas Power Plants in the short-term to provide power adequate to facilitate the full utilization of the already

permitted development, as well as the proposed data centre under this application. The third Gas Plant has the capacity to provide a short-term power supply for a potential future data centre to the north-east of the site. These Power Plants will provide the back-up power in the medium term above that of the temporary generators attached to the data centres. This back-up power is required by EirGrid due to the Flexible Demand offer. This will only be required in the event of a grid event on the National Grid, that requires the power supply to the development to be temporarily suspended.

Emergency Back Up Fuel

2.58 In the event of a loss of power supply due to a local event and loss of power the emergency diesel generators are designed to automatically activate and provide power to the data centre facilities. The generators will be supplied by diesel. Each generator will be supplied from the 24 no. bunded diesel tanks serving the data centres.

Outputs

Air

2.59 One of the primary outputs from the facility will be excess air that is removed continually by motorised fans in the mechanical cooling system. This air is not technically coming out of the data centre buildings, but rather being drawn across the coils of the condensers located on the roof. Outside air will be used to pressurise the data halls and provide humidification control to the space. This air is not extracted from the building but leaks out via openings in doors to the surrounding spaces.

2.60 As part of the development of the project, the applicant considered the offload/reuse/exchange of waste heat with neighbouring industrial facilities or other potential users within the environs of the business park. However at the time of preparation of the EIAR no feasible outlet was appropriate. However, the facility has the capacity to retro-fitted for the future proofing of the building fabric and the safeguarding of pipe network routes up to site boundaries to facilitate future connection to district energy networks in the area.

Water and wastewater

2.61 The facility will generate waste water in terms of both storm water and foul water. Storm water i.e. rain water runoff will be collected in site storm water drainage from roofs and yards and discharged through the site attenuation system in compliance with SUDs (refer to Water Services Report).

2.62 The facility design includes interceptor systems to ensure the quality of storm water discharge prior to discharge. Further details are supplied in Chapter 7. Foul water will be generated from sanitary facilities and the cooling process and will be discharged to the public foul sewer. Domestic effluent from toilets, sinks, etc is estimated to be 0.54l/s.

Emissions from engine and boiler stacks

2.63 As outlined above it is anticipated that the diesel back-up generators will rarely be used however, they will be maintained for emergency readiness by being tested once a week individually i.e. each generator will be turned on four times per month for one hour to maintain operational readiness when required waste exhaust gases will be vented to air via the 25m stacks along the eastern edge of the building.

2.64 The Gas Power Plants will operate on a permanent basis until such time as the permanent power supply is provided, and intermittently as a back up to the National Grid, on the failure of, and a significant event on the National Grid. Waste exhaust gases will be vented to air via 25m high flues. An assessment of the impact of these emissions is presented in Chapter 10 Air Quality and Climate.

2.65 An Environmental protection Agency Industrial Emissions (IE) licence will be applied for the facility as required. The licence application principally relates to the operation of the Gas Powered Generation Plant. The classes and nature of the Industrial Emissions Directive activities applicable to this facility in accordance with the First Schedule to the Environmental Protection Agency Act 1992 as amended are: Class 2.1 Combustion of fuels in installations with a total rated thermal input of 50 MW or more.

Wastes

2.66 A small amount of domestic waste will be produced at the ICT facilities. A more detailed description is provided in Chapter 14 Waste Management and Chapter 15 Material Assets.

Existence of the project

2.67 Under the current Draft EPA Guidelines on the information to be contained in EIA Reports, the description of the existence of the project is required to define all aspects of the proposed lifecycle of the facility under the following headings:

- Construction;
- Commissioning;
- Operation;
- Decommissioning; and
- Description of other developments.

2.68 The following sections present a description of each of these aspects.

Description of construction

2.69 The construction of the data centres will comprise three main stages, namely:

- Site preparation works;
- Building construction; and
- Commissioning.

2.70 In terms of the overall development (i.e. both phases of the project to a total of c. 30MW plant), it is proposed that site preparation works will be completed prior to commencement of development. The total peak construction population on site is estimated to be of the order of c. 250 staff (average 150). Site staff will include management, engineers, construction crews, supervisors and others during the three year construction process. During construction access to the site will be via R120. Further details are including in Chapter 12.

Working hours

2.71 The construction of the Proposed Development will be completed during normal construction hours i.e. 7am to 7pm Monday to Friday with a half day working on Saturday (8am -2pm). However, it is possible that the appointed contractors may wish to carry out certain operations, such as concrete pouring, outside these hours i.e. evening hours during long summer days etc. Such occurrences will be notified to the local authority, where required and generally kept to a minimum. Where they do occur, contractors will ensure they take place over as short a timeframe as possible and as such they will not cause disturbance that would impact local residential amenity.

Site preparation works

2.72 Construction of the Proposed Data Centre Development and Power Plant 1 are both due to commence, subject to grant of planning permission, in Q4, 2021. Site Preparation works will include site clearance, soil excavation and levelling; demolition of the house and agricultural buildings as well as the removal of some trees and hedgerow particularly adjacent to the Bulmer property.

2.73 The site has already been subject to initial archaeological investigations in the form of a geophysical survey of the site under licence no. 19E0038. The findings of these investigations are detailed within Chapter 13 of this EIAR.

Noise, vibration and dust nuisance prevention

2.74 With regard to construction activities, reference will be made to BS 5228 (i.e. BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014) *Code of practice for noise and vibration control on construction and open sites*, which offers detailed guidance on the control of noise and vibration from

demolition and construction activities. Various mitigation measures have been considered and will be implemented during the construction of the Proposed Development, such as:

- Limiting the hours during which site activities which are likely to create high levels of noise are permitted, e.g. soil levelling/excavations;
- Establishing channels of communication between the contractor/developer, local authority and residents;
- Appointing a site representative responsible for matters relating to noise and vibration, and;
- Monitoring typical levels of noise during critical periods and at sensitive locations.

2.75 Furthermore, it is proposed that a variety of practicable noise control measures will be employed. These will include:

- Selection of plant with low inherent potential for generation of noise;
- Erection of acoustic barriers as necessary around items such as generators or high duty compressors; and
- Siting of noisy plant as far away from sensitive receptors as permitted by site constraints.

2.76 Noise and vibration control measures are discussed in detail in Chapter 9 - Noise and Vibration.

2.77 The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with environmental factors including levels of rainfall, wind speeds and wind direction. The potential for impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. The majority of dust produced will be deposited close to the generated source.

2.78 In order to ensure that no dust nuisance occurs, a series of measures will be implemented including:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads will be restricted to essential site traffic only;
- If required, any area/road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions;
- Vehicles using site roads will have their speed restricted, and this speed restriction will be enforced rigidly. On any un-surfaced site road, this will be 20km/hour, and on hard surfaced roads as site management dictates;
- In all conditions vehicles delivering material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- Wheel washing facilities will be provided for vehicles exiting the site to ensure that mud and other wastes are not tracked onto public roads;
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary; and
- At all times, these procedures will be strictly monitored and assessed. In the event of dust emissions occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

2.79 Dust nuisance control measures are discussed in further detail in Chapter 10 (Air Quality and Climate).

Water discharges

2.80 Welfare facilities will be provided for the contractors on site during the construction works. Portable sanitary facilities will be provided. Any surface water run-off will be adequately contained and treated prior to being discharged into the SDCC drainage network. See Chapter 7 - Hydrology for a full description of mitigation measures proposed.

Building structure construction

Foundations and structure

2.81 Following the completion of site preparation, all structures will require foundations to structural engineer specifications. Building structures will comprise standard structural steel frames. The foundations will require moderate scale excavations. Local minor dewatering may be required during excavation works and groundworks dependent on the weather conditions at the time of works.

Levelling/Cut and Fill

2.82 It is proposed that some of the spoil generated will be reused under landscaped areas and/or in the formation level for roads and/or the construction compound. Any temporary storage of spoil required will be managed to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment etc.

2.83 Any excess spoil not suitable and/or required for reuse on site will be removed offsite for appropriate reuse, recovery and/or disposal as required (see Chapter 14 – Waste Management). The importation of fill will be required from various locations within the Greater Dublin Area to facilitate construction. This fill material will be sourced by suppliers available as close as possible to the site. Pinnacle Consulting Engineers, have estimated that the importation of fill material will be required for the permitted scheme but will not be required for the Proposed Development.

2.84 Contractors for the Proposed Development will be required to submit and adhere to a method statement (including the necessary risk assessments) indicating the extent of the areas likely to be affected and demonstrating that they will achieve the minimum disturbance necessary to achieve the required works. Any temporary storage of spoil will be managed, as set out under the Outline Construction Management Plan (CMP) to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment etc.

Building envelopes and finishes

2.85 The construction of the walls and roofs of the buildings will closely follow the completion of structures. Typically, the contractors will start by building from the centre of each building and begin fitting out the 1st data storage room within each building as early as possible in the process. The construction of the rest of the building will continue around it.

Roads, services and landscaping

2.86 The internal road system will initially be composed of hard-core material, rolled and compacted sufficiently to support initial construction including civil/structural sub grade works. The data centre facilities will have their own and independent access road and car parking. Most of the soft landscaping will be undertaken to the west, south and north of the proposed buildings under this application, and to the east of the overall site along the R120 and has already been granted permission under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948. Only minor modifications to the modelling of the landscaping is proposed in this instance with the berms remaining of the same height around the site. The majority of these landscaping works, to all boundaries, will be in place within the first planting season following the use of the first data storage room of the permitted development and will therefore be in place ahead of the operation of the proposed data centre and proposed Power Plants.

Material sourcing, transportation and storage materials

2.87 Key materials will include steel, concrete, composite cladding, piping, electrical cabling, process equipment and architectural finishes. A 'Just in Time' delivery system will operate to minimise storage of materials on site.

Sourcing

2.88 Where possible it is proposed to source general construction materials from the Dublin area to minimize transportation distances. Specialised data centre facility equipment will likely be imported.

Storage

2.89 Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure area in the construction compound to prevent contamination. Liquid materials will be stored within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications – BS EN 1992-3:2006) to prevent spillage.

Transportation

2.90 Construction materials will be brought to site by road along the R134 and R120. Construction materials will be transported in clean vehicles. Lorries/trucks will be properly enclosed or covered during transportation of friable construction materials and spoil to prevent the escape material along the public roadway.

Construction and commissioning schedule

2.91 Subject to a grant of a five year planning permission, construction work will be undertaken on a phased basis for the Proposed Development over a circa 3.5 year period and based on customer demand. Based on customer demand this schedule may decrease but for the purposes of the EIA Report the longest possible construction period (worst case scenario) has been taken. A summary of the proposed target dates (earliest possible dates) for the construction of the data centres and power plants are set out below:

- Application for planning permission – Q1 2021;
- Commence site construction works for the proposed data centres (subject to grant of planning permission) – Q4, 2021;
- Complete construction works of Data Centre – Q2, 2023;
- Commence site construction works for Power Plant 1 (subject to grant of planning permission) – Q4, 2021;
- Complete construction works of Power Plant 1 – Q2, 2022;
- Commence site construction works for Power Plant 2 (subject to grant of planning permission) – Q3, 2022;
- Complete construction works of Power Plant 2 – Q1, 2023;
- Commence site construction works for Power Plant 3 (subject to grant of planning permission) – Q4, 2024; and
- Complete construction works of Power Plant 3 – Q2, 2025.

2.92 Each of the following EIAR chapters (Chapters 3-15) include an assessment of the potential impact of all aspects of the construction phase on their individual aspect and set out the relevant mitigation measures relating to that aspect.

2.93 In general, the impact of the construction period will be short term in nature. The permanent HV connections, which will be subject to a separate application, and subject to pre-application consultations with An Bord Pleanála may be considered as Strategic Infrastructure Development, are proposed to be completed within a year sometime over the next few years.

Construction and Environmental Management Plan

2.94 Each of the following EIA Report chapters (Chapters 6-17) includes an assessment of the potential impact of construction works on their individual environmental aspect and set out the relevant mitigation measures relating to that aspect. A Construction and Environmental Management Plan (CEMP) will be put in place by contractors to minimise the impact of all aspects of the construction works on the local environment. The CEMP will include emergency response procedures in the event of a spill, leak, fire or other environmental incident related to construction. A Draft CEMP is submitted with this application.

2.95 The primary potential effects from construction are short to medium term and will include:

- Potential effects in terms of nuisances relating to the air quality of the environs due to dust and other particulate matter generated from excavation works and effects on the noise environment due to plant and equipment involved in construction;

- Potential effects on the land, soils, geology & hydrogeology of the site during construction i.e. some loss of protection of the underlying aquifer to contaminants during site clearance, levelling and excavations etc.; and
- Potential effects on the local road network and its environs due to construction workers and other staff attending site during preparation, construction and commissioning phases.

2.96 Mitigation measures to address each of these potential short to medium term effects are presented in each individual EIA Report chapter.

Commissioning

2.97 Once the first data storage room is built, specialist contractors will be mobilised to complete the commissioning of the first data storage room and related plant within each data centre. Commissioning will be carried out on a phased basis as each data storage room is completed, over a period of several months. This commissioning process will be repeated across each of the two data centre facilities. Any hard landscaping will be completed following completion of the construction of the core of each of the facilities.

Operation of the project

Data Centre Facility Operation

2.98 Once operational, each data centre facility will "go live" and serve data customers on an ongoing basis. The server systems and the supporting infrastructure will be monitored by site staff and faults identified and remedied as required. Staff are primarily required onsite for security, ongoing monitoring and maintenance of plant and equipment.

Staffing and parking

2.99 Once operational, c. 30 full time employees will be present on site daily in the Data Centre facilities. Security staff (6 no. total) will be required at all times as well as service staff from outside the data centre facility particularly in relation to the Power Plant. During the night shift a reduced number of staff will be required with 10 in the data centre facilities.

2.100 Accordingly, it is proposed to provide 39 car parking spaces on site. This assumes a vehicle occupancy level of c. 1 persons/vehicle (62 Spaces) and take account of an allowance for visiting/maintenance staff as well as enabling a smooth transition between shifts. Included within this shall be 4 no. spaces provided for disabled parking and 2 no. E-charging spaces (with cabling for a further 2 spaces).

2.101 The facility will operate on 3 no. 8 hour shift basis (8am to 4pm; 4pm-12am and 12am-8am). Working hours are expected to be 24 hours a day, 7 days a week. The total persons anticipated to travel to and from the site over a 24 hour period, and therefore employed directly on site, is therefore c. 100. Additional service staff and other deliveries etc. would be addition to this. Traffic relating to staff movements has been assessed as part of the Traffic and Transportation chapter of this EIA Report (Chapter 12).

Decommissioning of the project

2.102 The lifespan of the Proposed Development is not defined but it is anticipated that it will be at least 20 years from full completion. It is likely that regular maintenance and periodic upgrading of the facility over time will enable it to continue to meet future demands. Upon closure all buildings, plant, equipment, drainage networks etc. at the site will be fully decontaminated and decommissioned in accordance with prevailing best practice. The buildings once rendered environmentally safe will more than likely be retained or sold on for future use following closure.

Description of other developments

2.103 A list of the other developments in the vicinity of the Proposed Development is provided in Chapter 3 (Planning and Development Context) of this EIA Report. The Permitted Development in the south-eastern part of the overall site is outlined within Chapter 3 as well as earlier within this Chapter.

Sustainability energy efficiency & resource use

2.104 The Operator is committed to running its business in the most environmentally friendly way possible. The Proposed Development has been designed to take into account these policies with energy efficiency central to the decision-making process, minimising power and water consumption.

Energy efficiency benefits

2.105 A typical ICT facility achieves approximately 65% server utilization rates versus 15% at on-premises servers. This typically means companies moving their data storage to the cloud require less than a quarter of the server infrastructure they would need if provided on-premises. A typical on-premises data centre is 29% less efficient in their use of power compared to a typical large-scale data centre that uses world-class facility designs, cooling systems, and workload-optimized equipment. Adding these together (fewer servers used plus better power efficiency), cloud customers need 16% of the power required by those on-premises infrastructure. This represents an 84% reduction in the amount of power required.

Sustainability

2.106 In preparation for this application, the Operator and their design team have undertaken an assessment of a variety of sustainable design measures to assist with achieving its overall sustainability and energy efficiency targets. The energy strategy for the Proposed Development is set out in an *Heat Recovery Feasibility Report* which forms a stand-alone document that accompanies the planning application. Some of the key measures incorporated into the design as set out in the Heat Recovery Feasibility Report have been summarised below.

2.107 The location of the facility in Ireland allows for the use of free-cooling media without the need for mechanical cooling, to take advantage of this, the air handling equipment will be fitted with airside condensers to utilise this outdoor air to cool the space. The Heat Recovery Feasibility Report also describes how waste heat associated with the facility could be utilised with a future district heating scheme developed by others. The Permitted Development ensures the future proofing of the site from that perspective, and the current proposal would integrate and link into this infrastructure.

Health & safety

Design and Construction Health and Safety

2.108 The Proposed Development has been designed in accordance with the Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005) as amended and the Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. 299 of 2007) as amended and associated regulations.

2.109 The Proposed Development has been designed by skilled personnel in accordance with internationally recognised standards, design codes, legislation, good practice and experience based on a number of similar existing facilities operated by the Operator.

General operational health and safety

2.110 The Operator implements an Environmental Safety and Health Management System at each of its facilities. Prior to start up a comprehensive set of operational procedures will be established (based on those used at other similar facilities) to ensure a smooth roll out of operations at each facility.

Major accidents / disasters

2.111 The 2014 EIA Directive and associated EPA Draft EIA Report Guidelines 2017 requires that the vulnerability of the project to major accidents, and/or natural disasters (such as earthquakes, landslides, flooding, sea level rise etc.) is considered in the EIA Report. The site has been assessed in relation to the following external natural disasters; landslides, seismic activity and volcanic activity and sea level rise/flooding as outlined below. The potential for major accidents to occur at the data centre has also been considered with reference to Seveso/COMAH.

Landslides, Seismic Activity and Volcanic Activity

2.112 There is a negligible risk of landslides occurring at the site and in the immediate vicinity due to the topography and soil profile of the site and surrounding areas. There is no history of seismic activity in the vicinity of the site. There are no active volcanoes in Ireland so there is no risk of volcanic activity. Further detail is provided in Chapter 7 - Land, Soils, Geology & Hydrogeology.

Flooding/Sea Level Rise

2.113 The potential risk of flooding on the site was also assessed. A Stage 1 Flood Risk Assessment was carried out and it was concluded that the development is not at risk of flooding. The assessment indicates that the Proposed Development would not adversely impact on the flood risk for other neighbouring properties. Further detail is provided in Chapter 8 - Hydrology and the accompanying Stage 1 Flood Risk Assessment undertaken by Pinnacle, Consulting Engineers that forms a stand-alone document as part of the planning application. Given the inland location of the site, it is not at risk from sea level rise.

Seveso/COMAH

2.114 The Proposed Development will not be a Seveso/COMAH facility. The only substance stored on site controlled under Seveso/COMAH will be diesel for generators and the amounts proposed do not exceed the relevant thresholds of the Seveso directive.

Minor accidents/leaks

2.115 There is a potential impact on the receiving environment as a result of minor accidents/leaks of fuel/oils during the construction and operational phases. However, the implementation of the mitigation measures set out in Chapters 7 and 8 will ensure the risk of a minor accident/leak is low and that the residual effect on the environment is imperceptible.

Potential impacts of the Proposed Development

2.116 The Proposed Development is to be located on EE zoned lands with the objective "*To provide for enterprise and employment related uses" under the South Dublin County Development Plan 2016-2022 and located* adjacent to extensive industrial development. The development, when operational, will generate limited additional traffic, air, noise and water emissions and waste generation from activities etc.

2.117 During construction, there is the potential for short to medium term nuisance impacts from traffic, dust, noise and construction waste, if not carefully managed. The Operator will require contractors to implement a CEMP to ensure each of these potential impacts are minimised.

2.118 Each chapter of this EIA Report assesses the potential impact of the construction and operation of the Proposed Development on the receiving environment. Please refer to each specialist chapter respectively.

Residual Impacts

2.119 The residual impacts of the Proposed Development following the implementation of mitigation measures have been addressed in each of the following chapters. These mitigation measures are similar to those approved in the existing planning permission for a data centre facility development at the site.

Do Nothing Scenario

2.120 Each of the following chapters addresses the Do-Nothing scenario as required in the EPA 2017 guidelines. The Do-Nothing scenario is to retain the site in its existing state with one derelict and one abandoned residential property, and associated buildings and farmland.

Related development and cumulative effects

2.121 The Proposed Development is for 2 no. data centre buildings as well as three no. Gas Power Plants and associated ancillary development on a site that will be built on a phased basis to meet customer demand.

2.122 The cumulative effect of the Proposed Development together with other relevant developments, has been considered within each chapter of the EIAR under the heading cumulative impact. Due to the location of the Proposed Development site away from other planned or permitted development, beyond that of the Permitted Development on site, the cumulative assessment has focussed on the build out of the Proposed Development site of the Permitted and Proposed Development. Other adjacent developments have also been considered where appropriate and relevant to that particular chapter.

2.123 The permitted 110kV GIS Substation and the future two 110kV underground transmission lines from the permitted substation to another substation will be located centrally within the overall site. The provision of the transmission lines will be subject to their own application(s). They will be subject to pre-application consultations with An Bord Pleanála and may be determined as being Strategic Infrastructure Development.

2.124 There is potential for both developments to be in construction at the same time, although this is dependent on customer demand, and dates of final grants of permission. On completion of the Proposed Developments, the current site area has the capacity to absorb a further data centre. However, no plan for when customer demand will require this to enter the planning process is currently outlined. In each of the chapters, the impact of the permitted and the Proposed Development has been considered in terms of them being in construction and operating at the same time.

2.125 With mitigation for each environmental aspect, it is anticipated that the potential cumulative impact of the Proposed Development in conjunction with the other developments will generally be slight/moderate, negative/neutral and short term in duration across all environmental topics during construction. With mitigation for each environmental aspect, it is anticipated that the potential cumulative impact of the Proposed Development in conjunction with the other developments will generally be slight, negative/neutral and long term in duration across all environmental topics once in operation.

3. PLANNING AND DEVELOPMENT CONTEXT

3.1 The following section details compliance of the Proposed Development, as described in Chapter 2, with regard to national policies and objectives as well as local planning policy under the South Dublin County Development Plan 2016-2022.

National Planning Framework

3.2 The National Planning Framework (NPF) was published in February 2018 setting out a vision for Ireland in land use and planning terms to 2040. The NPF replaced the National Spatial Strategy once it was adopted as the long term land use and planning vision for Ireland.

3.3 National Strategic Outcome 6 of the NPF relates to the creation of *"A Strong Economy Supported by Enterprise, Innovation and Skills"*. This strategic outcome is underpinned by a range of objectives relating to job creation and the fostering of enterprise and innovation. The following objective, relating to Information and Communications Technology (ICT) infrastructure (including datacentres) is included under National Strategic Outcome 6:

"Promotion of Ireland as a sustainable international destination for ICT infrastructures such as data centres and associated economic activities."

3.4 The Proposed Development comprises the provision of 2 no. new data centre facilities and associated ancillary development, in a location which is well suited and serviced to accommodate such a use. The NPF also states under National Strategic Outcome 6:

"Ireland is very attractive in terms of international digital connectivity, climatic factors and current and future renewable energy sources for the development of international digital infrastructures, such as data storage facilitys. This sector underpins Ireland's international position as a location for ICT and creates added benefits in relation to establishing a threshold of demand for sustained development of renewable energy sources."

3.5 The NPF is favourably disposed to the location of data centre / ICT infrastructure in Ireland, and the Proposed Development, which comprises of such data centre infrastructure, is therefore considered to be wholly in accordance with this key body of national planning policy.

Regional Spatial and Economic Strategy for the Eastern and Midlands Regional Assembly

3.6 The Regional Spatial and Economic Strategy (RSES) for the Eastern and Midlands Regional Assembly (EMRA) includes Regional Policy Objective (RPO) 8.25 which states the following:

"Local Authorities shall:

- *Support and facilitate delivery of the National Broadband Plan.*
- *Facilitate enhanced international fibre communications links, including full interconnection between the fibre networks in Northern Ireland and the Republic of Ireland.*
- *Promote and facilitate the sustainable development of a high-quality ICT network throughout the Region in order to achieve balanced social and economic development, whilst protecting the amenities of urban and rural areas.*
- *Support the national objective to promote Ireland as a sustainable international destination for ICT infrastructures such as data storage facilities and associated economic activities at appropriate locations.*
- *Promote Dublin as a demonstrator of 5G information and communication technology."*

3.7 The site is therefore considered to be an appropriate location for the development of data centre / ICT facilities under this Strategy.

South Dublin County Development Plan 2016-2022

3.8 The South Dublin County Development Plan is the statutory planning document that covers the entire South Dublin administrative area. The Plan was adopted in June 2016 and was the subject of Variations which were adopted by South Dublin County Council on 21st May 2018. The Proposed Development is to be located within an area zoned EE (Enterprise and Employment) under the County Development Plan back in 2016 and was not subject to the Variation. The zoning Objective EE seeks: "*To provide for enterprise and employment related uses".*

3.9 The proposed use is a permitted use under this zoning. Significant precedent exists for the establishment of this use on other EE zoned lands in the area. EE zoned areas are established economic industrial areas running essentially in an arc northwards from City West to Grange and Grange Castle.

3.10 It is the policy of the Council to support sustainable enterprise and employment growth in South Dublin and in the Greater Dublin Area, whilst maintaining environmental quality. A number of objectives relate to EE zoned lands that include ET3 Objective 2 that states:

"To prioritise high tech manufacturing, research and development and associated uses in the established Business and Technology Cluster to the west of the County (Grange Castle and Citywest areas) to maximise the value of higher order infrastructure and services that are required to support large scale strategic investment."

3.11 Policy ET3 Objective 5 requires that "*all business parks and industrial areas are designed to the highest architectural and landscaping standards and that natural site features, such as watercourses, trees and hedgerows are retained and enhanced as an integral part of the scheme*". The proposal retains and enhances natural site features, wherever possible, by the use of the highest architectural, engineering and landscaping design standards.

3.12 Policy ET3 Specific Local Objective 1 supports the conducting of a review of the zoning of lands south of the Grand Canal and west and north of the R120, with a view to preparing a long term plan for the expansion of the Grange Castle Economic and Enterprise Zone, to accommodate strategic investment in the future, while also seeking to provide public open space along the Canal, including a natural heritage area in the vicinity of the historic canal quarries at Gollierstown. This rezoning has formed Variation no. 1 of the County Development Plan and included the rezoning of lands to the west and south-west of the Proposed Development site (as referenced above) as part of a large overall body of land for Enterprise and Employment generating uses. The purpose of variation no. 1 is to change the zoning objective of 193 hectares of land from zoning objective RU (Rural) to objective EE (Enterprise and Employment). These lands which were rezoned by way of Variation no. 1 are located at Grange Castle West, which are south of the Grand Canal and furtheer west of the R120, adjoining the existing Grange Castle Business Park. It also seeks to realign the indicative route for the Western Dublin Orbital Route (North).

3.13 Section 11.7.6 of the Plan sets out that development proposals for new industrial and commercial developments and large extensions to existing premises, where the processes associated with the primary operation of the proposal generates significant waste heat must carry out an energy analysis of the proposal and identify the details of potential waste heat generated and suitability for waste heat recovery and utilisation on site and with adjoining sites. This is required to include heat recovery and re-use technology on site, and include heat distribution infrastructure above or below ground (include future proofing of the building fabric to facilitate future connection). An Heat Recovery Feasibility Report in full compliance with section 11.7.6 of the County Development Plan by Ethos Engineering Ltd. accompanies the application.

3.14 The nature of the overall design has been informed by a site analysis of environmental issues. This has included noise and air quality objectives. The enhancement and creation of new bio-diversity corridors to fully integrate the scheme into the surrounding environment to ensure that direct and cumulative effects on biodiversity are addressed in the overall design. Suitable attenuation and sustainable drainage systems have also informed the design. This mitigation of design also significantly increases native tree planting within the site from its current position. The design incorporates SUDS fully in accordance with policies of the Plan.

3.15 In conclusion it is considered that the proposal is in accordance with the policies and objectives of local, regional and national land use planning policy.

Planning history

Proposed development site

Reg. Ref. SD19A/0042 / ABP Ref. PL06S.305948

3.16 Permission was granted on the 5th October 2020 for the phased development of 4 single storey data halls within two data centre buildings all with associated plant at roof level, 32 standby generators, office and service areas, service road infrastructure, car parking, ESB substation/transformer yard, An EIAR was submitted with the application for the development that had an overall gross floor area of 17,685sqm. The development also included a temporary gas-powered generation plant within a walled yard containing 19 no. generator units (15 + 4 arrangement) with associated flues (each 17m high) to be located to the west of the proposed data halls.

3.17 Following a request for Further Information, the number of generators within the Power Plant was reduced to only 8 operating with two back up units and limited to a lifespan of two years.

3.18 The decision of the Board was subject to 19 conditions. Condition no. 16 relating to noise outlined that operational noise shall not exceed 45dB(A) Leq 1 hour between 2000 and 0800, and 55dB(A) Leq 1 hour at all other times. The condition in full stated:

> *"The operational noise level shall not exceed 55 dB(A) Leq 1 hour (corrected for any tonal or impulsive component) at the nearest noise sensitive locations, including dwellings, between 0800 and 2000 hours, Monday to Friday inclusive, and shall not exceed 45 dB(A) Leq 1 hour at any other time. All sound measurement shall be carried out in accordance with ISO 1996-1:2016 "Acoustics - Description, measurement and assessment of environmental noise - Part 1: Basic quantities and assessment procedures". Procedures for the purpose of determining compliance with this limit shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development."*

3.19 This permission has not commenced on site.

Reg. Ref. SD19A/0004

3.20 A separate planning application was lodged with South Dublin County Council for enabling works on the southern part of the Proposed Development site to carry out the required earthworks and site preparation works to facilitate the development proposed under this application. This application was granted permission in 2019. No works have commenced in relation to this permission.

Adjoining Edgeconnex site to the east of the R120

Reg. Ref. SD16A/0176

3.21 A planning application was lodged with South Dublin County Council for enabling works on the southern part of the site to the east of the R120 to carry out the required demolition, earthworks and site preparation works to facilitate the Proposed Development. This application was made prior to the making of application under Reg. Ref. SD16A/0214 in order to facilitate the clearing of the site for future development.

Reg. Ref. SD16A/0214

3.22 A decision to grant planning permission for phase 1 of the development of this Edgeconnex data centre facility to the east of the R120 was made on the 11th August 2016. The proposed data centre and associated elements has a gross floor area of 5,839sqm amounting to a site coverage of 9% over the entire site of 6.5hectares. The buildings consist of the following primary components:

- 1 no. single storey data halls with roof plant and stand-by generators to be located to its east to be built primarily on the northern part of the southern extent of the overall site;

- Single storey goods receiving area and storage, and single storey office to be located to the north of the data hall; and
- ESB sub-station.

3.23 The overall height of the development is dictated by the parapet screen to the roof plant of the data hall that is circa 10.5m above finished ground level. The other building elements will be lower. External plant consisting of 6 no. standby generators will be located to the east of the data hall. The standby generators will be screened from view. Mechanical units will be located on the roof and will also be screened from view and treated similar to adjacent developments. The generator flues will extend circa. 15m above ground level above each generator.

Reg. Ref. SD16A/0345

3.24 Permission was granted on the 10th January 2017 to extend the data hall facility by the construction of a new data hall of 4,176sqm to the immediate south of the data hall of 4,435sqm and single storey office of 1,341sqm permitted under Reg. Ref. SD16A/0214. The permitted extension of the data centre and associate elements include the following primary components:

- 1 no. single storey data halls with roof plant and 5 no. stand-by generators to be located to its east to be built to the immediate south of the data hall and generators permitted under Reg, Ref. SD16A/0214;
- Temporary gas generation plant within walled yard measuring 2,811sqm and containing 12 no. 1.875 MVA sized container units to be located within the Takeda lands to the east of the site (it is this element that is the subject of this amendment application); and
- New two storey ESB substation (507sqm) with associated transformer yard and building (157.5sqm) to replace gas generation plant on upgrade of electricity connections in the area.

3.25 The temporary gas generator plant permitted consisted of an open walled yard of 2,811sqm that will contain 12 no. 1.875 MVA sized container units. All these are gas fired engines that result in lower emissions than the comparable diesel fired alternative. The temporary plant will operate on a continual basis until such time as the load demand can be accommodated on the electrical utility grid, which is currently predicted to be sometime in 2019. The plant will be decommissioned when the plant is replaced by a permanent utility connection in 2019. The permanent power supply arrangement to the site will be realised by the construction of the new ESB 110kV sub-station and transformer yards.

Reg. Ref. SD17A/0027

3.26 Permission was granted on the 4th April 2017 for the potential future relocation of the temporary gas generator plant permitted under Reg. Ref. SD16A/0345 on lands owned by Takeda, to lands within the applicant's control. This permission will only be implemented if there is a need to relocate the temporary generator farm from the Takeda lands.

Reg. Ref. SD17A/0141

3.27 Permission was granted on the 14th August 2017 for a new stand-alone single storey data hall of 1,515sqm to the immediate north of the data hall, and its extension, permitted under Reg. Ref. SD16A/0214 and SD16A/0345. The attenuation pond was permitted to be enlarged under this permission. It is the data hall permitted under this application that is to be modified under the current application.

Reg. Ref. SD17A/0392 / ABP Ref. ABP-300752-18

3.28 Permission was granted by the Board on the 26th July 2018 for a 125sqm extension and other modifications to the permission granted under SD17A/0141. The decision upheld the decision of the Planning Authority following a single third party appeal.

Reg. Ref. SD18A/0298

3.29 Permission was granted on the 27th November 2018 for development of 2 no. new single storey data halls and associated office areas, and plant, with a gross floor area of 5,823sqm. The first data hall of 1,857sqm was located to the immediate east the data hall that was permitted and subsequently extended under Reg. Ref. SD17A/0141 and SD17A/0392. The second data hall (3,005sqm) will be located to the north of the extended data centre granted under Reg. Ref. SD17A/0141 and SD17A/0392 and to the south of the permitted attenuation pond.

3.30 The permission will also facilitate the relocation and redesign of the ESB substation and associate transformer yard. This permission once implemented will result in the site to the east of the R120 being fully developed.

Other ongoing development

3.31 A pre-application consultation (PAC) has been held with An Bord Pleanála in relation to the proposed transmission lines connecting the permitted substation serving the eastern part of the site with the Grange Castle 110kV substation. A determination on this PAC is due by the 29th March 2020 as to whether the development amounts to Strategic Infrastructure Development or not.

Consultation with South Dublin County Council

3.32 The project team have liaised with the relevant departments of South Dublin County Council (SDCC) in advance of lodgement of this application. A pre-planning meeting was held with SDCC on the 9th February 2021 and representatives of the SDCC Planning, Engineering and Roads/Transportation Departments attended. The meeting raised a number of points of relevance to the application. These were considered and have been addressed in the overall planning application package and within the EIA Report.

3.33 In addition, the relevant project team specialists have liaised with the Department of Defence, Water Services and Parks Departments of SDCC by correspondence during the course of the EIA Report preparation. EIA contributors/authors have incorporated advice and comments received from SDCC into the relevant chapters of this EIA Report.

Conclusions

3.34 The Proposed Development, described in Chapter 2 of this EIA Report is fully in accordance with local, regional and national land use planning policy. The subject site is suitably zoned for enterprise and employment purposes and the precedent for data centre development on such zoned lands is well established and clearly set within the wider local area.

3.35 A construction car park and compound will need to be located on the Proposed Development site. This is envisaged to be located to the immediate east of the proposed data centre where the permitted substation as granted under Reg. Ref. SD19A/0042 / ABP Ref. PL06S.305948 is proposed to be located.

3.36 Its central position within the site will ensure that there is no delay in creating the landscaping around the site. The final details of the construction compound will be dependent on the appointed contractors. The construction compound is temporary in nature and again allowable under the zoning objective with precedent for similar temporary compound arrangements on EE zoned lands both within and outside the Grange Castle Business Park.

3.37 The content of this EIA Report identifies potential environmental risks and how they will be addressed and mitigated in the design, during construction and during the operational phases of development. Details of the various environmental topics are identified and discussed in the following chapters of the EIA Report.

4. CONSIDERATION OF ALTERNATIVES

4.1 EIA legislation and the prevailing Guidelines and best practice require that Environmental Impact Assessment Reports (EIA Reports) consider reasonable alternatives, for example in terms of do nothing alternative; project locations; alternative designs / layouts; alternative processes; and alternative mitigation measures.

4.2 This chapter describes the alternatives that were considered for the Proposed Development under each of these headings and the reasons for the selection of the preferred options.

Do-nothing alternative

4.3 The Proposed Development site of the data centre facilities is not subject to any planning permissions other than that for the enabling works and the previous permission under Reg. Ref. SD19A/0042 / ABP Ref. PL06S.305948 that relates primarily to other lands within the wider site. Given the EE zoning the objective of which is "*To provide for enterprise and employment related uses*" on the site under the South Dublin County Development Plan 2016-2022; and nearby land uses both within Grange Castle and Grange Castle South Business Parks it is reasonable to assume that if the Proposed Development were not to go ahead that the land would be subject to the already permitted development and landscaping as granted under Reg. Ref. SD19A/0042 / ABP Ref. PL06S.305948. The permitted development would also require a back-up and permanent power solution in the event of the Proposed Development not going ahead.

Alternative project locations

4.4 While a wide variety of general environmental and economic criteria were considered, the key criteria for the location of the Proposed Development were:

- Availability of a high-quality telecommunications fibre network;
- Accessibility to the natural gas network (to provide energy for the high efficiency power and cooling systems required to operate the facility);
- Availability of a suitably large site with suitable development zoning;
- Low environmental sensitivity being within a predominantly industrial area;
- Site specifically designed for large scale industrial activities with good water, wastewater and road access;
- Proximity to and availability of suitable power supply
- Local planning precedent for the granting of permission for data centre facilities (including already on site); and
- Low natural disaster risk particularly in relation to flooding.

4.5 Furthermore, the subject site is undeveloped apart from the farm buildings to the north; and the permitted development that has not commenced. The land is zoned as Enterprise and Employment (EE) use for the purpose of economic development and the growth of employment opportunities. As such, the chosen location is suitable for growth and further development in industrial use. The Flexible Demand nature of the Eirgrid offer for the site requires a permanent and back-up power for the already permitted development as the permitted open generation yard only has power to facilitate a small portion of the permitted development.

4.6 As detailed above, the Proposed Development is a logical addition to the land use pattern of Grange Castle, and the permitted development on this site, as it met the highest proportion of the necessary criteria. The site has the required infrastructure available or close to the development site. The permitted 110kV GIS Substation is already permitted and its 110kv connections will be subject to a future application. That application will be subject to pre application consultations with An Bord Pleanála (ABP), who may consider the works to be Strategic Infrastructure Development requiring their own EIA Report to be made to ABP.

Alternative design / layouts

4.7 The team under the direction of the Proposed Development Architects have carried out a number of studies for the overall utilization of the site. A number of alternative layouts for the site were considered

based on the current Proposed Development and overall Master Plan. These were largely informed and defined by the permitted development. These were based on the spatial distribution of the various aspects within the site and the need to maximise distances from the Power Plant element to the nearest sensitive receptors. As the overall site is approximately rectangular in shape a number of iterations of site layout were considered to arrive at the proposed arrangement of buildings, access and site infrastructure as part of the master plan. This general arrangement has not altered significantly, apart from the need for the Power Plants since the first application was made on the site under Reg. Ref. SD19A/0042 / ABP Ref. PL06S.305948.

4.8 The proposed master plan layout was determined based on the following fundamentals:

- The proposed Power Plants were to be set furthest back within the site to ensure maximum mitigation of air and noise emissions to off-site receptors;
- The need to maintain the permitted landscape buffer that will include 3-7m high bunds and a mature planting of a row of three native trees along its top around the entire site;
- Access to the site was to be off the R120 to the east as permitted under the 2019 application;
- The location of the buildings at these various locations was considered preferential in terms of minimising the amount of excavation required across the site; and
- The main surface water attenuation pond is located downgradient of the majority of the site adjacent to the northern part of the site within the RU zone that precluded the data centre facilities being located further north within the site.

4.9 The location and arrangement of the uses on the site allows the Applicant to achieve the balance between minimal environmental effects, and an appropriate level of development on the site.

Alternative Processes

4.10 The proposed data centre facilities will employ the same data server technology that is used at other facilities that represents state of the art technology. The facility has been designed to meet and exceed the standards of minimum energy efficiency for data centre facilities. The proposed and permitted data centre facilities are dependent in the short term on the provision of power on a permanent basis from the Power Plants that form part of the Proposed Development. Alternative power sources to the Power Plants were considered similar to that permitted under the 2019 permission although it was evident that their noise generation and power generation would be significantly deficient in terms of providing both the short-term permanent power, but also the permanent back up power to the National Grid required under the Flexible Demand offer provided by Eirgrid.

Alternative mitigation

4.11 For each aspect of the environment within Chapters 6 – 16 of this EIA Report, each specialist has considered the existing environment, likely impacts of the Proposed Development and reviewed feasible mitigation measures to identify the most suitable measure appropriate to the environmental setting of the Proposed Development. In making a decision on the most suitable mitigation measure each specialist has considered relevant guidance and legislation (these are identified in the table of mitigation measures in Chapter 2 – Appendix 2.2). In each case, the specialist has reviewed the possible mitigation measures available and considered the mitigation in terms of the likely residual impact on the environment.

4.12 The four established strategies for mitigation of effects have been considered: avoidance, prevention, reduction and offsetting (not required in this development). Mitigation measures have also been considered based on the effect on quality, duration of impact, probability and significance of effects. These represent the best practice for achieving minimal impact on the receiving environment. Whilst alternatives were considered in the EIAR process, the measures presented represent the best options for the site.

Conclusions

4.13 The Proposed Development site is considered an excellent location for the two data centre facilities from both an environmental and a planning perspective. The site has excellent access to the required

utility infrastructure (most notably the future power and fibre telecommunications networks) which will mean minimal disruption to adjacent site users and nearby sensitive receptors during site development.

4.14 The Project Design as proposed provides the most appropriate design and layout that maintains the required landscaping in terms of berms and planting to boundaries and particularly the 80-100m landscape buffer to the Grand Canal and high quality elevation treatment that includes the use of vertical shaded green panels of various length and shades to the west, south and north elevation. This elevational treatment, accepted by the Planning Authority on previous Edgeconnex data centres on site and adjoining site, helps to visually integrate the development into the surrounding area, and particularly in the context of views from the canal.

4.15 In the do-nothing scenario, if the facility were not to proceed on the selected site then it is likely that the site will be developed in accordance with a future granted planning permission. However, the Proposed Development of a state of the art data centre facilities if successful would maximise the use of this site and make it a substantial asset in the local regional and national economy, particularly in light of the emergence of Ireland as a "Digital Hub" for Europe.

4.16 The assessment of the design and location of the stacks and back-up generators, as well as the Power Plants, in the project design have been considered to minimise environmental effects. The tallest buildings and those generating the most noise (the Power Plants) have been located furthest away from noise and visually sensitive receptors. The site has the required infrastructure readily available or in close proximity for the development. This includes the provision of a 110kV GIS Substation within the centre of the site that was granted under Reg. Ref. SD19A/0042 / ABP Ref. PL06S.305948 as well as a Flexible Demand offer from Eigrid. As detailed in Chapter 2, the Flexible Demand Offer requires the Power Plants to remain following the connection to the National Grid as a source of a back-up power supply to the Proposed and already permitted development on site.

4.17 The siting and design of the Proposed Development at an existing greenfield site in Grange Castle has been carefully selected based on a consideration of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) and having undertaken a comparison of environmental effects. The Proposed Development will considerably enhance the utilisation of the site. In conclusion it is considered that the proposed site has significant capacity for development and is highly suitable for a data centre facility use.

5. POPULATION AND HUMAN HEALTH

5.1 This chapter of the EIA Report considers and assesses the *"existence, activities and health of people"* with respect to *"topics which are manifested in the environment such as employment and housing areas, amenities, extended infrastructure or resource utilisation and associated emissions" as set out under the* EPA Draft EIA Report Guidelines 2017. In addition, this chapter assess more broadly the impact of the Proposed Development on the land use of the area, recent trends in population, employment and economic performance, and the community. The assessment also considers the mitigation measures necessary to reduce, and if possible remedy, significant adverse effects on these elements of the environment.

5.2 Population and human health comprise one of the most important elements of the *"environment"*. Any potential impact on the status of the population or human health by the Proposed Development must therefore be assessed. The principal concern is to ensure that human beings experience no significant unacceptable diminution in aspects of *"quality of life"* as a consequence of the construction and operation of the Proposed Development. Relevant components in this section of the EIA Report, include land use, population, employment, and amenity aspects.

5.3 In addition to the impacts on population and human health dealt with under this chapter, the impacts on human beings are also considered in Chapter 9 – Noise and Vibration; Chapter 10 – Air Quality and Climate; and Chapter 11 – Landscape and Visual. The impacts on property are considered in Chapter 15 - Material Assets. The cumulative effect is addressed in the individual chapters of this EIA Report. Interactions are addressed in Chapter 16 of this EIA Report.

Methodology

5.4 This assessment was undertaken in accordance with the EPA Draft EIA Report Guidelines 2017; and Draft Advice Notes on Current Practice in the preparation of Environmental Impact Statements (EPA 2015).

5.5 An examination of the following information was undertaken in order to establish the existing land use pattern, location of residences and services. A desktop survey of the west Dublin area as well as an analysis of the local area and its facilities was undertaken. The desktop analysis included a review of background studies and reports; maps and aerial photography of the area; and review of demographic characteristics of the area as ascertained from Census of Population data and other statistics released by the Central Statistics Office (CSO).

Impact assessment rating

5.6 In undertaking the assessment of the impact of the Proposed Development on population and human health the following impact criteria was employed. Both positive and negative impacts are considered and the significance of the impacts rated as imperceptible, slight, moderate, significant and profound as per the EPA Draft EIA Report Guidelines 2017. Table 1.2 in Chapter 1 presents definitions for the impact levels used in this study, as defined by the EPA.

Receiving environment

5.7 This section describes the existing environment with regard to employment, human health and amenity.

Land use

5.8 Land use can have a key impact on population health and amenity. The Proposed Development is to be located in the north-west and south-west corner of the overall site. The site is currently primarily in agricultural use, with an abandoned agricultural property and associated buildings, some of which have recently collapsed located to the north along the boundary with the canal. The abandoned property is in very poor condition with a further former property in ruins along this northern boundary along the canal (see next page). These former houses are required to be demolished as part of this application in order to facilitate the attenuation pond proposed under this application. Neither property are of architectural interest, and offer no potential to be reused for residential purposes. Some of the

lands along the eastern boundary were subject to works and were used as construction compounds under the R120 realignment.

Figure 5.1 Derelict and abandoned residential properties within northern RU zone to be demolished under the application

5.9 There is a single residential property that bounds and is outside the site to the north-east adjacent to the old canal bridge and lock. This house is located within the RU zoning and is served by a rear garden that backs onto the canal. The house is located some 370m from the nearest data hall and 500m from the nearest Power Plant. The permitted attenuation pond and mitigation landscaping under the previous application on the site will be located adjacent to the house in this corner of the site.

5.10 The residential properties to the immediate east of the subject site are primarily in a ribbon form of development and almost entirely located on the east side of the Adamstown / Newcastle Road (R120). There are three residential properties located to the east of the R120 opposite the main development part of the site being applied for under this application. There are further ribbon development to the north along the eastern side of this realigned road, as well as either side of the road further south. A travellers halting site (Rock Road Mansions) is located some 240m south-west of the nearest Power Plant.

5.11 The area in which the proposed site is located lies within the functional area of South Dublin County Council. Under the Council's Development Plan, a variety of land use objectives are established for the area. These objectives include providing for high quality developments, which are entirely appropriate to and fully compatible with the Proposed Development. This has been further corroborated by the further expansion of the EE zoning on the land to the west of the subject site under Variation no. 1 of the County Development Plan.

5.12 Economic clusters and corridors are geographic concentrations of competing, complementary or interdependent firms and industries that may do business with each other and or have common needs for talent, technology and infrastructure and rely on the services of other cluster firms in the operation of their business. The areas of and surrounding Grange Castle and City West (existing established industrial areas) are cited as two particularly important areas for the creation of a cluster of high end economic development based around Foreign Direct Investment manufacturing and support industries. The positive characteristics of these areas is the availability of large plot sizes, infrastructure and heavily landscape corporate park models.

5.13 Grange Castle Business Park and surrounding lands is already home to several industrial facilities and comprises a number of different land uses (See Figure 5.1) These include the permitted development on the site; the permitted Edgeconnex data centre facility and associated offices on the lands to the east of the R120; two large biotechnology facility campuses – Pfizer Ireland and Takeda Pharma Ireland Ltd. Microsoft's data centres (DUB03- DUB06) are also located within the business park to the immediate south-east, and in close proximity to the site of the Proposed Development. They are currently constructing a much larger data centre campus to the immediate west of the Pfizer campus that will significantly extend the proposed use in this location.

5.14 Aryzta AG (Cuisine de France) have a purpose built food facility located south-east of the proposed development site. A further application for a larger data centre within Grange Castle South Business Park has been granted by the Planning Authority and is subject to a third party appeal to An Bord Pleanála. Other land uses adjacent to the application site include agricultural lands zoned as EE

to the west and south; the traveller site to the south-west; and the Newcastle Golf Centre and Peamount Hospital to the south-west.

Figure 5.2 Existing and proposed land use in vicinity of subject site (residential properties outlined by white ring and abandoned properties outlined in yellow)

5.15 The large residential area of Clondalkin sits some distance away and to the east of the R136 that connects different parts of the outer part of west Dublin that include Griffeen Valley and Adamstown to the immediate north and wider west Lucan area.

5.16 The area has excellent transport infrastructure due to its strategic location on the outskirts of the Greater Dublin Area. The subject site and adjacent Grange Castle Business Park lies between the N4 and N7 National Primary Routes and approximately 7km to the west of the M50 motorway. The Nangor Road and the R136 Outer Ring Road provide access to the site via the Grange Castle Business Park. The N7 can be accessed by way of the R136. The site is also close to the mainline rail connections to the West and South of Ireland, including the new Adamstown commuter railway station, and planned others, and enjoys easy access to Dublin city centre, Airport and Dublin Port.

5.17 The Proposed Development is situated on suitably EE zoned lands with no development beyond mitigation landscape and attenuation proposed within the RU zoned lands to the immediate south of the canal that forms an 80-100m landscape buffer to the Proposed Development. Furthermore, the location will minimise the potential environmental impacts through careful design, master planning and mitigation measures as described in various chapters of this EIA Report. Various other objectives of the County Development Plan as outlined throughout this EIA Report (see Chapter 11) relate to the protection of amenity and the environment of the Grand Canal (pNHA).

5.18 Specific details of potential impacts in relation to these resources are dealt with in the relevant chapters within this EIA Report. In conclusion it can be stated that the Proposed Development complies fully with the stated requirements of SDCC and will be a strategic asset in the continued economic development and growth of the Dublin area.

Population

5.19 The Proposed Development site is located within the north-eastern corner of the Newcastle Electoral Division and immediate west of the Clondalkin-Dunawley Electoral Division which extends to the south of the Canal to Clondalkin to the east. Both ED's form part of the Clondalkin Local Electoral Area which is made up of lands that lie almost wholly to the west of the M50, and extend to beyond Rathcoole and Saggart to the south-west; and beyond Lucan and Newcastle to the north.

5.20 The most recent Census for which data is available in 2016 indicated that the population of the Newcastle Electoral Division was estimated at 11,358 (table 5.1). This represents a 13.6% increase in

population between 2011 and 2016. This followed a very significant increase in population levels of 42.5% between 2006 and 2011. This compares to the 4.4% increase in the population of the Clondalkin-Dunawley Electoral Division (ED) between 2011 and 2016 and near static population between the previous Censal dates. It is notable that there was a lack of substantial new housing development in this area during this period and that the change in population relates more to changes to household composition during this period.

Table 5.1 Population levels in the study area in 2006, 2011 and 2016

	2006	2011	2016	% change 2006 - 2016
Newcastle ED	2,631	3,749	4,257	+61.8%
Clondalkin-Dunawley ED	10,873	10,877	11,358	+4.4%
South Dublin CC	246,935	265,205	278,767	+12.9%
Leinster	2,295,123	2,504,814	2,634,403	+14.8%
State	4,239,848	4,588,252	4,761,865	+12.3%

5.21 The West Dublin area underwent very high levels of population growth during the early 2000s, although this happened primarily outside of the immediate environs of the application site. This growth, which is more similar to County and Regional levels, is evident in new suburban areas to the north and south that were constructed around the western fringes of Dublin during this period. The very small population increase within the ED is indicative of the fact that there is very little undeveloped residentially zoned land within the ED and that the western part of the ED is covered by the Grange Castle Business Park and similarly zoned land for employment based development.

5.22 The population of the administrative area of South Dublin, has by comparison increased by 12.9% between 2006 and 2016. West Dublin underwent very high levels of population growth during the economic boom of the early 2000s, although this happened primarily outside of the immediate environs of the application site. This growth, which is more similar to County and Regional levels. is evident in new suburban areas to the north and south that were constructed around the western fringes of Dublin during this period as well as Newcastle to the west.

5.23 There is very little population close to the subject site to provide any guide to trends in population. This is reflective of the fact that there is very little undeveloped residentially zoned land within the ED and that the western part of the ED that is covered by the Grange Castle Business Park and similarly zoned land for employment based development.

Employment

5.24 The economic conditions in Ireland that stemmed from 2008 resulted in higher unemployment levels over the following six years although this has decreased subsequently, up until the recent Coronavirus outbreak. The number of persons on the Live Register of unemployment fell in the State from 428,876 in February 2013 to 356,112 in December 2014 and subsequently dropped to 119,900 in February 2020. It is noted that the number of persons on the Live Register of unemployment in January 2021 was 188,543 (including seasonal adjustments this increased to 190,500). Note that this figure does not include those persons on the range of support measures/payments which were put in place in response to the Coronavirus pandemic. The Coronavirus pandemic has resulted in a significant and sudden increase in unemployment. The long term implications on employment across the State and in Dublin at the time of making the application are unclear.

5.25 The number of persons on the Live Register of unemployment fell in Dublin from 102,591 in February 2013, and has continued to decrease since then, with some seasonal fluctuations, and was 57,284 in February 2018; and had dropped to 44,218 in February 2020 and has increased to 47,937 in January 2021. This figure does not include those persons on the range of support measures/payments which were put in place in response to the Coronavirus pandemic.

Table 5.2 At work by industry type 2011 and 2016 (source: CSO, 2006, 2011 and 2016)

	Year	Newcastle ED	Clondalkin-Dunawley ED	Clondalkin Local Electoral Area
Agriculture	2011	30	5	78
	2016	26	4	65
Construction	2011	126	162	1,034
	2016	127	244	1,283
Manufacturing	2011	223	405	2,343
	2016	198	429	2,280
Commerce	2011	483	1,051	6,144
	2016	523	1,117	6,065
Transport	2011	171	423	2,383
	2016	193	442	2,434
Public administration	2011	163	25	1,316
	2016	154	195	1,184
Professional services	2011	322	799	4,552
	2016	381	950	4,778
Other	2011	230	738	3,949
	2016	319	1,008	5,064
Total at work	**2011**	**1,748**	**3,808**	**21,799**
	2016	**1,921**	**4,389**	**23,153**

5.26 The changes in persons in work, labour force and unemployed within the wider study area as outlined in Table 5.2 is indicative of the change in the economic circumstance that has been experienced across the State since 2008, up until the Coronavirus pandemic, and the significant improvements over the last seven years. It is notable however that the increase in unemployment was significantly more marked within the wider local area, although this may have been rectified in the five years since the most recent Census although the Coronavirus pandemic will have significantly altered this.

5.27 In relation to employment type the CSO Newcastle ED figures for 2006, 2011 and 2016 indicate that employment particularly in building and construction as well as agriculture, forestry and fishing have reduced during the Census periods 2006 to 2016. In terms of manufacture the figures show an increase in numbers between 2006 and 2011 followed by a reduction in those employed in that particular sector. It is also notable that employment in commerce and trade, transport and communications, public administration, professional services and other areas (non-stated within the CSO data) have continued to increase during each census period. This trend continued since the last Census of 2016, based on the continuing decrease in the number of people on the Live Register up until March 2020, but is likely to have increased subsequently as a result of the pandemic (as per the recent January 2021 Live Register Figures referenced above)

Community facilities and amenity

5.28 The Proposed Development will be located on the periphery of a largely built up urban area where industrial activities are the main activity. Tourism is not a major industry in the immediate environs of the site. The wider area does contain a small number of hotels and other tourist accommodation (B&B's etc.) which generally increases towards the east in the direction of Dublin city and its many tourist sites. The Lucan Sarsfield GAA pitches lie to the north of the canal off the newly realigned R120 within 40m of the northern Proposed Development boundary with their clubhouse 150m from this boundary; and the Lucan pitch and putt course is located 150m to the north-east of the north-east corner of the site.

5.29 In terms of landscape amenity, SDCC recognise that the landscape, natural heritage and amenities of South Dublin have an important role to play in contributing to a high quality of life for residents and a positive experience for visitors. The primary area of landscape amenity in the vicinity of the site is the Grand Canal that bounds the northern edge of the site and is c. 10-15m from the northern boundary of the site and 90-110m from the nearest part of the Proposed Development. The amenity value of the canal is recognised by both SDCC and Waterways Ireland and other organisations in that it provides a key amenity link between the city centre and the suburbs and beyond. The impact on this tourism and amenity resource has been considered as part of this assessment. Further discussion of impact on landscape amenity is presented in Chapter 11: Landscape and Visual Impact.

5.30 Residential development is primarily located to the immediate east and to the immediate north-east of the subject site and are almost entirely located on the east side of the Adamstown / Newcastle Road (R120) apart from the house immediately bounding the overall site to the north-east. There are several residential properties bounding the east side of the R120 facing the application site that are c. 40-50m from the eastern boundary of the site. There are no occupied residential properties within the site. Both the derelict and abandoned residential property within the site are proposed to be demolished as part of the Proposed Development.

5.31 There are a number of other residential properties to the north of the canal. A traveller site is located some 180m to the south-west of the site. The western edges of Clondalkin are located some distance to the east. The extended Clonburris SDZ and other residentially zoned land extend down to the immediate north-east of the subject site and canal. The potential impact on these undeveloped lands and existing communities and population has been addressed within the EIA Report.

5.32 The population of the surrounding areas is serviced by schools in the surrounding areas of Newcastle, Clondalkin, Lucan, Tallaght and Rathcoole. The Clonburris SDZ has identified lands to the north of the canal for the expansion of the SDZ that is currently being considered by An Bord Pleanála as to their future use within the SDZ.

5.33 The nearest hospital to the facility is located at the Adelaide and Meath Hospital incorporating the National Children's Hospital, Tallaght, Dublin 24. There is a Garda station in Clondalkin and fire station at Belgard Road, Tallaght, Dublin 24. Grange Castle Business Park has 24 hour on site security to the immediate east.

5.34 Local and regional bus services connect the local and wider area with Dublin city centre. The Dublin to Cork mainline railway passes to the north of the site. A new station at Adamstown and at Fonthill provide a new commuter service into the city centre.

5.35 The Casement Air base and its associated buildings bound the Baldonnel Road some 3km to the south-east of the application site.

Characteristics of the Proposed Development

5.36 The Proposed Development is to develop 2 no. data centre facilities with associated ancillary facilities and infrastructure as well as three no. two storey gas powered Power Plants. A full description of the Proposed Development is set out in Chapter 2 of the EIAR.

Potential impacts of the Proposed Development

Construction phase

5.37 The construction of the Proposed Development will be phased based on customer demand over 3.5 years. The proposed data centres are proposed to be constructed over a 1.5 year period at the start of the overall construction period. Each of the Power Plants will be constructed, also based on customer demand over a rotating 0.5 year period based on the construction of the permitted and proposed data centres. This construction phase will depend on customer demand and it has been assumed as reflecting a worse-case scenario for the purposes of this EIAR. A shorter period of construction will result in different elements of the Proposed Development being constructed at the same time.

5.38 The Proposed Development will result in the creation of a construction site on a single stand-alone site that will have a potential short term negative impact on the immediate local environment, the amenity of existing residents, the amenity of recreational / sport facilities, and workers within nearby facilities. This will primarily occur during the 3.5 year construction period of the proposed data centre facilities and its associated ancillary elements.

5.39 The following temporary local impacts during the construction phase have the potential to affect the local population and amenity:

- increased vehicular traffic;

- increased noise, dirt and dust generation; and
- increased employment opportunities.

5.40 While temporary inconvenience may be caused to the existing population and amenity in the area as a result of construction, these impacts will be limited to the construction period. The population with greatest potential for construction impacts are the residential properties abounding the overall site to the north-east, traveller site to the south-west; those to the east along the R120; and to the north of the canal.

5.41 There will be ongoing noise disturbance as a result of construction traffic throughout the construction process although this will impact those properties closer to the construction entrance off the R120 rather than any others. The construction phase therefore is considered likely to have a ***slight*** but ***short-term negative impact*** during the 3.5 years construction period on the immediate local population and amenity of the area.

5.42 The Proposed Development will not result in any change to the permanent population of the area during the construction phase.

5.43 There is potential for a resultant increase in the temporary population of the area as a result of the employment of workers from outside the wider Dublin area that may choose to reside in the immediate and wider local area during the construction period. This is likely to amount to only a small percentage of the workforce employed during the construction phase but will result in some additional trade for local accommodation and services.

5.44 It is expected that the majority of the work force will travel from existing places of residence to the construction site rather than reside in the immediate environs of the site. However, some local employment from within the wider local area is expected. The potential for this is increased due to the 3.5 year construction process.

5.45 The main construction phases of the Proposed Development will each take approximately c.1.5 years, and 0.5years respectively for each Power Plant, and will generate construction employment directly on-site. It is expected that the maximum employment will be 250, on average 150 people will be employed during the construction stage.

5.46 Construction will benefit support industries such as building suppliers and local services. There will also be a need to bring in specialist workers on a regular basis that may increase the above estimated working population at times. Specialists are only likely to stay for shorter periods depending on the nature of the work. The construction phase will have the potential to have a ***moderate short-term positive impact*** on the economy and employment of the local and wider area.

5.47 There are many potential health and safety risks arising from the construction phase due to the use of large, mobile machinery and heavy equipment and materials. Mitigation measures which will be taken to reduce these risks are described on the following page.

5.48 Local community facilities are likely to be used more regularly as a result of the temporary working population resident in the local area. The impact on such facilities is likely to be ***imperceptible***.

5.49 Human health has the potential to be impacted by the construction process as a result of dust and other air pollutants even on a short-term perspective. This is outlined in more detail within Chapter 10 (Air Quality and Climate).

5.50 The application of limits on noise and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum. In addition, due to the distance between the site and the nearest sensitive locations, vibration impacts generated during construction are expected to be negligible. Therefore, the noise and vibration impact of the construction phase of the Proposed Development is likely to be ***temporary to short-term*** and ***slightly negative*** with respect to human health because of the temporary short-term of such impacts during the construction phase.

Operational phase

5.51 The nature of the proposed land use will facilitate the creation of a more intensive use of these lands that are currently primarily greenfield and the site of 1 no. abandoned and 1 no. derelict residential dwelling and associated ancillary buildings. The Proposed Development will not result in a decrease in the permanent population of the area but will result in a reduction of dwellings in the area.

5.52 The Proposed Development (post construction) will help to sustain c. 100 jobs that will be spread across the three shift operating times of the development with the majority working during the two day shifts of the data centre's office space and ancillary elements, including the maintenance of the Power Plants. It is estimated that c. 100 people will be employed on 3 shifts (with an estimated attendee level of 80 during the two day shifts and 20 during the night shift (12am – 8am); with other support staff coming in now and again as necessary. Some of the staff may move into the local area to be closer to their place of employment and therefore increasing the demand for housing within the wider local area. The facility will also attract a significant level of additional support services and therefore employers and employees into the area. In this regard, the development has the potential to generate some local employment through support services.

5.53 Mitigation design measures will ensure that the Proposed Development has been designed to the highest standard with safety as a key priority so there will be little risk of fires or other related events that may impact upon human health.

5.54 There are a range of local amenities in the area that include the Newcastle Golf Centre, Grange Castle Golf Course as well as other golfing facilities. The Grand Canal Way that is used for boating, fishing and walking as well as being an important ecological resource and habitat is immediately adjoining the wider site to the north.

5.55 The Proposed Development has the potential to have a long-term and negative impact on the amenity of the residential dwellings adjoining the subject site as well as the amenity of the Grand Canal. The increased planting and the separation distances to existing adjoining residential dwellings and green infrastructure, particularly to the north of the site, as well as noise attenuation and overall master planning of the site, will ensure that the development will not be detrimental to human health.

5.56 The 2014 EIA Directive, 2018 EIA Regulations and associated EPA Draft EIA Report Guidelines 2017 require that the vulnerability of the project to major accidents and/or natural disasters (such as earthquakes, landslides, flooding, sea level rise etc.) is considered in the EIA Report. The site has been assessed in relation to the following external natural disasters; landslides, seismic activity, volcanic activity and sea level rise/flooding as outlined below. The potential for major accidents to occur at the facility has also been considered with reference to Seveso/Control of Major Accident Hazards (COMAH) Regulations. There is a negligible risk of landslides occurring at the site and in the immediate vicinity due to the topography and soil profile of the site and surrounding areas. There is no history of seismic activity in the vicinity of the site. There are no active volcanoes in Ireland so there is no risk of volcanic activity.

5.57 The potential risk of flooding on the site was also assessed. A Stage 1 Flood Risk Assessment was carried out and it was concluded that the development is not at risk of flooding. Furthermore, the Proposed Development design has adequate attenuation etc. to ensure there is no potential impact on flood risk for other neighbouring properties, nor is the site at risk from sea level rise.

5.58 The Proposed Development will not be a Seveso/COMAH facility. The only substance stored on site controlled under Seveso/COMAH will be diesel for generators and the amounts proposed do not exceed the relevant thresholds of the Seveso Directive. There is a potential impact on the receiving environment as a result of minor accidents/leaks of fuel/oils during the construction and operational phases. However, the implementation of the mitigation measures set out in Chapter 7 (Land, Soils, Geology and Hydrogeology) and Chapter 8 (Hydrology) of the EIA Report will ensure the risk of a minor/accident is low and that the residual effect on the environment is imperceptible.

5.59 The Proposed Development will require additional electrical power supply in the short-term from the Power Plants and in the medium / long term from the national grid and the requirements for this supply have been detailed in Chapter 2 and Chapter 15 (Material Assets). The implementation of mitigation measures outlined in Chapter 15 will ensure there will be no impact on power supply to local residential or business users.

5.60 As detailed in Chapter 9, noise modelling was undertaken to assess the impact of the Proposed Development of the site with reference to noise limits typically applied by SDCC, ABP and the EPA. As demonstrated by the modelling results, the predicted noise emissions associated with the Proposed Development of the site during the operational phases are compliant with the adopted noise limit values which are based with due consideration of the effect on human health. Furthermore, any change in noise levels associated with additional vehicles at road junctions in the vicinity of the Proposed Development is expected to be imperceptible. In essence, the noise levels that are encountered at the nearest noise sensitive locations are predicted to be within relevant noise criteria that have been adopted here for the operation of the proposed data centre and associated infrastructure. These criteria have been selected with due consideration to human health, therefore, will not result in a significant impact on human health. The Proposed Development will not generate any perceptible levels of vibration during operation and therefore there will be no impact from vibrations on human health.

Remedial and mitigation measures

Construction phase

5.61 The Proposed Development does not have the potential to result in any significant negative impacts on population and community during the course of construction. Any perceived negative impacts on the immediate local population will be short-term and temporary in nature due to the worst case 3.5 year construction process for the Proposed Development. No remedial or reductive measures are therefore required beyond normal landscaping, noise and construction mitigation that are outlined elsewhere within this EIA Report and should form a condition of permission.

5.62 In accordance with the Safety, Health, and Welfare at Work (Construction) Regulations, a safety management system will be put in place on-site to minimise any risks to both construction personnel and site visitors. The site will not be accessible to the public and will have strict procedures in place for allowing entrance to visitors and contractors.

5.63 Traffic mitigation measures proposed to reduce the impact of additional traffic movements to and from the development are set out under Chapter 12 of the EIA Report. Mitigation measures proposed to minimise the potential impacts on human health in terms of noise and vibration are discussed in Chapter 9 of the EIA Report.

5.64 Best practice mitigation measures are proposed for the construction phase of the Proposed Development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the Proposed Development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the Proposed Development is likely to be ***short to medium term and imperceptible*** with respect to human health.

5.65 ***No adverse impacts*** relating to employment are predicted during the construction phase. Impacts on employment will be ***positive if only slight*** within the immediate local area. Therefore no remedial or reductive measures are considered necessary.

Operational phase

5.66 No remedial or mitigation measures are considered necessary, beyond the landscaping proposed and detailed in Chapter 11 of this EIA Report; as well as Traffic, Air Quality and noise mitigation, as the Proposed Development will not give rise to any adverse impacts on population, and amenity nor human health during the operational phase of the Proposed Development. The development will result in the creation of a significant number of new jobs especially in service activities and creation of some local jobs. This is considered a ***slight permanent positive impact*** of the Proposed Development. No remedial or reductive measures are therefore required.

Residual impacts

Construction phase

5.67 The construction phase of the Proposed Development will result in the creation of a large construction site that will have a short to medium term and slight negative impact on the immediate local environment and the amenity of existing residents as a result of noise and disturbance during construction. The nearest residential properties at the north-eastern boundary and to the east and south-west of the subject site will have ongoing noise disturbance as a result of construction activity and traffic, in relation to the properties along the R120, throughout the construction process.

5.68 The construction phase of the development therefore is considered likely to have a ***slight*** but ***short term negative impact*** on the local community, human health and population.

5.69 The Proposed Development will not result in any material change to the permanent population of the area during the construction phase. There will be an increase in the temporary population of the area as a result of the employment of workers from outside the wider Dublin area that may need to reside in the immediate local area during the construction process. This will amount to only a small percentage of the workforce employed during the construction phases of the scheme but will result in some additional trade for local accommodation and services.

5.70 The majority of the work force will travel from existing places of residence to the construction site rather than reside in the immediate environs of the site. However, some local employment from within the wider local area is expected.

5.71 The total on-site construction phase of the development will be approximately 3.5 years. During the phased development of the construction of the proposed data centre facilities and Power Plant elements, it is expected that an average of 150 people will be employed during this main phase of construction. This is likely to benefit suitably qualified members of the local community, as well as others. The development will also support job creation in associated sectors such as building supply and local services.

5.72 Community facilities will be used more regularly as a result of the temporary working population resident in the local area. The construction phase therefore is predicted to have a ***slight short-term positive impact*** on the economy and employment of the area but a ***short-term slight negative impact*** on the local community and amenity of the area.

Operational phase

5.73 The operation of the proposed facility will be carried out in strict accordance with all Irish and European regulations governing safety in the work place with specific regard to the regulations implemented under the Safety, Health & Welfare at Work Act, 2005.

5.74 The Proposed Development will facilitate the creation of a more intensive use for the lands that are located to the west of the original Grange Castle Business Park, and to the north-east of the western expansion of the business park. The Proposed Development will upon completion sustain in the region of c.100 workers. Based on the social class profile of the local community, a small number of the local population in the hinterland of the Proposed Development site are predicted to benefit from the new employment, which will be created. This is a ***slight and long-term positive impact***. Some additional employment will also be created in support services including building maintenance, cleaning and catering services. The impact on the amenity of the Grand Canal is viewed as being neutral given the mitigation proposed.

Cumulative impacts

5.75 As the permitted data centre has the potential to be built at the same time as both the proposed data centre and one or more of the Power Plants, the cumulative effect in terms of employment will moderate, short term but positive in nature. There is no significant cumulative effect associated with the Proposed Development, the permitted development and future cabling works, on human health.

5.76 The Proposed Development will create up to 100 jobs once in operation. These with other jobs being created by the permitted data centre development, and potential future data centre on the site, will have a ***slight, long term positive*** impact on employment in the area.

5.77 As demonstrated by the noise modelling results presented in Chapter 9 - Noise and Vibration, the predicted cumulative noise emissions associated with the Proposed Development and Permitted Development during the operational phases are compliant with the adopted day and night time noise limit values that are set out in Chapter 9 – Noise and Vibration that have taken due consideration of the effect on human health.

5.78 Furthermore, any change in noise levels associated with additional vehicles during the Operational Phase at road junctions in the vicinity of the Proposed Development will be imperceptible due to the low level of traffic the Proposed Development in combination with other projects will generate. In essence, the noise levels that are encountered at the nearest noise sensitive locations will be within relevant noise criteria as set out in Chapter 9.

5.79 The cumulative effect of the Proposed Development; and the permitted development have been described in Chapter 10 - Air Quality and Climate. Air dispersion modelling was undertaken to assess the cumulative effect with reference to EU ambient air quality standards which are based on the protection of human health.

5.80 As demonstrated by the air dispersion modelling results, emissions from the Proposed Development; and the Permitted Development, assuming scheduled testing as well as emergency operation of the diesel back-up generators and the more permanent gas based Power Plant generators relating to the Proposed Development as outlined in Chapter 10, will be compliant with all National and EU ambient air quality limit values and, therefore, will not result in a significant effect on human health.

5.81 There is no predicted significant cumulative effect on population and human health associated with the construction or operational phase of the Proposed Development when it is considered with the Permitted Development already granted on site and future cabling works and other plans or projects, once appropriate mitigation measures as set out under this Chapter of the EIA Report are put in place for the development. As the Proposed Development will have a positive effect on the immediate hinterland and the Dublin Region resulting from increased employment and the associated economic and social benefits, it is concluded that once appropriate mitigation measures are put in place any cumulative effects on population and human health will be ***positive*** and ***long-term*** and ranging from ***imperceptible*** to ***slight***.

6. BIODIVERSITY

6.1 This Biodiversity Chapter for the Environmental Impact Assessment Report (EIAR) was authored by Alexis FitzGerald of Scott Cawley Ltd. This Chapter provides an assessment of the potential impacts of the Proposed Development on the local ecology. The site is located on farmland just west of the existing EdgeConneX data centre site, Newcastle Road, in the townlands of Ballymakaily and Adamstown in west Co. Dublin (refer to Figure 6.1 for the location of the Proposed Development site). The Proposed Development consists of a data centre development, with associated landscaping, lighting and drainage. A detailed description of the Proposed Development is included in Chapter 2 of the EIAR.

6.2 The subject lands are located west of Dublin city, just south of the Grand Canal which flows eastwards along the northern margin of the site. The lands are mostly comprised of areas of managed grassland, hedgerows, treelines and some small areas of hardstanding. The hardstanding areas within the Proposed Development site comprise farm buildings at the northern margin of the site and associated paved areas and roads. The adjacent lands and wider environs are largely agricultural in nature to the north, south and west, and largely commercial/industrial in nature to the east.

6.3 The Proposed Development will be built on the existing managed grassland and hedgerow habitat and hardstanding ground. The location of the Proposed Development site in relation to the surrounding environment is presented below in Figure 6.1.

Figure 6.6 Proposed development site in the context of the surrounding environment.

Aims

6.4 The purpose of this chapter is to:

- Establish and evaluate the baseline ecological environment, as relevant to the Proposed Development
- Identify, describe, and assess all potentially significant ecological impacts associated with the Proposed Development
- Set out the mitigation measures required to address any potentially significant ecological impacts and ensure compliance with relevant nature conservation legislation
- Provide an assessment of the significance of any residual ecological impacts
- Identify any appropriate compensation, enhancement, or post-construction monitoring requirements

6.5 A separate stand alone Appropriate Assessment (AA) screening (Scott Cawley Ltd., 2021) has been prepared and is being submitted as part of the planning application documentation. The AA Screening

report contains information relevant to the competent authority's assessment of potential impacts that may arise from the Proposed Development on any European site.

Planning, Policy and Legislation

6.6 The collation of ecological baseline data and the preparation of this assessment has had regard to the following legislation and policy documents. This is not an exhaustive list but the most relevant legislative and policy basis for the purposes of preparing this biodiversity chapter. The following international legislation is relevant to the Proposed Development:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora; hereafter, referred to as the 'Habitats Directive'. The Habitats Directive is the legislation under which the Natura 2000 network[1] was established and special areas of conservation (SACs) are designated for the protection of natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of that directive.
- Directive 2009/147/EEC; hereafter, referred to as the 'Birds Directive'. The Birds Directive is the legislation under which special protection areas are designated for the protection of endangered species of wild birds listed in Annex I of that directive.
- Directive 2000/60/EC; hereafter, referred to as the 'Water Framework Directive'. The Water Framework Directive is a piece of legislation adopted with the aim of attaining good status in all water bodies (rivers, lakes, groundwater and transitional (estuarine) and coastal waters) that are of lesser status at present and retaining good status or better where such status exists at present, throughout the EU. As part of this aim, the legislation requires the establishment of two primary monitoring programmes for water bodies: the Surveillance Monitoring (SM) and the Operational Monitoring (OM) networks for surface waters and groundwater.

6.7 The following national legislation is relevant to the Proposed Development:

- Wildlife Acts 1976 to 2020; hereafter collectively referred to as the 'Wildlife Acts'. The Wildlife Acts are the principal pieces of legislation at national level for the protection of wildlife and for the control of activities that may harm wildlife. All bird species, 22 other animal species or groups of species, and 86 species of flora are protected under this legislation.
- Planning and Development Acts 2000 to 2021; hereafter collectively referred to as the 'Planning and Development Acts'. This piece of legislation is the basis for Irish planning. Under the legislation, development plans (usually implemented at local authority level) must include mandatory objectives for the conservation of natural heritage and for the conservation of European Sites. It also sets out the requirements in relation to environmental assessment with respect to planning matters, including transposition of the Habitats and Birds Directive into Irish law.
- European Communities (EC) (Birds and Natural Habitats) Regulations 2011 to 2015; hereafter the 'Birds and Habitats Regulations'. This legislation transposes the Habitats and Birds Directives into Irish law. It also contains regulations (49 and 50) that deal with invasive species (those included within the Third Schedule of the regulations).
- Flora (Protection) Order, 2015. This lists species of plant protected under Section 21 of the Wildlife Acts.

6.8 The following plans and policies are relevant to the Proposed Development:

- All-Ireland Pollinator Plan 2015-2020 (National Biodiversity Data Centre, 2015)
- South Dublin County Development Plan 2016-2022 (South Dublin County Council, 2016)
- National Biodiversity Action Plan 2017-2021 (Department of Culture Heritage and the Gaeltacht, 2017)

[1] The Natura 2000 network is a European network of important ecological sites, as defined under Article 3 of the Habitats Directive 92/43/EEC, which comprises both special areas of conservation and special protection areas. Special conservation areas are sites hosting the natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of the Habitats Directive, and are established under the Habitats Directive itself. Special protection areas are established under Article 4 of the Birds Directive 2009/147/EC for the protection of endangered species of wild birds. The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats.
In Ireland these sites are designed as European sites - defined under the Planning Acts and/or the Birds and Habitats Regulations as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

- Draft Biodiversity Action Plan for South Dublin County 2020-2026 (South Dublin County Council, 2020). This lists South Dublin County's objectives and actions in relation to biodiversity within the county boundary and how they align with those listed in National Biodiversity Action Plan 2017-2021 (National Parks and Wildlife Service (NPWS), 2017).

Methodology

Scope of the Assessment

6.9 The study area is defined by the Zone of Influence (ZoI) of the Proposed Development with respect to the ecological receptors that could potentially be affected. The ZoI, or distance over which potentially significant effects may occur, will differ across the Key Ecological Receptors (KERs), depending on the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken has established the habitats and species present within, and in the vicinity of, the Proposed Development site. The ZoI and study area was then informed and defined by the sensitivities of each of the KERs present, in conjunction with the nature and potential impacts associated with the Proposed Development.

6.10 The ZoI of habitat loss impacts is confined to within the Proposed Development boundary. The ZoI of potential impacts on surface water quality in the receiving environment extends downstream to freshwater, estuarine and coastal ecosystems associated with waterbodies that are hydrologically connected to the Proposed Development via the Pitchfordstown stream, which is located along the north-western boundary.

6.11 The ZoI of air quality effects related to dust deposition is likely to be located within and/or adjacent to the Proposed Development site boundary. The ZoI of general construction activities (*i.e.* risk of spreading/introducing non-native invasive species, dust deposition and disturbance due to increased noise, vibration, human presence and lighting) is not likely to extend more than several hundred metres from the Proposed Development.

Desk Study

6.12 A desk study was undertaken on the 25th January 2021, to collate any available information on the local ecological environment. The following resources assisted in the production of this report, in addition to those listed in the Reference section of this report:

- Data on European sites, Natural Heritage Areas (NHAs) or proposed Natural Heritage Areas (pNHAs) as held by the National Parks and Wildlife Service (NPWS) from https://www.npws.ie/protected-sites and https://www.npws.ie/maps-and-data – refer to Appendix 6.1 and Figure 6.8 and Figure 6.9 for descriptions and locations of protected sites in the vicinity of the Proposed Development
- Records of rare and protected species, as held by the National Biodiversity Data Centre www.biodiversityireland.ie within c.2km of the Proposed Development site, or the NPWS within the same grid square (O03) in which the Proposed Development site is located in – refer to Appendix 6.2 for all desk study flora and fauna records
- Spatial information relevant to the planning process including land zoning and planning applications from Department of Housing Planning, Community and Local Government web map portal. Available from https://myplan.ie/
- Ordnance Survey Ireland mapping and aerial photography from www.osi.ie;
- Data on waterbodies, available for download from the Environmental Protection Agency (EPA) web map service. Available from https://gis.epa.ie/EPAMaps/
- Information on soils, geology and hydrogeology in the area available from the Geological Survey Ireland (GSI) online Spatial Resources service. Available from https://www.gsi.ie/en-ie/data-and-maps/Pages/Groundwater.aspx;
- Information on local biodiversity policies and objectives within the South Dublin County Development Plan 2016-2022 (South Dublin County Council, 2016);
- Information on the location, nature and design of the Proposed Development supplied by the applicant's design team;

- Information on the conservation status of birds in Ireland from Birds of Conservation Concern in Ireland[2]; and
- Information from previous Scott Cawley surveys in this site.

Consultation

6.13 Consultation letters were submitted by email to the Development Applications Unit of the Department of Culture, Heritage and the Gaeltacht on the 25th January 2020 (DAU Ref: G Pre 00014/2021). The letters included an outline description of the Proposed Development and a request for any comments on the proposal. No response from either authority was received by Scott Cawley Ltd. prior to submission of the planning application for the Proposed Development.

6.14 Inland Fisheries Ireland were also contacted on the 25th January 2020 to request additional data on species which may use the Griffeen River and for any comments they may have on the proposal. No response was received by Scott Cawley Ltd. prior to submission of the planning application for the Proposed Development.

Field Survey Methodology

6.15 Surveys for habitats, protected, rare and invasive flora, terrestrial mammals (including bats) and amphibians and reptiles, as well as ground-level assessments of trees and structures with respect to their suitability for roosting bats, as well as nesting birds, were undertaken on the 26th January 2021 by Alexis FitzGerald B.A. (Hons) MSc and Síofra Quigley BSc (Hons) MSc of Scott Cawley Ltd. Bat activity surveys were also undertaken in the northern portion of the lands near to the Grand Canal on 29th August and 19th September 2019 by Shane Brien BSc (Hons) M.Sc. of Scott Cawley Ltd.

Habitats and Flora Survey

6.16 A habitat survey was undertaken at the Proposed Development site following the methodology described in *Best Practice Guidance for Habitat Survey and Mapping*[3]. All habitat types were classified using the *Guide to Habitats in Ireland*[4], recording the indicator species and abundance using the DAFOR scale[5] and recording any species of conservation interest. Vascular and bryophyte plant nomenclature generally follow that of the National Vegetation Database[6], having regard to more recent taxonomic changes to species names after the *New Flora of the British Isles*[7] and the British Bryological Society's *Mosses and Liverworts of Britain and Ireland: A Field Guide*[8].

Fauna Surveys

Terrestrial Mammals (Excl. Bats)

6.17 The presence and absence of terrestrial fauna species were surveyed through the detection of field signs such as tracks, markings, feeding signs, and droppings, as well as by direct observation. The habitats on site were assessed for signs of usage by protected and red-listed fauna species, and their potential to support these species. Surveys included checks for the presence of badger setts within the subject lands, and to record any evidence of use.

Wintering birds

6.18 Wintering bird surveys were undertaken on the 22nd November 2018. Birds were identified by sight, and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes.

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[2] Colhoun, K., and Cummins, S. (2013) Birds of Conservation Concern in Ireland 2014-2019. Irish Birds 9: 523-544 (2013).
[3] Smith, G.F., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping.* The Heritage Council Church Lane, Kilkenny, Ireland.
[4] Fossitt, J.A. (2000) *A Guide to Habitats in Ireland.* Heritage Council, Kilkenny.
[5] The DAFOR scale is an ordinal or semi-quantitative scale for recording the relative abundance of plant species. The name DAFOR is an acronym for the abundance levels recorded: Dominant (D), Abundant (A), Frequent (F), Occasional (O) and Rare (R).
[6] Weekes, L.C. & FitzPatrick, Ú. (2010) *The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Ireland.* Version 1.0. Irish Wildlife Manuals. No. 49. National Parks and Wildlife Service. Department of Environment, Heritage and Local Government, Dublin, Ireland.
[7] Stace, C. (2019) *New Flora of the British Isles.* 4th Edition. C&M Floristics.
[8] Atherton, I., Bosanquet, S. & Lawley, M. (2010) *Mosses and Liverworts of Britain and Ireland: A Field Guide.* Latimer Trend & Co., Plymouth.

Bats

6.19 A ground-level assessment of all trees and structures within the subject lands, to examine their suitability to support roosting bats and potential to act as important landscape features for commuting and foraging bats, was completed. The assessment of structures included external inspections, as well as internal inspections where it was deemed safe and the buildings were unoccupied, in line with general and Covid-19 safety guidelines. The assessment was based on guidelines (see Table 6.1) in *Bat Surveys for Professional Ecologists: Good Practice Guidance*[9] and included inspections of trees and structures for potential roost features (PRFs), and for signs of bats (staining at roost entrances, droppings, carcasses, insect remains).

Table 6.1 Guidelines for assessing the potential suitability of Proposed Development sites for bats, based on the presence of habitat features within the landscape, applied according to professional judgement (Taken from Collins (2016)[11]).

Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitats. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, treelined watercourses and grazed parkland. Site is close to and connected to known roosts.

6.20 Two separate bat activity surveys were undertaken within the lands by surveyors who are experienced in bat transect surveys. The surveys were designed with reference to methodologies in *Bat Surveys for Professional Ecologists: Good Practice Guidelines*[9], and survey details are provided in Table 6.2. Surveys involved completion of a walked transect within the Proposed Development site and bat activity was recorded using a handheld bat detector (Batlogger-M). Recordings collected in the field were analysed using specialist sound analysis software (Elekon BatExplorer) to aid in the identification of bat species by their calls, (where this was possible), using professional judgement and with reference to *British Bat Calls: A Guide to Species Identification*[10].

[9] Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.

[10] Russ, J. (2012) *British Bat Calls: A Guide to Species Identification.* Pelagic Publishing, Exeter, United Kingdom. ISBN 978-1-907807-25-1.

Table 6.2: Details of bat surveys undertaken within the Proposed Development site.

Date	Survey Time (Sunset)	Survey Type	Surveyor(s)
29/08/2019	20:07-21:52 (20:22)	Dusk Activity Survey	Scott Cawley Ltd.
19/09/2019	19:16-21:01 (19:31)	Dusk Activity Survey	Scott Cawley Ltd.

6.21 Four static bat detectors (SM2) were also deployed on site from 22nd November to 12th December 2018 to record bat activity for a total of 20 nights.

Amphibians and Reptiles

6.22 An assessment of habitat suitability for amphibians and reptiles was completed. Suitable habitat for amphibians, such as ponds and wet ditches, and for reptiles, such as stone walls, rocks or logs suitable for basking, were recorded and mapped, as well as any direct observations of individuals.

Ecological Evaluation and Impact Assessment

Ecological Evaluation

6.23 Ecological receptors (including identified sites of ecological importance) are valued with regard to the ecological valuation examples set out in *Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2*[11] and the guidance provided in *Guidelines for Ecological Impact Assessment in the UK and Ireland*[12] – refer to Appendix 6.3 for examples of how ecological importance is assigned. In accordance with these guidelines, important ecological features within what is referred to as the Zone of Influence (ZoI) of the Proposed Development which are "both of sufficient value to be material in decision making and likely to be affected significantly" are deemed to be 'Key Ecological Receptors' (KERs). These are the ecological receptors which may be subject to significant effects from the Proposed Development, either directly or indirectly. KERs are those biodiversity receptors with an ecological value of local importance (higher value) or greater.

Impact Assessment

6.24 Ecological impact assessment is conducted following a standard source-pathway-receptor model, where, in order for an impact to be established all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism is sufficient to conclude that a potentially significant effect would not occur.

- Source(s) – e.g. pollutant run-off from proposed works
- Pathway(s) – e.g. groundwater connecting to nearby qualifying wetland habitats
- Receptor(s) – e.g. wetland habitats and the fauna and flora species they support

Characterising and Describing the Impacts

6.25 The parameters considered in characterising and describing the potential impacts of the Proposed Development are per the EPA's *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*[13] and CIEEM's *Guidelines for Ecological Impact Assessment in the UK and Ireland*: whether the effect is positive, neutral or negative; the significance of the effects; the extent and context of the effect; the probability, duration and frequency of effects; and cumulative effects.

6.26 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. The following development types are included in considering cumulative effects:

- Existing projects (under construction or operational)
- Projects which have been granted consent but not yet started
- Projects for which consent has been applied for which are awaiting a decision, including those under appeal

[11] NRA (2009) *Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2.* National Roads Authority.
[12] CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland.* Chartered Institute of Ecology and Environmental Management, Winchester, UK.
[13] Environmental Protection Agency. (2017) *Guidelines on the information to be contained in Environmental Impact Assessment Reports.* Draft, August 2017. (refer to Table 3.3)

- Projects proposed at a plan level, if relevant (e.g. future strategic infrastructure such as roads or greenways)

6.27 The likelihood of an impact occurring, and the predicted effects, is an important consideration in characterising impacts. In some cases, it may not be possible to definitively conclude that an impact will not occur. In these cases, the evaluation of significant effects is based on the best available scientific evidence but where reasonable doubt remains, then the precautionary principle is applied, and it may need to be assumed that significant effects may occur. Professional judgement is used in considering the contribution of all relevant criteria in determining the overall magnitude of an impact.

Significant Effects

6.28 In determining whether potential impacts will result in significant effects, the CIEEM guidelines were followed. The approach considers that significant effects will occur when there are impacts on either:

- the structure and function (or integrity) of defined sites, habitats or ecosystems; or
- the conservation status of habitats and species (including extent, abundance and distribution).

Integrity

6.29 The term "*integrity*" may be regarded as the coherence of ecological structure and function, across the entirety of a site that enables it to sustain all of the biodiversity or ecological resources for which it has been valued (National Roads Authority (NRA), 2009).

6.30 The term "*integrity*" is most often used when determining impact significance in relation to designated areas for nature conservation (*e.g.* SACs, SPAs or pNHA/NHAs) but can also be the most appropriate method to use for non-designated areas of biodiversity value where the component habitats and/or species exist with a defined ecosystem at a given geographic scale.

6.31 An impact on the integrity of an ecological site or ecosystem is considered to be significant if it moves the condition of the ecosystem away from a favourable condition: removing or changing the processes that support the sites' habitats and/or species; affect the nature, extent, structure and functioning of component habitats; and/or, affect the population size and viability of component species.

Conservation Status

6.32 Similar definitions for conservation status given in the EU Habitats Directive 92/43/EEC, in relation to habitats and species, are also used in the CIEEM (2018) and NRA (2009) guidance which are summarised as follows:

- For natural habitats, conservation status means the sum of the influences acting on the natural habitat and its typical species, that may affect its extent, structure and functions as well as its distribution, or the long-term survival of its typical species, at the appropriate geographical scale; and
- For species, conservation status means the sum of influences acting on the species concerned that may affect the abundance of its populations, as well as its distribution, at the appropriate geographical scale.

6.33 An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status, having regard to the definitions of favourable conservation status provided in the EU Habitats Directive 92/43/EEC – *i.e.* into the future, the range, area and quality of habitats are likely to be maintained or increased and species populations are likely to be maintained or increased.

6.34 According to the CIEEM methodology, if it is determined that the integrity and/or conservation status of an ecological receptor will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (*i.e.* local, county, national, international). In some cases, an impact may not be significant at the geographic scale at which the ecological feature has been valued but may be significant at a lower geographical level. For example, a particular impact may not be considered likely to have a negative effect on the overall conservation status of a species

which is considered to be internationally important. However, an impact may occur at a local level on this internationally important species. In this case, the impact on an internationally important species is considered to be significant at only a local, rather than an international level.

Receiving Environment

Designated Areas

European sites

6.35 Special Areas of Conservation (SAC) are designated under the EC Habitats Directive (92/43/EEC), which is transposed into Irish law through a variety of legislation including the Birds and Habitats Regulations and the Planning and Development Acts. The legislation enables the protection of certain habitats (listed on Annex I of the Directive) and/ or species (listed on Annex II). Special Protection Areas (SPAs) are designated under the Birds Directive (2009/147/EC). This allows for the protection of bird species on Annex I of the Directive, regularly occurring populations of migratory species (such as ducks, geese or waders), and important wetland habitats for birds.

6.36 The subject lands are not located within or adjacent to any European sites (see Figure 6.8). The closest European site is Rye Water Valley/Carton SAC (001398), located *c.*4.1km north-west, which has been designated for petrifying springs, Desmoulin's whorl snail *Vertigo moulinsiana* and narrow-mouthed whorl snail *Vertigo angustior.*

6.37 There are no major waterbodies within the Proposed Development site, however, a network of drainage ditches connects the site to the Lucan Stream to the west, and the Griffeen River to the east. The nearest waterbody to the Proposed Development site is the Ballymakaily Stream, c. 150m, east of the Proposed Development. It joins the Griffeen River, c. 330m, east from its origin. The Griffeen River (into which river the site primarily drains) flows c. 180m east of the Proposed Development and has the potential to hydrologically connect the Proposed Development site to European sites located downstream in Dublin Bay (see Figure 6.2). As it flows north it is joined by the Adamstown stream, c.1km downstream, the Laraghcon stream, c.3.4km downstream, and the Moat stream, c.3.5km downstream of the Proposed Development site, before it flows into the River Liffey, c.4km downstream of the Proposed Development site. Kilmahuddrick stream, not shown on the EPA maps, starts at the southern edge of the Griffeen Valley Park, before joining the Griffeen River, c. 330m north-west of its starting point in the park. The Griffeen River and the adjoining streams all have a '*Good*' WFD status and are listed as '*At risk*' waterbodies by the EPA.

6.38 The River Liffey is assigned a '*Good*' WFD status until it reaches Lucan village, located downstream of the Proposed Development site, where its WFD status is '*Unassigned*'. At Chapelizod, its WFD status is '*Moderate*'; however, it then changes to a '*Good*' WFD status before joining the Upper and Lower Liffey Estuary waterbodies at Islandbridge, c.15.5km downstream and east of the Proposed Development site. Both of these waterbodies have a '*Good*' WFD status and are listed as being '*At risk*' by the EPA.

6.39 The Grand Canal is located c.5-10m north of the Proposed Development boundary. It has a '*Good*' WFD status and is listed as being '*At Risk*' by the EPA. The Grand Canal joins the Lower Liffey Estuary c.16km downstream of the Proposed Development site, before flowing into Dublin Bay c.19km downstream from the Proposed Development site. Dublin Bay is considered to be '*Unpolluted*' with a '*Good*' WFD status and is considered to be '*Not at risk*'.

6.40 The Groundwater Body (GWB) underlying the site is the Dublin GWB, which is currently classified by the EPA as having '*Good Status*' and '*Not at risk*'. The Dublin GWB overlaps with only one European site that is designated for groundwater dependent terrestrial habitats and fauna species that are dependent on groundwater dependent terrestrial habitats, *i.e.* Rye Water Valley/Carton SAC, which is located c.4.1km north-west of the Proposed Development site.

Figure 6.7 Waterbodies in the vicinity of the Proposed Development.

6.41 There are six SACs and three SPAs within the vicinity of the Proposed Development and downstream in Dublin Bay as follows (see Figure 6.8):

- Rye Water Valley/Carton SAC (001398), located c.4.1km to the north-west, and designated for petrifying springs, Desmoulin's whorl snail and narrow-mouthed whorl snail.
- Glenasmole Valley SAC (001209), located c.9.8km to the south-east, and designated for grassland habitats and petrifying springs.
- Wicklow Mountains SAC (002122), located c.11.4km to the south, and designated for freshwater and upland habitats and otter *Lutra lutra*.
- North Dublin Bay SAC (000206), which is c.18.8km east of the Proposed Development site and designated for a range of coastal habitats, and populations of petalwort *Petalophyllum ralfsii*.
- Red Bog, Kildare SAC (000397), located c.15km south of the Proposed Development site and designated for its transition mire and quaking bog habitat.
- North Bull Island SPA (004006), which is c.15.7km east of the Proposed Development site and designated for a range of wintering wetland bird species.
- Wicklow Mountains SPA (004040), which is c.14.6km to the southeast, and designated for merlin *Falco columbarius* and peregrine *Falco peregrinus*.
- South Dublin Bay SAC (000210), which is c.16.4km east of the Proposed Development site and designated for dune and tidal habitats.
- South Dublin Bay and River Tolka Estuary SPA (004024), which is c.16.4km east of the Proposed Development site and designated for a range of wintering wetland bird species.

6.42 Full lists of the qualifying interests (QI) and special conservation interest (SCI) species of these European sites are presented in Appendix 6.1.

6.43 Based on the results of the desk study and the site walkover surveys, the subject lands contain very limited habitat for qualifying interest or special conservation interest species for which any European sites have been designated. The Griffeen River, into which river the lands drain, may be potentially used by qualifying interest species, Atlantic salmon, otter and white-clawed crayfish, however the local populations of these three species are not QI populations of SACs as the Proposed Development site is not hydrologically connected to European sites designated for the species (*i.e.* the Griffeen River is not located within the same river catchment that supports any SAC population of Atlantic salmon, otter and/or white-clawed crayfish).

6.44 The subject lands may be potentially used by SCIs as the Proposed Development is within the normal foraging range of some SCI species of North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA, as well as due to the mobile nature of SCI species. The SCI species lapwing *Vanellus vanellus* was recorded foraging within the Proposed Development, however, the habitat that the species was using in 2018 (tilled land, BC3) is now changed within the site to unmanaged dry meadows and grassy verges (GS2) and recolonising bare ground (ED3) habitat. Furthermore there is a considerable distance (c.43.9km northwards) to the nearest European site designated for lapwing, Boyne Estuary SPA, and therefore the local populations are not connected with any SPA populations as the Proposed Development is too distant from European sites designated for them.

6.45 With regard to SCI species of the North Bull Island SPA and the South Dublin Bay and River Tolka Estuary SPA, none were recorded using the Proposed Development site for foraging and/or roosting. Indeed, the nearest recorded inland feeding site for light-bellied brent geese *Branta bernicla hrota* is at Le Fanu Park, c.6.3km east of the Proposed Development, so the lands are significantly further inland than the farthest known inland feeding site for this species (Enviroguide Consulting, 2019). Furthermore, the habitats within the Proposed Development are deemed not suitable as an inland feeding habitat for light-bellied brent goose, which utilise open grassland pitches and fields with a short sward height as foraging and/or roosting habitat.

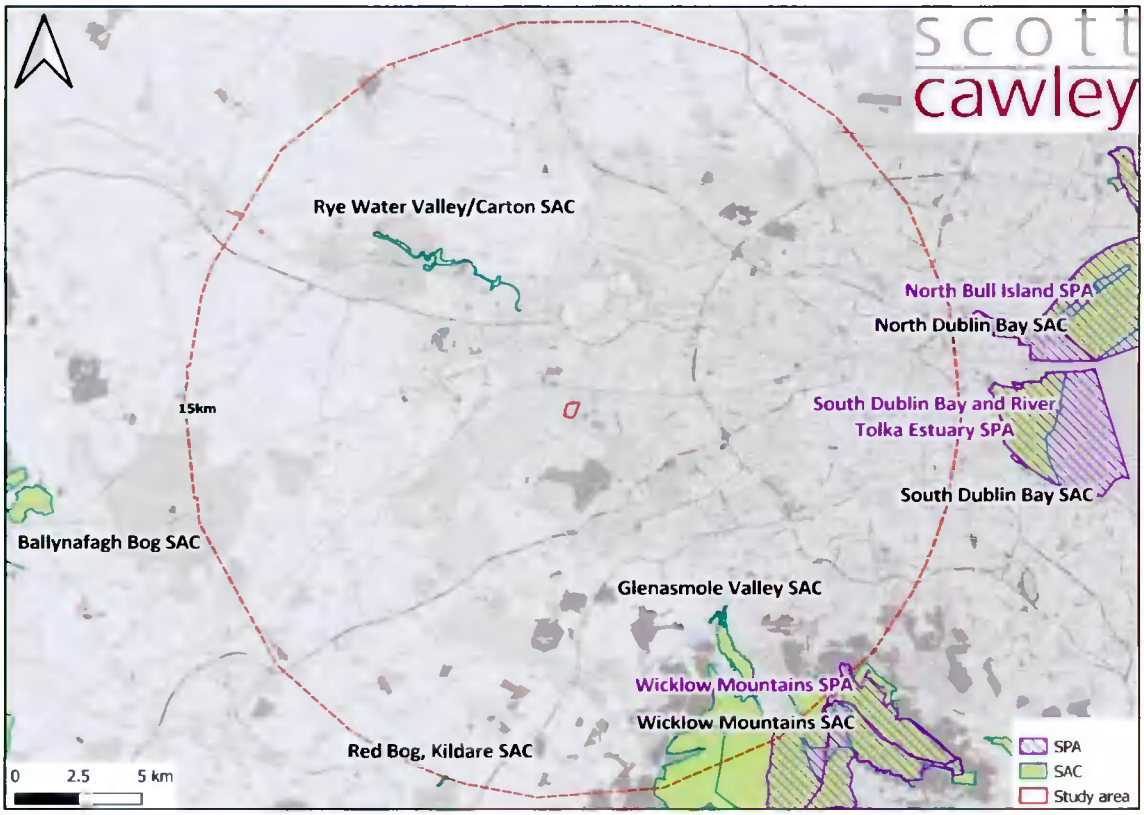

Figure 6.8 European sites in the vicinity of the Proposed Development site.

Nationally Designated Sites

6.46 Natural Heritage Areas (NHAs) are designations under the Wildlife Acts in order to protect habitats, species or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with European sites. Although many NHA designations are not yet fully in force under this legislation (referred to as '*proposed NHAs*' or pNHAs), they are offered protection in the meantime under planning legislation which requires that planning authorities give recognition to their ecological value[14]. Proposed NHAs are offered protection under county development plans, as is the case for the *South Dublin County Development Plan 2016-2022* through Policy 13 on Natural Heritage Areas, which requires that planning authorities give due regard to their protection in planning policies and decisions (South Dublin County Council, 2016).

[14] NPWS (2021). Natural Heritage Areas Webpage. Available online at www.npws.ie/protected-sites/nha. Accessed 27th January 2021.

6.47 There are 13 national sites located within c.15km of the Proposed Development, of which all are pNHAs (see Figure 6.9). The Proposed Development site does not overlap with any NHA or pNHA, with the exception of the Grand Canal pNHA. The Grand Canal pNHA flows directly north of the boundary of the Proposed Development site and overlaps with the Proposed Development over an area of c. 565sqm (see Figure 6.5). The Proposed Development drains into the Griffeen River, which is not hydrologically connected to the Grand Canal. The Griffeen River runs culverted beneath the Grand Canal and flows northwards.

6.48 There are pNHAs hydrologically connected via surface water network to the Proposed Development which are located downstream in Dublin Bay, and are designated for similar reasons as their overlapping European sites. The pNHAs within the vicinity of the Proposed Development are as follows:

- Grand Canal pNHA, located within a small section of the north-western corner of the Proposed Development boundary. The site has been designated for its habitats and biodiversity.
- Liffey Valley pNHA, located c.2.8km north of the Proposed Development site. The site is designated for its diversity of habitat and for rare flora.
- Rye Water Valley/Carton pNHA, located c.4.2km north-west of the Proposed Development site. There is no published information available for this designated site from the NPWS. It overlaps with the Rye Water Valley/Carton SAC and is likely to be designated for the same reasons, i.e. the priority Annex I habitat petrifying springs with tufa formation (Cratoneurion), and populations of the Annex II narrow-mouthed whorl snail and Desmoulin's whorl snail.
- Royal Canal pNHA, located c.4.5km north of the Proposed Development site. The site is designated for its habitats and biodiversity.
- Lugmore Glen pNHA, located c.7km south of the Proposed Development site. The site is designated for its wooded glen and woodland flora.
- Dodder Valley pNHA, located c.8.8km south-east of the Proposed Development site. The site is designated for its riparian vegetation.
- Slade of Saggart and Crooksling Glen pNHA, located c.6.7km south of the Proposed Development site. The site is designated for its wooded river valley and wetland system.
- Glenasmole Valley pNHA, located c.9.5km south-east of the Proposed Development. There is no published information available for this designated site from the NPWS. It overlaps with the Glenasmole Valley SAC and is likely to be designated for the same reasons, e.g. grassland habitats and petrifying springs.
- Kilteel Wood pNHA, located c.10.8km south-west of the Proposed Development site. The site is designated for its deciduous woodland.
- Red Bog, Kildare pNHA, located c.15km south of the Proposed Development site There is no published information available for this designated site from the NPWS. It overlaps with the Red Bog, Kildare SAC and is likely to be designated for the same reasons, e.g. transition mire and quaking bog habitat.
- North Dublin Bay pNHA, located c.15km east of the Proposed Development site. There is no published information available for this designated site from the NPWS. It overlaps with the North Dublin Bay SAC and North Bull Island SPA and is likely to be designated for the same reasons, e.g. dune and tidal habitats and wintering bird populations.
- South Dublin Bay pNHA, located c.16km east of the Proposed Development site. There is no published information available for this designated site from the NPWS. It overlaps with the South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA and is likely to be designated for the same reasons, e.g. dune and tidal habitats and wintering bird populations.
- Booterstown Marsh pNHA, located c.17.1km east of the Proposed Development site, which is designated for its tidal habitats, rare flora and wintering bird populations.
- Dolphins, Dublin Docks pNHA, located c.17.2km east of the Proposed Development site. There is no published information available for this designated site from the NPWS. It overlaps with the South Dublin Bay and River Tolka Estuary SPA and is likely to be designated for the same reasons, i.e. primarily the Arctic and common tern populations it supports.

6.49 More detailed descriptions of the qualifying interests of the pNHA sites in the vicinity of the Proposed Development are presented in Appendix 6.1.

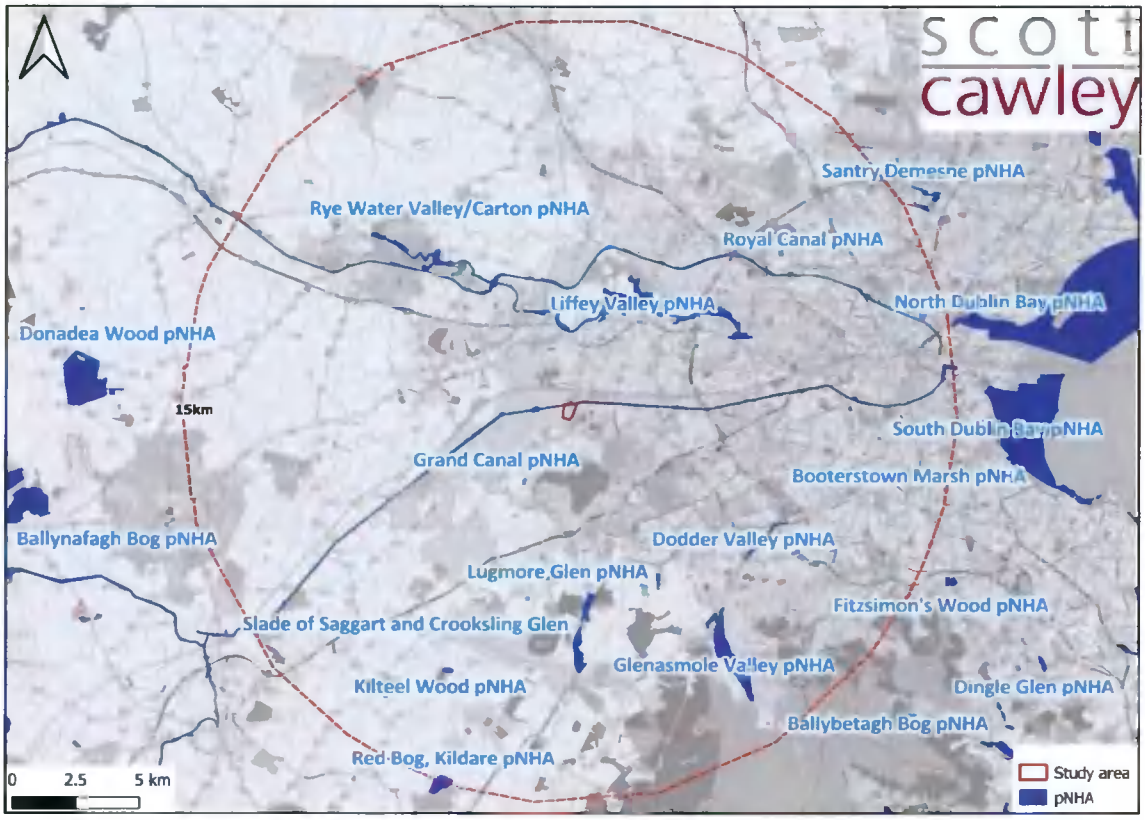

Figure 6.9: Natural Heritage Areas and proposed Natural Heritage Areas within the vicinity of the Proposed Development site.

Figure 6.10: Location of the Proposed Development site in relation to the Grand Canal pNHA.

Habitats and Flora

Rare and Protected Flora

6.50 A search of the National Biodiversity Data Centre (NBDC) database for records of rare and/or protected species within c.2km of the Proposed Development site returned no records of Red-listed species or Flora Protection Order vascular plant/bryophyte species. However, the NPWS database holds records for the Flora (Protection) Order, 2015, species *Hordeum secalinum, Clinopodium acinos, Betonica officinalis, Hypericum hirsutum, Groenlandia densa, Scrophularia umbrosa, Viola hirta* and *Galeopsis angustifolia* within the same hectad grid square in which the Proposed Development is located (*i.e.* O03). No protected and/or rare flora were recorded within the Proposed Development site during the surveys.

Non-native Invasive Flora

6.51 With regards to records for non-native invasive species within c.2km of the Proposed Development, the NBDC database search returned records for the following non-native invasive flora: *Elodea nuttallii* and *Ribes nigrum*, the former being listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations*, 2011 as amended. *Elodea nuttallii* was recorded within the Grand Canal c. 1km west of the Proposed Development in 2020.

6.52 One stand of *Reynoutria japonica* was also recorded along Kishoge Road in Clonburris, c.1.4km north-east of the Proposed Development (Scott Cawley, 2020). *Reynoutria Japonica* is listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations,* 2011 as amended.

6.53 A second invasive non-native species *Buddleja davidii* was recorded in two locations in recolonising bare ground and hedgerow habitats within the Proposed Development site. The invasive non-native species *Prunus laurocerasus, Mercurialis annua* and *Conyza floribunda* were identified just west of the derelict property in the north of the Proposed Development site. None of the aforementioned species are currently listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations*, 2011 as amended.

Habitats

6.54 The lands contain a range of habitats which are typical of the agricultural landscape found more broadly to the west of the Proposed Development site (see Figure 6.5). A full list of species recorded within each habitat is included in Appendix 6.4.

Dry meadows and grassy verges (GS2) (total area c.11.2ha)

6.55 Dry meadow and grassy verges (GS2) habitat type is the most common habitat within the Proposed Development site (see Figure 6.7 Dry meadow (GS2) grassland within the Proposed Development site.). The composition and dominance of the sward differed somewhat across the extent of the site, due to the fact that some of the grassland has developed on land that was in 2018 classified as arable fields (BC3) (Scott Cawley, 2019), but farming has since been abandoned and the fields have been recolonised by unmanaged grassland. Typical grass species in this habitat within the site include abundant *Arrhenatherum elatius* and *Dactylis glomerata*, along with *Agrostis stolonifera* and the broadleaved species *Ranunculus repens. Arctium minus* is frequent, particularly in the more disturbed areas that were formerly arable fields, along *Cirsium arvense* and *Rumex obtusifolius. Rubus fruticosus* agg. can be found encroaching in some places. Other areas of this habitat have developed on former areas of actively grazed, improved agricultural grassland (GA1), which have since become under-grazed/abandoned and have reverted to unmanaged GS2 grassland.

6.56 This habitat is considered to be of local importance (higher value) due to its relatively high species diversity deriving from its varied origins.

Figure 6.6 Habitats recorded within the Proposed Development site boundary.

Figure 6.7 Dry meadow (GS2) grassland within the Proposed Development site.

Improved agricultural grassland (GA1) (total area c.7.8ha)

6.57 Agricultural fields in the northern section of the Proposed Development site have been classified as improved agricultural grassland (see Figure 6.7). These fields are currently grazed by a few horses, but with limited grazing, these fields are slowly reverting to dry meadows and grassy verges (GS2) habitat (see above). The majority of these fields are bordered by hedgerows, with some adjacent

drainage ditches. Species typical of this habitat type and recorded on site include *Poa trivialis*, *Holcus lanatus*, *Dactylis glomerata*, *Ranunculus repens*, *Rumex obtusifolius* and *Trifolium repens*. Boundary hedgerow species encroaching into this habitat type included *Rubus fruticosus* agg. and *Potentilla reptans*. Some areas of the fields also contained the weedy species *Senecio jacobaea*, *Urtica dioica* and *Cirsium arvense*. This habitat is considered to be of local importance (lower value) due to its low species diversity.

Figure 6.8 Improved agricultural grassland (GA1) within the Proposed Development site.

Hedgerows (WL1) (total length c.1.39km)

6.58 Hedgerows (WL1) comprise many of the field boundaries within or on the boundary the Proposed Development site. Hedgerow height ranges from c. 2.5m to 5m in height and c. 2m to 4m in width. The composition of hedgerow vegetation is largely similar across the site. Many of the hedgerows have wet drainage ditches (FW4) at their base (see Figure 6.8). Common hedgerow species recorded were *Acer pseudoplatanus, Rubus fruticosus* agg., *Sambucus nigra*, *Crataegus monogyna*, *Hedera helix* and *Prunus spinosa*, with *Rosa canina* agg. and *Ilex aquifolium* occurring occasionally. The understory was typical of hedgerow habitat and included *Vicia sepium, Dactylis glomerata, Sonchus arvensis, Galium aparine* and *Brachypodium sylvaticum* (see Plate 6.3). One bush of the non-native invasive species *Buddleia davidii* was recorded in hedgerow habitat in the north-western corner of the site. This habitat is considered to be of local importance (higher value) due to that fact that it forms part of the wider linear network through the local landscape.

Figure 6.9 One of the many hedgerows (WL1) found on site.

Treelines (WL2) (total length c.688m)

6.59 Treelines (WL2) within the site are comprised of *Acer pseudoplatanus*, *Sambucus nigra* and *Rubus fruticosus* agg., and a *Salix* species occurs in the treeline near the Grand Canal (see Figure 6.9). The ground layer of the treelines include species like *Anthriscus sylvestris* and *Hedera helix*. Some of the species are similar to those in the adjacent hedgerow habitat. The treelines form part of the wider linear network through the local landscape and is therefore considered to be of local importance (higher value).

Figure 6.10 Mature treeline (WL2) at the northern edge of the Proposed Development site.

Drainage ditches (FW4) (total length c.993m)

6.60 Drainage ditches (FW4) occur adjacent to many of the hedgerows on site and are actively draining the surrounding agricultural grassland fields. These are largely overgrown by mainly *Rubus fruticosus* agg. Further new drainage ditches have been constructed in the south-west of the site adjacent to soil heaps removed where the proposed data centre is to be situated. In these ditches, *Agrostis stolonifera* and *Ranunculus repens* are abundant. This habitat is considered to be of local importance (lower value) due to its very low species diversity.

Recolonising bare ground (ED3) (total area c.2.6ha)

6.61 Areas of recolonising bare ground (ED3) occupy parts of both the north and south of the Proposed Development site. Many of these areas were formerly tilled and used to grow arable crops but have since become abandoned following archaeological investigations on the site in 2019. Furthermore, these archaeological investigations in the south of the site have created a fresh area of recolonising bare ground that was not present in the 2018 surveys (Scott Cawley, 2018). This habitat type includes species that typically occur in disturbed open ground with species including *Didymodon* species, *Trifolium dubium, Senecio vulgaris, Rumex obtusifolius* and *Bryum capillare*. Wetter ground is indicated by the presence in the southern ED3 area of *Ranunculus repens* and some *Agrostis stolonifera* (see Figure 6.10). This habitat is considered to be of local importance (lower value) due to its relatively low species diversity and mostly recent origins due to site clearance.

Figure 6.11 Recolonising bare ground (ED3) in cleared area at the southern end of the Proposed Development site.

Buildings and artificial surfaces (BL3) (total area c.0.63ha)

6.62 Buildings and artificial surfaces (BL3) are located in the north of the Proposed Development site and relate to farm sheds and outbuildings, farmyard hardstanding, access lanes and one derelict residential property. A number of corrugated tin and block farm sheds are no longer standing and have been previously demolished and remain as on site as rubble. Buildings that remain intact with a roof in place include one farm shed, the derelict residential property (see Figure 6.11) and the adjacent outbuildings, however these buildings are all in a state of disrepair and some appear to have been burnt out. A currently occupied house also occurs at the north-eastern corner of the site. This habitat is considered to be of negligible importance due to its very low species diversity and habitat potential.

Figure 6.12 Collapsed farm shed in north of the Proposed Development site.

Fauna

Badger

6.63 Badger *Meles meles*, and their breeding and resting places, are protected under the Wildlife Acts. The NBDC data search returned one record for badger within c.2km of the site, a hectad record in the adjacent grid square O02 which occurs c.1.6km to the south, and the NPWS returned six records for badger within the same grid square in which the Proposed Development site is located (*i.e.* O03). The most recent and closest high resolution record (dated 1992) is located c.2.5km south-west of the Proposed Development site at Peamount, Newcastle. A disused badger sett was also identified north-east of the Proposed Development, in the south-western end of Kischoge Road near the Clonburris Strategic Development Zone (Scott Cawley, 2020). This subsidiary or outlying sett of three holes had no recent signs of use, *e.g.* spoil heaps outside entrances, snuffle holes mammal tracks or latrines nearby.

6.64 No signs of badger activity were noted within the Proposed Development site. The habitats found within the Proposed Development site provide suitable foraging and commuting habitat for badgers. Badgers, and their breeding and resting places, are protected under the Wildlife Acts. Due to their stable Irish populations, they are considered to be of "Least concern" in terms of conservation (Nelson *et al.*, 2019). The subject lands are considered to be of local importance (higher value) for badgers, as there is suitable habitat within the Proposed Development site and its vicinity which is likely to support local badger populations. However, the absence of recent signs of badger may indicate that the surroundings are unlikely to support significant badger populations.

Otter

6.65 Otter *Lutra lutra*, and their breeding and resting places, are protected under the Wildlife Acts. Otter are also listed on Annex II and Annex IV of the EU Habitats Directive and are afforded strict protection under the Habitats Directive and the *European Communities (Birds and Natural Habitats) Regulations, 2011*. The NBDC data search returned three records for otter within c.2km of the Proposed Development, and the NPWS, five records within the grid square O03. The most recent and closest record for otter (dated 1982) is from c. 30m north-east of the Proposed Development site, by the Grand Canal.

6.66 There were no signs of otter present within the site or along the stretch of the Grand Canal directly north of the site and the banks here are largely flat, open and sparsely vegetated and are thus low suitability for otter holts, although the canal is very likely used by commuting and foraging otters. The Griffeen River, into which the site drains, is potentially used by commuting and foraging otters. The riverbanks north-east of the site are inaccessible, steep and heavily vegetated (Scott Cawley, 2020) and may have some potential for otter holts, however, none were identified in the accessible sections. The most recent observation of otter by Scott Cawley ecologists along the Grand Canal and near the Proposed Development is from the 1st February 2021. They have also previously observed otter in the Baldonnell stream that lies upstream of the Griffeen, and are aware that artificial otter holts were installed along the Griffeen River when it was realigned as part of the Grangecastle area development (L. Higgins, pers. comm. 1st February 2021). Otters are also known to use the River Liffey and the Camac River (Macklin *et al.*, 2019) and have been recorded on the Grand Canal. Therefore, the usage of the site by otter cannot be ruled out.

6.67 The Grand Canal and the Griffeen River, as well as the Camac River, are located in a separate sub-catchment to any European site designated for otter, and therefore local otter populations do not form part of any SAC populations. Due to the aforementioned facts and the presence of suitable habitat directly adjacent to the Proposed Development site, the otter populations upstream and downstream and along the canal are considered to be of county importance.

Small Mammals

6.68 Small mammals, hedgehog *Erinaceus europaeus*, Irish hare *Lepus timidus hibernicus*, Irish stoat *Mustela erminea hibernica*, pine marten *Martes martes*, pygmy shrew *Sorex minutus* and red squirrel *Sciurus vulgaris* are protected under the Wildlife Acts. The NBDC database search identified the following records within c.2km of the Proposed Development site: two records each of Irish hare and hedgehog and one each of Irish stoat and pygmy shrew.

6.69 No signs of protected mammal fauna were noted within the lands. The grasslands and hedgerows within the Proposed Development site offer suitable foraging and breeding habitat for hedgehogs, Irish hare, Irish stoat and pygmy shrews. A series of small mammal holes, at least 20 in number (some were obscured by the dense hedgerow vegetation in places), were identified in a soil bank underneath the hedgerow which runs along the western edge of the site (see Figure 6.12). These holes were considered to be far too small for badgers (or indeed foxes) and so were very likely excavated by European rabbits *Oryctolagus cuniculus*. Neither European rabbits nor foxes are protected under any Irish or EU legislation.

6.70 All small mammal species returned in the NBDC search are of "Least" conservation concern (Nelson *et al.*, 2019). They are widely distributed throughout Ireland. Although the habitats on-site do not present optimal breeding habitat for all small mammal species, they may be potentially used for commuting and foraging by all. The local small mammal populations are considered to be of local importance (higher value).

Figure 6.13 Location of mammals holes observed within the study area that includes the canal tow area outside the Proposed Development site

Non-native Invasive Mammals

6.71 With regards to records for invasive, non-native, mammal species within c.2km of the Proposed Development, the NBDC database search returned three records for Eastern grey squirrel *Sciurus carolinensis*, which is listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations, 2011*. This record from 2015 is located at Finnstown Castle Hotel c.1.1km north of the site. No eastern grey squirrels were recorded within the site during the surveys.

Birds

6.72 All wild birds, and their nests and eggs, are protected under the Wildlife Acts. Some bird species are also listed on Annex I of the EU Birds Directive. The NBDC database holds records for 46 bird species which are known to occur within c.2km of the Proposed Development site. Species listed under the Birds Directive or in the *Bird of Conservation Concern of Ireland 2014-2019*[15] are presented in a table in Appendix 6.2.

[15] Colhoun, K. & Cummins, S. (2013) *Birds of Conservation Concern in Ireland 2014-2019*. Irish Birds 9:523-544.

Breeding birds

6.73 A range of common bird species were noted using the site for foraging purposes during the multidisciplinary surveys undertaken in November 2018 and January 2021. These include blackbird *Turdus merula*, blue tit *Cyanistes caeruleus*, bullfinch *Pyrrhula pyrrhula*, buzzard *Buteo buteo*, chaffinch *Fringilla coelebs*, dunnock *Prunella modularis*, goldfinch *Carduelis carduelis*, hooded crow *Corvus cornix*, magpie *Pica pica*, meadow pipit *Anthus pratensis*, robin *Erithacus rubecula*, wren *Troglodytes troglodytes*, skylark *Alauda arvensis*, snipe *Gallinago gallinago*, linnet *Carduelis cannabina*, tree sparrow *Passer montanus*, house sparrow *Passer domesticus*, lapwing *Vanellus vanellus*, redwing *Turdus iliacus*, pied wagtail *Motacilla alba* and woodpigeon *Columba palumbus*.

6.74 Of these species, five (*i.e.* skylark, linnet, snipe, robin and tree sparrow) are Amber-listed and are therefore considered to be of Moderate Conservation Concern by Colhoun & Cummins (2013). Two of these species (lapwing and meadow pipit) are Red-listed and are considered to be of High Conservation Concern by Colhoun & Cummins (2013). The records for these were from within the Proposed Development site itself. Individual meadow pipits, as well as small flocks of up to 4 birds, were observed in arable fields, also in November 2018. Both skylark and meadow pipit nest in unmanaged grassland habitat, such as the GS2 grassland which occurs on site.

6.75 Breeding birds use various habitats, including trees, structures, grasslands and scrub, for nesting. The presence of several bird species with territories and with young within the Proposed Development site indicate that it is likely to be used for breeding by various species. At least three old bird nests were observed during the surveys in crevices in the walls and eaves of an old abandoned house and farm buildings in the north of the site. However, more nests may occur on the site but were camouflaged and therefore well hidden.

6.76 Barn swallows *Hirundo rustica*, house martins *Delichon urbicum* and swifts *Apus apus* frequently use eaves and crevices on buildings as nesting places. There was no evidence of these particular species nesting within the buildings onsite, nor were they present at the time of the surveys, however, as nests were observed on site, the possibility of these species nesting in these buildings during the breedind period cannot be conclusively ruled out.

6.77 Due to the aforementioned facts and the presence of suitable habitat within and directly adjacent to the Proposed Development site, the local breeding bird populations are considered to be of local importance (higher value).

Raptors

6.78 One raptor species was recorded within the Proposed Development site during the surveys, namely, buzzard *Buteo buteo*. This species is Green-listed (a species of Low Conservation Concern) by Colhoun & Cummins (2013). Given the presence of this species and the suitable habitat within and directly adjacent to the Proposed Development site, the local raptor populations are considered to be of local importance (higher value).

Wintering birds

6.79 The desk study records from the NBDC include 12 wintering waterfowl, gull and wader species within c.2km of the Proposed Development site. These records are present in Appendix 6.2. Of these, lapwing *Vanellus vanellus* and snipe *Gallinago gallinago* were recorded within or adjacent to the Proposed Development during the field visit in November 2018. A flock of *c.* 300 lapwing were recorded in the most southerly arable/stubble field (BC1) within the site in November 2018. The flock of lapwing flushed and settled in neighboring agricultural land to the west of the proposed site. This arable field habitat no longer occurs within the Proposed Development site as all arable farming has been abandoned here. Three individual snipe were flushed from arable fields (which no longer occur on site) during the field visit in November 2018. Other wintering bird species recorded included the passerine species redwing *Turdus iliacus*. This species is Green-listed (a species of Low Conservation Concern) by Colhoun & Cummins (2013).

6.80 Of the wintering bird species recorded, only lapwing is an SCI species of any European site. The nearest European site for lapwing is the Boyne Estuary SPA, located c.43.9km north of the Proposed Development.

6.81 The Proposed Development is within the normal foraging range of SCI species of North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA, however, it comprises of limited areas of suitable foraging habitat due to grasslands being largely unmanaged or grazed and enclosed by hedgerows and/or treelines. No other SCI species of any European sites was recorded in the vicinity of the Proposed Development site during field surveys.

6.82 Although lapwing was recorded during the surveys, the arable field habitat which they were recorded as using no longer exists on site and has been entirely replaced by unmanaged grassland and recolonising bare ground since they were seen in 2018. Furthermore, the habitats within and adjacent to the Proposed Development site are generally considered sub-optimal habitat, *i.e.* habitats were not open amenity grassland or wetlands, for wintering SCI waterfowl and waders. Lapwing generally prefer open pastureland and arable fields (i.e. tillage) which are largely now absent in the Proposed Development site, therefore making it sub-optimal for the species. Considering that the nearest designated site for lapwing is c.39km north of the Proposed Development site, the local populations do not form part of SPA populations.

6.83 The habitats offer suitable foraging habitat and shelter for smaller overwintering species such as the passerine species redwing, which was recorded during the field visit to the site in November 2018. Considering the above, the local populations of wintering birds, are considered to be of local importance (higher value).

Bats

6.84 Bats, and their breeding and resting places, are protected under the Wildlife Acts. All bat species are also listed on Annex IV of the EU Habitats Directive (with the lesser horseshoe bat also listed on Annex II) and are afforded strict protection under the Habitats Directive and the *European Communities (Birds and Natural Habitats) Regulations, 2011*. The NBDC and the NPWS hold records for the following five bat species in the vicinity of the Proposed Development site:

- Brown long-eared *Plecotus auritus*, six records, with the most recent record located c. 150m east of the Proposed Development site from 2008;
- Common pipistrelle *Pipistrellus pipistrellus*, 11 records, with the most recent record located c. 150m east of the Proposed Development site from 2008;
- Daubenton's bat *Myotis daubentonii*, 31 records, with the most recent record located along the Grand Canal at the northeastern corner of the Proposed Development site from 2012;
- Leisler's bat *Nyctalus leisleri*, 11 records, with the most recent record located c. 150m east of the Proposed Development site from 2008; and
- Soprano pipistrelle *P. pygmaeus*, 12 records, with the most recent record located c. 150m east of the Proposed Development site from 2008.

6.85 External and internal inspections of all standing, unoccupied buildings (all located in the northern portion of the site) were carried out on 26th January 2021, where it was safe to do so. A derelict residential property was surveyed, along with a standing farm shed west of the property and old farm buildings just north of the property which were mostly roofless. No signs of bats were recorded in any of the buildings.

6.86 The farm shed was considered to have low suitability for roosting bats, showing few potential roost features with the exception of gaps between trusses and the corrugated roof sheets, with very exposed conditions, possibly utilised for feeding by bats. The derelict property is a very exposed and open building, with limited bat roosting potential (see Figure 6.13).

6.87 The attic space could not be fully assessed due to safety concerns, however it was checked using a ladder and high-powered torch from a safe position through gaps into the attic. Light could be seen coming through the roof in areas, very open space with limited potential for summer roosting bats, possibly suitable for hibernation but unlikely due to how exposed and dilapidated the building is.

6.88 The crevices in the building included a 20x20cm hole going up into the soffit board, probably leading into the attic space, with further smaller holes/gaps into the soffit board present throughout the building, some with nesting bird material present, gaps of varying sizes present along where the roof joins the

facia board, underneath slates across the whole building, and gaps on both gable ends where concrete has come away from the edge of the slate, leaving crevices under roof slates.

Figure 6.14 External view of derelict property in the northern side of the Proposed Development site.

6.89 Overall the building was considered low suitability for bats. The old farm buildings just to the north of this derelict property were roofless and therefore very exposed, however, they had thick stone walls with potentially suitable cracks and crevices, including above entrance doorways. which are potentially suitable for summer roosting of small numbers of bats, and *Hedera helix* (Ivy) was extensive on both end gables of one building (see Figure). The largest of these aforementioned crevices was checked using an endoscope, and no signs of bat presence were observed. One small building had a corrugated iron roof. All of these buildings were considered to be of low suitability for bats.

Figure 6.15 View of end gable of derelict farm building, with extensive Hedera helix (Ivy), in the northern side of the Proposed Development site.

6.90 The habitat within the lands provides good commuting and foraging routes for bats using the wider environs, particularly near and along the Grand Canal, and its level of suitability is valued high as per the Bat Conservation Trust (BCT) guidelines (Collins ed., 2016). The treelines and hedgerows located along field boundaries and the boundary of the Proposed Development site create linear corridors together with the Grand Canal, which connects the site to the surrounding area. The lands within the

Proposed Development are largely unlit with the exception of light spill originating from the adjacent main roads, and therefore are highly suitable for commuting and/or foraging bats.

6.91 In total, six trees within the northern part of the Proposed Development site were identified with potential bat roost features during the ground-level assessment on 26th January 2021 (see Figure 6.15). All of the trees were categorized to have 'moderate' potential. The species included *Acer pseudoplatanus* and *Fraxinus excelsior*.

Figure 6.16 Trees with suitability for roosting bats within the study area of the Proposed Development site and canal environs

6.92 During the bat activity surveys three bat species were recorded foraging and commuting within the subject lands, *i.e.* common pipistrelle, Leisler's bat and soprano pipistrelle. The activity was mainly focused on woodland edge and hedgerow habitats in the unlit northern sections of the site (see Figure 6.1).

6.93 Furthermore, four static bat detectors (SM2) were deployed on site from 22nd November to 12th December 2018 to record bat activity for a total of 20 nights. Static detectors were placed along four different hedgerows throughout the Proposed Development site at the following Irish National Grid reference locations: O 02789 31802; O 02636 31861; O 02563 31632; and, O 02680 32110. No bat activity was recorded on three static detectors (one of the four did not record any data) deployed on hedgerows within the Proposed Development. This is not surprising given that data was recorded outside of the bat activity season, however temperatures were generally mild and weather conditions were generally calm during the recording period. One common pipistrelle was recorded at static location O 02636 31861 near the centre of the site. No other bats were recorded. Considering this survey was carried out outside the active season, it was assumed that bats would use hedgerows within the proposed site to forage and commute along.

6.94 The bat species recorded during the surveys and returned in the NBDC data search are all common species and of "Least concern" (Nelson *et al.*, 2019). The local bat populations using the Proposed Development site and the surroundings as foraging and commuting habitat are valued as being of local importance (higher value).

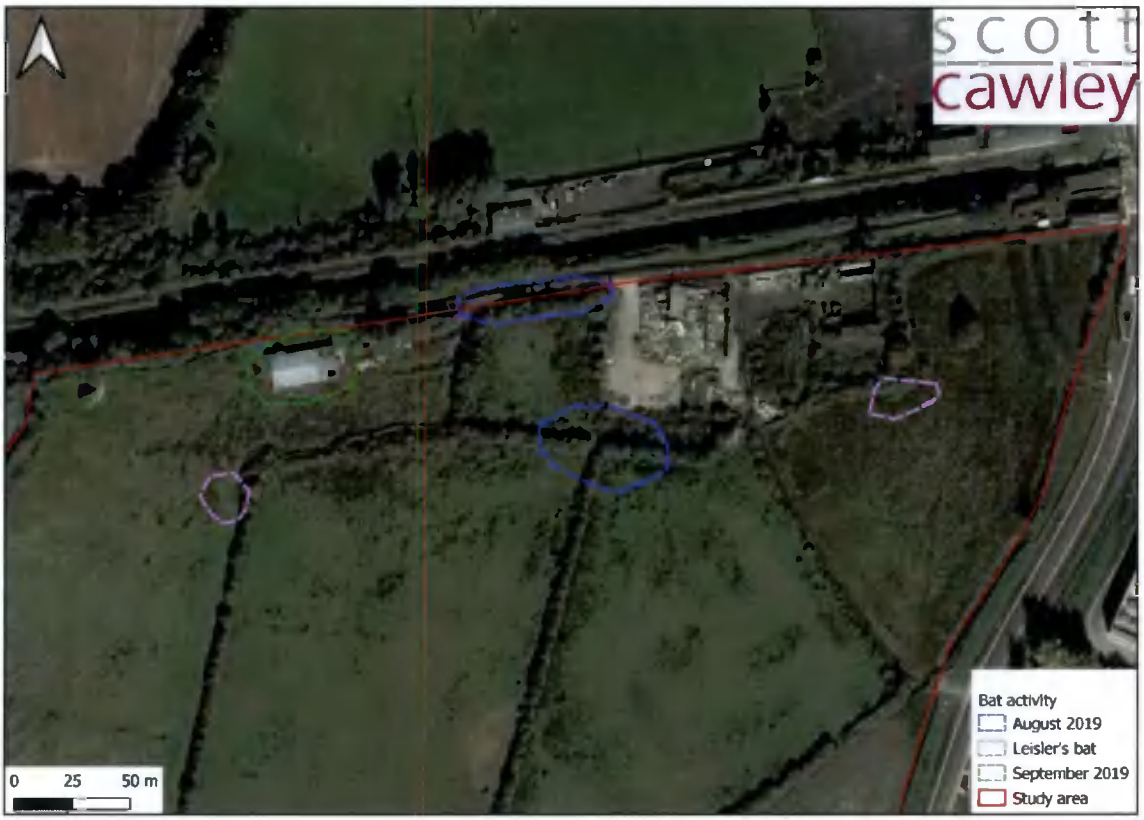

Figure 6.17 Areas of high bat activity

Amphibians and Reptiles

6.95 The Wildlife Acts provide protection to Ireland's only reptile species, common lizard, *Zootoca vivipara* and two amphibian species, common frog *Rana temporaria* and smooth newt *Lissotriton vulgaris*.

Common frog

6.96 The NBDC and the NPWS databases hold 1 and 54 records respectively, for common frog within c.2km of the subject lands and the same grid square in which the Proposed Development site is located (*i.e.* O03). The species is widely distributed throughout the country and is associated with standing water.

6.97 Multiple areas of standing water suitable for common frog were identified within the Proposed Development site. Most of these were likely to be present due to heavy rain and are ephemeral in nature, depending on periods of precipitation. The drainage ditches on site were overgrown by the adjacent scrub, and therefore the shading of the vegetation has made them unsuitable for breeding common frog (Baker *et al.*, 2011). Newly built drainage ditches adjacent to soil heaps from clearing of ground for development works in the south end of the site are probably also ephemerally wet, depending on sustained periods of precipitation. Although no individuals were observed during the surveys, their presence on site cannot be ruled out based on availability of suitable habitat within the subject lands and their wide distribution across the country.

6.98 There is suitable habitat for common frog in the Proposed Development site and its immediate vicinity and there are records of common frog in the area, therefore local common frog populations are valued to be of local importance (higher value).

Smooth newt

6.99 The NBDC database search returned three records and the NPWS database five records for smooth newt from within the same grid square in which the Proposed Development site is located (i.e. O03). The most recent record is from 2018.

6.100 No individuals were observed at the time of the survey, and it is considered unlikely that smooth newts are present within the Proposed Development site due to lack of suitable habitat. Smooth newts are

typically associated with waterbodies of standing water such as permanent ponds which are absent from the site. Local smooth newt populations are of local importance (higher value), however, they are not considered to be a key ecological receptor due to lack of suitable habitat, provided that there will be no indirect off-site effects.

Common lizard

6.101 There are no records of common lizard located within c.2km of the Proposed Development site in the NBDC database, however, the NPWS holds one record for the species within the same grid square in which the Proposed Development site is located (i.e. O03), from 1970. The nearest record for common lizard on the NBDC database is located c.10.9km east of the Proposed Development site in Terenure, Dublin 6, from 2020.

6.102 This species is widely distributed in Ireland and is found in a variety of habitats[16], including grassland, scrub and hedgerows, of which grassland and hedgerow habitats occur on site. Suitable habitat also occur within the surrounding environment. Therefore the local common lizard populations are considered to be of local importance (higher value).

Fish

6.103 There are no records of fish species within c.2km of the Proposed Development site on the NBDC database, however, the *Water Framework Directive Fish Stock Survey of Rivers in the Eastern River Basin District* (Kelly *et al.*, 2012) contains records of four species (brown trout *Salmo trutta*, European eel *Anquilla anquilla*, roach *Rutilus rutilus* and three-spined stickleback *Gasterosteus aculeatus*) in the Griffeen River. According to Inland Fisheries Ireland (Scott Cawley, 2020), the Griffeen River also holds populations of Atlantic salmon *Salmo salar* and sea trout *Salmo trutta trutta.*

6.104 Of the above species, only two are of conservation concern: Atlantic salmon and European eel. These two species are listed as "Vulnerable" and "Critically Endangered", respectively (Nelson et al., 2019). In addition, Atlantic salmon is listed in Annex II and Annex V of the EU Habitats Directives.

6.105 Fish are present in a wide range of waterbodies with varying water quality throughout Ireland. Considering that the waterbodies hydrologically connected to the Proposed Development site contain protected and/or rare fish species (*i.e.* Atlantic salmon and European eel) these fish populations are considered to be of county importance, whereas fish populations of species of no conservation concern (*e.g.* stickleback and roach) are valued as local importance (lower value).

Freshwater white-clawed crayfish

6.106 Freshwater white-clawed crayfish *Austropotamobius pallipes* is protected under the Wildlife Acts. The species is also listed on Annex II and Annex V of the EU Habitats Directive and are afforded strict protection under the Habitats Directive and the *European Communities (Birds and Natural Habitats) Regulations, 2011*. There are no records for freshwater white-clawed crayfish c.2km of the Proposed Development site in the NBDC database. The nearest record is from the Camac River, c.3,5km south-east. The most recent record is from 2013.

6.107 South Dublin County Council carried out a white-clawed crayfish survey in the Camac River in 2018 and found that the river holds good populations of the species (Scott Cawley, 2020). As the Camac River is connected to the Griffeen River via the River Liffey and holds good populations of white-clawed crayfish, Inland Fisheries Ireland have recommended to assume that the species is present within the Griffeen River as well (Scott Cawley, 2020).

6.108 The surveys carried out by Forest, Environmental Research and Services (FERS) Ltd. in 2018, did not record any white-clawed crayfish in the Griffeen River or the Grand Canal, although the species has been recorded in the latter in the past. However, the surveys did record three individual white-clawed crayfish in the Cappagh feeder stream, which is located to the east of the Proposed Development site (Scott Cawley, 2020).

[16] The Herpetological Society of Ireland (2020). Common Lizard. Available online at www.thehsi.org Accessed 14th July 2020.

6.109 There are no designated sites for freshwater white-clawed crayfish within the same river catchment as the Proposed Development. The nearest designated site for the species is the Lough Lene SAC, c.61.4km north-west of the Proposed Development site. Freshwater white-clawed crayfish populations present in the Camac River, the Griffeen River, the Cappagh feeder stream, the Grand Canal or the River Liffey downstream are not connected to, or support, any SPA populations.

6.110 Freshwater white-clawed crayfish is found in rivers, streams and lakes, and considering that the Camac River supports their populations and that there is a hydrological link between the Camac River and the Griffeen River, it is possible that the species can be found in the Griffeen River also (into which the Proposed Development site drains). Due to the presence of suitable habitat, local freshwater white-clawed crayfish populations are considered to be of county importance.

Summary of Ecological Evaluation

6.111 Table 6.3 and Table 6.4 below summarises the ecological evaluation of all receptors taking into consideration legal protection, conservation status and local abundance, and identifies the Key Ecological Receptors (KERs). Species, habitats and features not qualifying as KERs are not subjected to impact assessment in line with current best practice of assessing the impacts on what are determined to be important ecological or biodiversity features: CIEEM and TII guidelines (CIEEM, 2018 and National Roads Authority, 2009).

Table 6.3 Summary of the ecological evaluation of designated sites.

Ecological Receptor	Ecological Valuation	KER?
Designated Sites		
North Bull Island SPA	International	**Yes**
South Dublin Bay SAC	International	**Yes**
South Dublin Bay and River Tolka Estuary SPA	International	**Yes**
North Dublin Bay SAC	International	**Yes**
All other European sites	International	No
Grand Canal pNHA	National	**Yes**
Dolphins, Dublin Docks pNHA	National	**Yes**
South Dublin Bay pNHA	National	**Yes**
Booterstown Marsh pNHA	National	**Yes**
North Dublin Bay pNHA	National	**Yes**
All other nationally designated sites	National	No

Table 6.4 Summary of the ecological evaluation of habitats and fauna.

Ecological Receptor	Ecological Valuation	KER?
Habitats		
Improved agricultural grassland (GA1)	Local importance (lower value)	No
Buildings and artificial surfaces (BL3)	Local importance (lower value)	No
Drainage ditches (FW4)	Local importance (lower value)	No
Recolonising bare ground (ED3)	Local importance (lower value)	No
Dry meadows and grassy verges (GS2)	Local importance (higher value)	**Yes**
Hedgerows (WL1)	Local importance (higher value)	**Yes**
Treelines (WL2)	Local importance (higher value)	**Yes**
Fauna Species		
Badger	Local importance (higher value)	**Yes**
Otter	County importance	**Yes**
Small mammals	Local importance (higher value)	**Yes**
Breeding birds	Local importance (higher value)	**Yes**
Wintering birds	Local importance (higher value)	**Yes**
Raptors (non-Annex I)	Local importance (higher value)	**Yes**
Bats	Local importance (higher value)	**Yes**
Common frog	Local importance (higher value)	**Yes**
Smooth newt	Local importance (higher value)	No
Common lizard	Local importance (higher value)	**Yes**
Fish (species of no conservation concern)	Local importance (lower value)	No
Fish (species of conservation concern)	County importance	**Yes**
Freshwater white-clawed crayfish	County importance	**Yes**

Characteristics of the Proposed Development

6.112 The Proposed Development is to be located to the west of Grange Castle Business Park located in the townland of Ballymakaily between the N4 and N7 in west Dublin. The Grand Canal runs along the northern boundary of the site. A full detailed description of the Proposed Development is set out within Chapter 2 of the EIA Report.

6.113 The Proposed Development incorporates the construction of a pair of single storey data centre buildings (4 data halls) of *c.* 12,797sqm. The development will also include *c.* 2,404sqm of office space. It is to be located within the north-western part of the overall lands that will include 24 no. standby emergency generators with associated flues (each 25m high) to the east of the buildings. A diesel oil tank of 30m^3 will be required for each back-up generator to the data centres (i.e., 24 no. tanks of 30m^3 will be required). All tanks will be bunded.

6.114 The application will also include the construction of a gas powered generation plant in the form of 3 no. two storey buildings with a gross floor area of 9,286sqm. These building will include 2 no. diesel generators each. A diesel oil tank of 6m^3 will be required for each generator (i.e., 6 no. tanks of 6m^3 will be required. All tanks will be bunded.

6.115 The Proposed Development will result in a hardstanding area of approximately 21,799sqm, as follows:

- Access Road – Tarmac: 5,940sqm;
- Gravel Area: 5,940sqm;
- Data Hall Roof Area: 5,823sqm;
- Service Yard Slab Area – Concrete: 1,106sqm;
- Generator Yard Slab Area – Concrete: 1,020sqm; and
- Porous Asphalt (Car Park Area): 1,277sqm.

6.116 The site will be drained and surface water will be contained within the overall sites drainage network and managed in a sustainable manner, in accordance with all relevant guidelines and specifications. Stormwater will discharge through an adequately sized attenuation pond at the northern end of the site ultimately discharging to the existing storm sewer to the north east of the site. The outflow from the attenuation pond, will be restricted by way of a Hydrobrake facility, which will limit the discharge to 9.60l/s, which is the calculated QBAR greenfield run-off rate. A connection to the existing off site Irish Water foul sewer and potable water network will be established.

6.117 The Proposed Development will result in an increased demand for water of 0.086l/s (average). With regard to foul water, the Proposed Development is proposed to discharge foul water from the Proposed Development, via a 225mm Ø gravity foul sewer outfall and discharge into the existing 450mm Ø connection. It is proposed that all foul condensate effluent from the proposed new data halls, will be connected into head manholes adjacent to the data halls. The peak wastewater flow will not be in excess of c. 0.54l/s.

6.118 There will be no blasting or other works that may impact groundwater. The works will involve vegetation clearance and there will be demolitions of all buildings within the Proposed Development site. The construction programme is expected to last c.3.5 years.

Potential impacts of the Proposed Development

Construction Phase

European Sites

6.119 The assessment presented in the Appropriate Assessment Screening Report concluded that the potential impacts associated with the Proposed Development do not have the potential to affect the receiving environment and, consequently, do not have the potential to affect the conservation objectives supporting the qualifying interests or special conservation interests of any European sites; either alone or in combination with any other plans or projects:

- As the Proposed Development does not traverse any European sites there is no potential for habitat fragmentation to occur.

- The Proposed Development site does not support populations of any fauna species linked with the QI/SCI populations of any European site(s).
- Chapter 8 of this EIAR submitted with this application deals with the hydrology of the Proposed Development site. The chapter assesses the hydrological and hydrogeological risks associated with the Proposed Development. The assessment noted that based on the potential sources of pollution from the Proposed Development during construction and operation phases and distance of c. 20 km downstream, there is no potential for impacts to occur on European sites in Dublin Bay. This conclusion is based on a good understanding of the hydrological and hydrogeological environment, plausible sources of impact and knowledge of receptor requirements. This allows possible source-pathway-receptor linkages to be identified. Potential sources of impacts during construction and operation were considered in Chapter 8 and all potential sources of contamination were considered in relation to European sites without taking account of any measures intended to avoid or reduce harmful effects of the Proposed Development (mitigation measures) i.e. a worst-case scenario.
- The results of Chapter 8 (Hydrology) carried out by AWN indicate that surface run-off from the Proposed Development, during both construction and operational phases respectively, will not result in any perceptible impact on water quality in downstream receiving waters in Dublin Bay (and thus in the European sites therein). This is in light of expected hazard loading, dilution and attenuation within the Griffeen River, and considerable distance between the Proposed Development site and Dublin Bay.
- In line with good practice effective mitigation measures have been included in the construction design, management of construction programme and during the operational phase of the Proposed Development. However, it must be noted that these are included in the design, not for the purposes of avoiding or reducing any potential harmful effects to any European sites but are required for new developments under the under the objectives of the Greater Dublin Strategic Drainage Study and South Dublin County Council Development Plan and in line with good construction practice.
- It is an objective of the Greater Dublin Strategic Drainage Study, and the South Dublin County Council Development Plan 2016-2022, to incorporate Sustainable Urban Drainage Systems (SUDS) within new developments. The SUDS features associated with the Proposed Development are not included within the design to avoid or reduce any potential harmful effects to any European sites.
- Therefore, there is no possibility of the Proposed Development undermining the conservation objectives of any of the qualifying interests or special conservation interests of the European sites in, or associated with, Dublin Bay as a result of surface water run-off or discharges.
- Construction-related disturbance and displacement of fauna species could potentially occur within the vicinity of the Proposed Development. For mammal species such as otter, disturbance effects would not be expected to extend beyond 150m[17]. For birds, disturbance effects would not be expected to extend beyond a distance of c.300m, as noise levels associated with general construction activities would attenuate to close to background levels at that distance[18]. There are no European sites within the disturbance ZoI; the next nearest European site to the Proposed Development is c.4.1km away.

6.120 There are no habitat areas within the disturbance ZoI of the Proposed Development that support populations of qualifying interest species of nearby SACs or SPAs[19]:

- The nearest SAC designated for otter is the Wicklow Mountains SAC, c.11.4km south of the Proposed Development. The Griffeen River is a small order stream located in a different sub-catchment than the Wicklow Mountains SAC. Considering the size of otter territories in Ireland[20], and its location relative to the Wicklow Mountains SAC, any otters potentially using the Griffeen River do not form part of, or support, any SAC population.

17 This is consistent with Transport Infrastructure Ireland (TII) guidance (Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes and Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by surrounding vegetation and buildings, with the actual ZoI of construction related disturbance likely to be much less in reality.

18 The disturbance zone of influence for waterbirds is based on the relationship between the noise levels generated by general construction traffic/works (BS 5228:2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1 Noise) and the proximity of those noise levels to birds – as assessed in Cutts, N. Phelps, A. & Burdon, D. (2009) Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance, and Wright, M., Goodman, P & Cameron, T. (2010) Exploring Behavioural Responses of Shorebirds to Impulsive Noise. Wildfowl (2010) 60: 150–167. At 300m, noise levels are below 60dB or in most cases, are approaching the 50dB threshold below which no disturbance or displacement effects would arise.

19 There is a need to consider use of habitat areas outside of an SPA by SCI bird species where they support the SCI populations and the site's conservation objectives. These habitat areas can comprise alternative roosting sites, foraging areas, staging grounds or migration routes and can, but not necessarily exclusively, be situated within the immediate hinterland of the SPA, or in areas ecologically connected to it.

20 Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013) National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

- The nearest designated site for freshwater white-clawed crayfish is the Lough Lene SAC, c.61.4km north-west of the Proposed Development site. Considering that the Griffeen River and the Camac river are located in a different catchment than the Lough Lene SAC and its location relative to the Proposed Development site, freshwater white-clawed crayfish populations found in these rivers do not form part of, or support, any SAC population.
- The nearest designated site for Atlantic salmon is the River Boyne and River Blackwater SAC, c.31.7km north-west of the Proposed Development. Considering that the Griffeen River and the Camac river are located in a different catchment than the River Boyne and River Blackwater SAC and its location relative to the Proposed Development site, Atlantic salmon populations found in these rivers do not form part of, or support, any SAC population.
- The nearest SPA to the Proposed Development site designated for wintering special conservation interest species is the North Bull Island SPA, located c.15.7km east of the Proposed Development. The Proposed Development is within the normal foraging range of some SCI species of this European site, e.g. black-headed gull, however, none of these species were recorded within the Proposed Development site. The site is also beyond the normal range of other SCI species such as light-bellied Brent goose *Branta bernicla hrota*. Indeed, the nearest recorded inland feeding site for light-bellied brent geese is at Le Fanu Park, c.6.3km east of the Proposed Development, so the lands are significantly further inland than the farthest known inland feeding site for this species from Dublin Bay (Enviroguide Consulting, 2019). Furthermore, the habitats within the Proposed Development are deemed not suitable as an inland feeding habitat for light-bellied brent goose, which utilise open grassland pitches and fields with a short sward height as foraging and/or roosting habitat. Lapwing, a SCI species, was found using the Proposed Development site, however, the nearest designated site for lapwing is the Boyne Estuary SPA, c.43.9km north of the Proposed Development site, and considering its location and distance to the Proposed Development site, it is considered that lapwing recorded within the Proposed Development site do not form part of any SPA population.

6.121 Therefore, as the Proposed Development will not result in the disturbance or displacement of the qualifying or special conservation interest species of any European site, there is no potential for any in combination effects to occur in that regard.

Nationally Designated Sites

6.122 The Proposed Development boundary overlaps with the Grand Canal pNHA boundary in a small area at the north-western corner of the site, over an area of 565m^2, and the Grand Canal flows east along the entire northern margin of the site, mostly c. 5m north of the site boundary (see Figure 6.5). There are no other nationally designated sites in the immediate vicinity. The Proposed Development does not have the potential to affect the receiving environment and, consequently, does not have the potential to affect the integrity of any nationally designated site; either alone or in combination with any other plans or projects.

6.123 As the Proposed Development traverses a national site there is some potential for habitat fragmentation of a national site to occur. However, the design of the Proposed Development is such that a buffer of at least 50m exists between the hardstanding development and the Grand Canal pNHA itself. Within this buffer zone, only landscaping changes will be made, including the planting of new hedgerow and treeline habitat. Within the pNHA boundary overlap area itself, no changes at all will be made to the existing baseline condition of the land.

6.124 The Proposed Development is not hydrologically connected to the Grand Canal pNHA; however, it is connected to nationally designated sites in Dublin Bay via the Griffeen River. As there are no hydrological or hydrogeological risks associated with the Proposed Development (see Chapter 8 on hydrology), therefore there are no nationally designated sites at risk of habitat degradation.

6.125 Construction-related disturbance and displacement of fauna species could potentially occur within the vicinity of the Proposed Development site. For mammal species such as otter, disturbance effects would not be expected to extend beyond 150m[21]. For birds, disturbance effects would not be expected to extend beyond a distance of c.300m, as noise levels associated with general construction activities

21 This is consistent with Transport Infrastructure Ireland (TII) guidance (Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes and Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by surrounding vegetation and buildings, with the actual ZoI of construction related disturbance likely to be much less in reality.

would attenuate to close to background levels at that distance[22]. The Grand Canal pNHA is within the disturbance ZoI.

6.126 The Grand Canal pNHA is designated for its canal-side habitats and the diversity of species they support, and Flora Protection Order species *Groenlandia densa*, while South Dublin Bay pNHA, North Dublin Bay pNHA, Booterstown Marsh pNHA and Dolphins, Dublin Docks pNHA are designated for the presence of coastal and estuarine habitats and usage of these sites species of interest, including wintering birds, It is likely that these sites are also designated for similar reasons to those for which South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA are respectively designated. Therefore, these nationally designated sites would be subjected to the same potential impacts, or lack of described above with respect to potential impacts on European sites. In absence of mitigation, such potential impacts may result in a likely significant effect at the national geographic scale.

6.127 The Planning Scheme provides for a 30m set-back for all development from the southern side of the Grand Canal pNHA boundary, to afford the optimal degree of protection to the Grand Canal ecological corridor. In addition, the *South Dublin County Development Plan 2016-2022* (South Dublin County Council, 2016) have policies and objectives for the protection of the Grand Canal.

Introducing or spreading non-native invasive plant species

6.128 Planting, dispersing, or allowing and causing the dispersal, spread or growth of certain non-native plant species is controlled under Regulation 49 of the *European Communities (Birds and Natural Habitats) Regulations, 2011*; and refers to plant or animal species listed on the Third Schedule of those regulations. The spread of non-native invasive plant species as a result of construction works has the potential to impact upon terrestrial habitats within and immediately adjacent to the Proposed Development site boundary; potentially affecting plant species composition, diversity and abundance over the long-term. The effects of introducing such non-native invasive plant species to highly sensitive and ecologically important habitat areas (*e.g.* pNHAs) has the potential to result in a likely significant negative effect, at geographic scales ranging from local to national.

6.129 The non-native invasive species *Buddleja davidii* (currently not listed on the Third Schedule but highly invasive species nonetheless) was present within the site. Site clearance and excavation works have the potential, in the absence of mitigation, to result in the introduction and/or spread of non-native invasive species, such as *B. davidii*, either outside or within the subject lands. The potential impacts in this instance could have a local level impact if the species were to expand along the banks of the Grand Canal pNHA.

6.130 The need to control and manage non-native invasive species is highlighted in Green Infrastructure (G) Policy 2 Green Infrastructure Network, Objective 12 of the *South County Development Plan 2016-2022*.

Dust deposition

6.131 The Proposed Development has the potential to generate dust during construction works which could potentially affect the Grand Canal (and the vegetation of habitats within), which is partially within the Proposed Development boundary (see Figure 6.5) and mostly c. 5-10 metres from the red line boundary, and thus result in a significant negative effect ranging from local to national level. However, this is unlikely due to the presence of vegetation (*i.e.* hedgerows and treelines) within the buffer zone between the hardstanding development and the canal, as well as the vegetation along the banks of the canal itself, which will all provide a buffer from dust deposition between the Grand Canal pNHA and the Proposed Development.

22 The disturbance zone of influence for waterbirds is based on the relationship between the noise levels generated by general construction traffic/works (BS 5228:2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1 Noise) and the proximity of those noise levels to birds – as assessed in Cutts, N. Phelps, A & Burdon, D. (2009) Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance, and Wright, M., Goodman, P & Cameron, T. (2010) Exploring Behavioural Responses of Shorebirds to Impulsive Noise. Wildfowl (2010) 60: 150–167. At 300m, noise levels are below 60dB or, in most cases, are approaching the 50dB threshold below which no disturbance or displacement effects would arise.

Potential Impacts on Habitats and Flora

Habitat loss

6.132 Hedgerows are afforded protection in the *South Dublin County Development Plan 2016-2022* policies and objectives, such as Green Infrastructure (G) Policy 6 New Development in Urban Areas, Objective 1: "*to protect and enhance existing ecological features including tree stands, woodlands, hedgerows and watercourses in all new developments as an essential part of the design process*", and Heritage, Conservation and Landscapes (HCL) Policy 15 Non-Designated Areas, Objective 3: "*to protect existing trees, hedgerows, and woodlands which are of amenity or biodiversity value and/or contribute to landscape character and ensure that proper provision is made for their protections and management in accordance with Living with Trees: South Dublin County Council's Tree Management Policy 2015-2020*". Other relevant policies and objectives of *South Dublin County Development Plan 2016-2022* can be found in Appendix 6.5.

6.133 Construction of the Proposed Development will result in the loss of habitat area; totalling c.22.1ha in area and c.0.722km in linear habitats. None of the habitats directly affected by the Proposed Development are considered to be any greater than of local biodiversity importance (higher value).

6.134 The majority of the habitats within the Proposed Development boundary are of local biodiversity importance (lower value) and are predominantly comprised of improved agricultural grassland (c.7.8ha in total area), recolonising bare ground (c.2.6ha in total area), buildings and artificial surfaces (c.0.63ha in total area) and drainage ditches (993m in length). The loss or modification of habitats of local biodiversity importance (lower value) will not result in a likely significant effect on biodiversity.

6.135 The habitat types within the Proposed Development boundary, and the area of each, that are of local importance (higher value) are:

- Hedgerows (WL1) – c.1.39km; 0.371km of which is to be removed.
- Treelines (WL2) – c.0.688km; 0.128km of which is to be removed.
- Dry meadows and grassy verges (GS2) – c.11.2ha, all of which is to be removed.

6.136 Substantial portions of these habitats will be removed (and/or replaced with landscape planting or wildflower hay meadows), where they fall within the footprint of the Proposed Development, however, much of the existing hedgerow/treeline habitat within the site will be retained as they currently are. Although the area removed to facilitate construction of the Proposed Development is relatively large, the loss of these habitat types is significant albeit at the local scale only. The mitigation measures proposed for this impact are summarised in Table 6.5.

Introducing or spreading non-native invasive plant species

6.137 Planting, dispersing, or allowing and causing the dispersal, spread or growth of certain non-native plant species is controlled under Regulation 49 of the *European Communities (Birds and Natural Habitats) Regulations, 2011*; and refers to plant or animal species listed on the Third Schedule of those regulations. The accidental spread of non-native invasive plant species as a result of construction works has the potential to impact upon terrestrial habitats within and immediately adjacent to the Proposed Development site boundary; potentially affecting plant species composition, diversity and abundance over the long-term. The effects of introducing such non-native invasive plant species to sensitive and ecologically important habitat areas (*e.g.* areas of local importance (higher value)) has the potential to result in a likely significant negative effect, at geographic scales ranging from local to national.

6.138 The non-native invasive *B. davidii* (currently not listed on the Third Schedule, however a highly invasive species nonetheless) was present in the site. Site clearance and excavation works have the potential, in the absence of mitigation, to result in the introduction and/or spread of non-native invasive species, such as *B. davidii*, either within the subject lands or off-site. The potential impacts in this instance could have local to national level impact depending on if the species were to expand to the Grand Canal pNHA and spread further on.

Potential Impacts on Fauna

Badger

6.139 No evidence of badgers was recorded within the Proposed Development site. However, considering this and the presence of suitable breeding, foraging and commuting habitat for badgers, the Proposed Development site has the potential to be utilised by badger. The construction of the Proposed Development will reduce the amount of semi-natural habitat available to local badger populations and potentially fragment habitat corridors used by badger. Considering the absence of evidence of badger use of the Proposed Development site, the overall abundance of suitable habitat in the environs and particularly to the west of the site, and that a naturalised buffer zone will remain in place on site adjacent to the Grand Canal, the Proposed Development will not result in a significant impact on badgers at any geographical scale.

Small mammals

6.140 The Proposed Development site contains suitable foraging, commuting and breeding habitat for hedgehogs and pygmy shrews, and commuting opportunities for other small mammals. The construction of a development will disconnect habitat corridors and reduce the amount of semi-natural habitat available to local small mammal populations; however, the overall area of habitat loss is small, especially when considered in the context of the abundance of available suitable habitat in the surrounding environment and particularly in the lands to the west, and a naturalised buffer zone will remain in place on site adjacent to the Grand Canal. Therefore, the Proposed Development will not result in a significant impact on small mammals at any geographical scale.

Breeding birds

6.141 In the absence of mitigation to protect birds and their nests, there is potential for direct impacts on breeding birds due to loss of suitable breeding bird habitat and/or the risk of direct mortality and injury to birds, which may arise from the clearance of vegetation within the Proposed Development site. This potential impact would be most likely to arise if clearance works are undertaken during the time of year when birds are likely to be nesting (*i.e.* 1st March to 31st August, inclusive).

6.142 The bird species recorded at the Proposed Development site during surveys include those that are commonly found in suburban and urban habitats (*e.g.* blackbird, hooded crow, robin and wren). These habitats include hedgerows, treelines and grasslands, which can be found in the wider surrounding area, such as to the west of the Proposed Development site. A total of 15 of the 22 species recorded were BoCCI Green-listed species and are considered to be of least conservation concern (Colhoun & Cummins, 2013). Six of the BoCCI Amber-and Red-listed species recorded within the Proposed Development site are also likely to occur in these commonly found habitats (*i.e.* skylark, meadow pipit, linnet, snipe, robin and tree sparrow).

6.143 The clearance of vegetation may result in a loss of breeding bird habitat, however considering that the extent of this loss is limited to c.22.1ha in area and c.0.722km in linear habitats and considering the amount of suitable foraging habitat located within the wider environs, the habitat loss will result in a significant negative effect on the populations of bird species at local scale only. Under the Wildlife Acts, it is an offence to disturb birds while on their nests, or to wilfully take, remove, destroy, injure or mutilate their eggs or nests. Mitigation measures have been provided to ensure adherence to the Wildlife Acts.

Raptors

6.144 The Green-listed raptor species buzzard was recorded within the Proposed Development site. This species is associated with a variety of habitats, which commonly include agricultural and unmanaged grassland, hedgerows and treelines. The Proposed Development will result in a loss of hunting habitat for this species. The Proposed Development will also create a barrier across the previously undeveloped lands.

6.145 Although there could potentially be a short-term impact on the local populations of raptors, as a consequence of the clearance of vegetation which may impact their prey availability, this will not result in a significant negative effect on the populations of these species at any geographic scale.

Wintering birds

6.146 Amber-listed snipe and Red-listed lapwing were recorded within the Proposed Development site during the bird surveys. Only lapwing is an SCI species of a European site. Lapwings prefer open, relatively short grassland and arable fields for foraging, whereas snipe can be found in rough grassland. The arable field habitat on which the lapwing were recorded no longer occurs within the site.

6.147 The clearance of vegetation may result in a loss of sub-optimal foraging and/or roosting habitat of snipe (and perhaps lapwing, although their favoured habitat on site no longer occurs), however considering that the extent of this loss is limited to c.11.2ha, the habitat loss will result in a significant negative effect on the populations of these species at local scale only.

Bats

6.148 Bats, and their breeding and resting places, are strictly protected under the Birds and Habitats Regulations, and under the Wildlife Acts, and it is an offence under that legislation to kill or injure bats or to interfere with or destroy their breeding or resting places. There are six trees with suitability for bat tree roost sites present within the Proposed Development site and as such there is potential for direct impacts on roosting bats to occur as a consequence of vegetation removal and/or works associated with the Proposed Development.

6.149 According to the NBDC database, there are records of five bat species within c. 2km of the Proposed Development, *i.e.* brown long-eared bat, common pipistrelle, Daubenton's bat, Leisler's and soprano pipistrelle (see pages 67-70 of this EIA Report for more details on the locations of these records). During activity surveys, bat species were recorded foraging and commuting within the Proposed Development site, but at relatively low levels, concentrated along the hedgerows and grasslands within the buffer zone near the Grand Canal. A total of three common bat species were recorded (*i.e.* common pipistrelle, Leisler's, soprano pipistrelle); all of which are of "Least concern" (Nelson *et al.*, 2019). Considering that the majority of bat activity is generally concentrated in unlit areas, there is potential for direct impacts on foraging and commuting bats from increased light levels during construction in e.g. along the hedgerows and treelines. However, the impact is considered to be insignificant on the local bat populations due to working hours being restricted to day-time when there is no requirement for lighting in the summer, and due to bats hibernating during winter months when there is a more significant requirement for lighting during construction. The clearance of vegetation may result in a loss of bat foraging habitat, however considering that the extent of this loss is limited to c.22.1ha in area and c.0.722km in linear habitats and considering the amount of suitable foraging/commuting habitat located within the wider environs and particularly to the west of the site, the habitat loss will result in a significant negative effect on the populations of bat species at a local scale only.

Common Frog

6.150 There is potential for direct impacts on individual common frogs due to the loss of suitable habitat and/or the risk of direct mortality and injury, which may arise from the clearance of vegetation within the Proposed Development site, however, these impacts will not affect local populations at any significant geographic level. The Proposed Development will result in the permanent loss of suitable common frog habitat (*e.g.* grassland); however, there is suitable breeding and foraging habitat located in the wider area within the wider environs. In consideration of this and that the majority of suitable breeding habitat to be lost is ephemeral in nature, the potential loss of habitat will not result in a significant negative effect on common frog populations at any geographic scale

6.151 Common frog is protected under the Wildlife Acts and it is an offence to hunt, take or kill them, or wilfully to interfere with or destroy their breeding places. Mitigation measures have been provided to ensure adherence to the Wildlife Acts.

Common lizard

6.152 The Wildlife Acts provide protection to Ireland's only reptile species, common lizard. It is an offence to hunt, take or kill them, or wilfully to interfere with or destroy their breeding places. In the absence of mitigation to protect common lizards during construction, there is potential for direct impacts on

common lizards due to the loss of suitable habitat within the Proposed Development footprint, and/or the risk of direct mortality and injury to common lizards, which may arise from the site clearance of suitable habitats within the Proposed Development site. Due to common lizard being a mobile species, and the amount of suitable habitat in the wider environs, the risk of disturbance and mortality is not considered significant at any geographic level.

Fish

6.153 There is no potential for direct impacts on individual fish due to loss of suitable habitat and/or the risk of direct mortality and injury. Therefore, the risk of disturbance and mortality is not considered to significantly affect local populations at any geographic level.

White-clawed crayfish

6.154 There is no potential for direct impacts on individual white-clawed crayfish due to loss of suitable habitat and/or the risk of direct mortality and injury. Therefore, the risk of disturbance and mortality is not considered to significantly affect local populations at any geographic level.

Potential Impacts Arising from Disturbance or Displacement

6.155 Construction-related disturbance and displacement of fauna species could potentially occur within the vicinity of the Proposed Development. For mammal species such as otter, disturbance effects would not be expected to extend beyond 150m[23]. For birds, disturbance effects would not be expected to extend beyond a distance of c.300m, as noise levels associated with general construction activities would attenuate to close to background levels at that distance[24].

Badger

6.156 While the Proposed Development will result in increased human presence on site, the potential effects on badgers in the environs from construction works are not significant in this instance. This is because the proposed works will be largely confined to daylight hours, when badgers are least likely to forage within the Proposed Development site. Even in the event that the construction phase of the proposal coincides with construction of other projects in the immediate vicinity, there will be no significant disturbance or displacement effects on badgers, as there are large areas of suitable habitat in the wider environs towards the west of the Proposed Development site. Badgers are widespread in Ireland and found in close proximity to human settlements, including in Dublin City, and therefore are likely to adapt to the temporary changes in human activity levels in the Proposed Development site and surrounding area. Disturbance or displacement during construction is therefore unlikely to result in a significant negative effect, at any geographic scale.

Otter

6.157 The Grand Canal, the Griffeen River, the Camac River, the River Liffey and adjacent waterbodies are likely to form a part of the territories of local otter populations based on desktop records of otter and recent observations from Scott Cawley field workers. The only waterbody immediately adjacent to the Proposed Development, the Griffeen River, a tributary of the River Liffey, is likely to be used by commuting and/or foraging otters. The potential effects on otters in terms of disturbance from the Proposed Development are not significant in this instance. This is because, the proposed construction works are limited in terms of scale and duration (c.3.5 years) and works will largely be confined to daylight hours, when otters are least likely to forage along the river and the canal corridors.

[23] This is consistent with Transport Infrastructure Ireland (TII) guidance (*Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes* and *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes*) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by surrounding vegetation and buildings, with the actual ZoI of construction related disturbance likely to be much less in reality.

[24] The disturbance zone of influence for waterbirds is based on the relationship between the noise levels generated by general construction traffic/works (BS 5228:2009 *Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1 Noise*) and the proximity of those noise levels to birds – as assessed in Cutts, N. Phelps, A. & Burdon, D. (2009*) Construction and Waterfowl: Defining Sensitivity, Response. Impacts and Guidance*, and Wright, M., Goodman. P & Cameron, T. (2010) *Exploring Behavioural Responses of Shorebirds to Impulsive Noise*. Wildfowl (2010) 60: 150–167. At 300m, noise levels are below 60dB or, in most cases, are approaching the 50dB threshold below which no disturbance or displacement effects would arise.

Additionally, as the Griffeen River runs through some already built up environment, and it is anticipated that the local population of otters will be habituated to a certain level of human disturbance. Disturbance/displacement during construction therefore is unlikely to result in a significant negative effect, at any geographic scale.

Small mammals

6.158 In conjunction with any displacement effects associated with habitat loss, increased human presence and/or noise and vibration associated with construction works, has the potential to displace small mammals from both breeding and resting places and from foraging habitat. However, given the limited potential for the majority of the site to support any locally significant small mammal populations, and disturbance will be short -term (c.3.5 years), it is extremely unlikely to result in any long-term effects on the local small mammal populations or their conservation status. Disturbance or displacement during construction therefore is unlikely to result in a significant negative effect, at any geographic scale.

Breeding Birds

6.159 The construction of the Proposed Development will result in a short-term increase in construction-related noise and vibration and human disturbance over a construction period of c.3.5 years. This could potentially result in a short-term reduction in the breeding success of birds that utilise suitable breeding habitat in the locality of the Proposed Development site, such as Red-listed meadow pipit, whose breeding populations have seen national short-term decline of more than 50%[2]. Meadow pipits use rough grasslands for breeding and will be one of the most impacted species in terms of areas of suitable breeding habitat (c.11.2ha) being disturbed and either lost or replaced.

6.160 The Amber-listed species (e.g. skylark, linnet, snipe, robin and tree sparrow) recorded within the Proposed Development site, have similarly seen short-term declines in their populations, although not to the same extent as those on the Red-list[2]. The smaller passerines rely on hedgerows, as well as woodland, for breeding. Given the existing background noise in the surrounding urban environment and similar habitats found in the surroundings within the wider environs, it will not result in a significant negative effect on the populations of these bird species at any geographic scale.

Raptors

6.161 The impacts of construction of the Proposed Development will result in similar temporary impacts associated with temporary increase in construction-related noise and vibration and human disturbance over a construction period of c.3.5 years on raptors. This could potentially result in a short-term displacement of raptors within the Proposed Development site, and birds utilising similar foraging habitat in the surrounding areas up to *c.*300m of the Proposed Development. However, as this potential impact would be short-term in nature, and given the existing background noise in the surrounding semi-urban and agricultural environment, it will not result in a significant negative effect on the populations of raptors at any geographic scale.

Wintering Birds

6.162 The impacts of construction of the Proposed Development will result in similar impacts associated with increase in construction-related noise and vibration and human disturbance over a construction period of c.3.5 years on wintering birds. This could potentially result in a medium-term displacement of foraging and/or roosting wintering birds within the Proposed Development site, and birds utilising similar foraging habitat in the surrounding areas up to *c.*300m of the Proposed Development. However, considering the mostly small numbers of wintering birds using the Proposed Development site (snipe, maximum count: 3 individuals) (with the exception of lapwing, a flock of c.300 birds were recorded on site), given the fact that the arable field habitat which was utilised by lapwing and snipe is now gone from the site, and given the existing background noise in the surrounding semi-urban and agricultural environment, it will not result in a significant negative effect on the populations of these bird species at any geographic scale.

Bats

6.163 Temporary artificial lighting associated with the construction works will further illuminate the site and its immediate environs. In absence of mitigation, this could potentially displace bats foraging and/or commuting bats from the lands within the Proposed Development site and in the locality. In consideration of the nature of the surrounding environment (*i.e.* semi-urban) and the fact that any artificial lighting during construction would be temporary and the site is partially lit by the Newcastle Road to the immediate east of the site, it is considered that the Proposed Development will not result in a significant negative effect on local bat populations at any geographical scale. As a precaution, lighting mitigation has been provided to minimise any effect on individual bats during construction.

Common Frog

6.164 Displacement effects associated with habitat loss, increased human presence and/or noise and vibration associated with construction works, has the potential to displace individual common frog from the Proposed Development site. However, given that disturbance will be short/medium-term (c.18 months), it is extremely unlikely that disturbance related impacts as a consequence of the Proposed Development will result in any long-term effects on local common frog populations or their conservation status. Disturbance or displacement during construction is unlikely to result in a significant negative effect, at any geographic scale.

Common Lizard

6.165 Displacement effects associated with habitat loss, increased human presence and/or noise and vibration associated with construction works, has the potential to displace individual common lizards from the Proposed Development site. However, given that the disturbance will be short/medium-term, it is extremely unlikely that disturbance related impacts as a consequence of the Proposed Development will result in any long-term effects on their local populations or their conservation status. Disturbance or displacement during construction is unlikely to result in a significant negative effect, at any geographic scale.

Potential Impacts of Surface Water Pollutants on Prey Availability

Otter

6.166 In the absence of any mitigation, there is potential for a pollutant event during the construction phase of the Proposed Development to result in a fish kill, and therefore affect prey availability in waterbodies located in the immediate environs (*i.e.* the Griffeen River). The effects on prey availability could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Liffey sub-catchment. The effects on otter would be significant, likely at the local geographic level only.

Potential Impacts of Surface Water Pollutants

Fish

6.167 In the absence of any mitigation, there is potential for a pollutant event during the construction phase of the Proposed Development to result in a fish kill within the waterbodies located in the immediate environs (*i.e.* the Griffeen River). The effects on fish could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Liffey sub-catchment. The effects on fish would be significant, likely at the local geographic level only.

Freshwater White-clawed Crayfish

6.168 In the absence of any mitigation, there is potential for a pollutant event during the construction phase of the Proposed Development to result in mortality of freshwater white-clawed crayfish in the waterbodies located in the immediate environs (*i.e.* the Griffeen River). The effects of mortality on freshwater white-clawed crayfish could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Liffey sub-catchment. The effects on freshwater white-clawed crayfish would be significant, likely at the local geographic level only.

Operational Phase

Potential Impacts on Designated Sites

European Sites

6.169 The assessment presented in the Appropriate Assessment Screening Report concluded that the potential impacts associated with the Proposed Development do not have the potential to affect the receiving environment and, consequently, do not have the potential to affect the conservation objectives supporting the qualifying interests or special conservation interests of any European sites; either alone or in combination with any other plans or projects.

Surface Water

6.170 Chapter 8 of this EIAR submitted with this application deals with the hydrology of the Proposed Development site. The chapter assesses the hydrological and hydrogeological risks associated with the Proposed Development. The assessment noted that based on the potential sources of pollution from the Proposed Development during construction and operation phases and distance of c. 20 km downstream, there is no potential for impacts to occur on European sites in Dublin Bay. This conclusion is based on a good understanding of the hydrological and hydrogeological environment, plausible sources of impact and knowledge of receptor requirements. This allows possible source-pathway-receptor linkages to be identified. Potential sources of impacts during construction and operation were considered in Chapter 8 and all potential sources of contamination were considered in relation to European sites without taking account of any measures intended to avoid or reduce harmful effects of the Proposed Development (mitigation measures) i.e. a worst-case scenario.

6.171 The results of Chapter 8 carried out by AWN indicate that surface run-off from the Proposed Development, during both construction and operational phases respectively, will not result in any impact on water quality in downstream receiving waters in Dublin Bay (and thus in the European sites therein). This is in light of expected hazard loading, dilution and attenuation within the Griffeen River, and considerable distance between the Proposed Development site and Dublin Bay.

6.172 In line with good practice effective mitigation measures have been included in the construction design, management of construction programme and during the operational phase of the Proposed Development. However, it must be noted that these are included in the design, not for the purposes of avoiding or reducing any potential harmful effects to any European sites but are required for new developments under the under the objectives of the Greater Dublin Strategic Drainage Study and South Dublin County Council Development Plan and in line with good construction practice.

6.173 It is an objective of the Greater Dublin Strategic Drainage Study, and the South Dublin County Council Development Plan 2016-2022, to incorporate Sustainable Urban Drainage Systems (SUDS) within new developments. The SUDS features associated with the Proposed Development are not included within the design to avoid or reduce any potential harmful effects to any European sites.

6.174 Therefore, there is no possibility of the Proposed Development undermining the conservation objectives of any of the qualifying interests or special conservation interests of the European sites in, or associated with, Dublin Bay as a result of surface water run-off or discharges.

Foul Water

6.175 Foul water, comprising sewage and industrial effluent (and some surface water run-off), from the Dublin area has historically been, and will continue to be, treated at Ringsend WWTP prior to discharge to Dublin Bay. The most recent information from Irish Water indicates that the plant is operating above its capacity of 1.64 million P.E.[25], with a current operational loading of *c.* 2.2 million P.E. Ringsend WWTP operates under a discharge licence from the EPA (D0034-01) and must comply with the licence conditions.

[25] Irish Water (2017) *Annual Environmental Report.* Accessed from http://www.epa.ie/licences/lic_eDMS 090151b280672a63.pdf

6.176 Despite the capacity issues associated with the Ringsend WWTP, the Liffey Estuary Lower and Dublin Bay are currently classified by the EPA as being of "Unpolluted" water quality status[26]. The Tolka Estuary is currently classified by the EPA as being "Potentially Eutrophic". The pollutant content of future foul water discharges to Dublin Bay is considered likely to decrease in the long-term for the following reasons:

- An Bord Pleanála granted planning permission for an upgrade to the Ringsend WWTP in April 2019[27], which will increase capacity at the plant, and
- There is a commitment in the National Development Plan 2018-2027[28] to invest in and progress the Greater Dublin Drainage Project which will involve the provision of a new regional wastewater treatment plant at a site in the northern part of the Greater Dublin Area and the provision of a new Orbital Drainage Sewer linking the new plant to the existing regional sewer network, which will enable future connections for identified areas of development within the catchment area. The provision of the Greater Dublin Drainage Project will augment the wastewater treatment capacity currently provided by Ringsend WWTP across the Greater Dublin Area.

6.177 It is also an objective of the Greater Dublin Strategic Drainage Study, and all development plans within the catchment of Ringsend WWTP, to include Sustainable Urban Drainage Systems (SUDS) within new developments. The relevant development plans also have protective policies/objectives in place to protect water quality in the receiving freshwater and marine environments, and to implement the Water Framework Directive in achieving good water quality status for Dublin Bay.

6.178 Considering the above, particularly the current unpolluted status of Dublin Bay, and that foul water discharges from the Proposed Development would equate to a very small percentage of the overall discharge volumes sent to Ringsend WWTP for treatment, it is concluded that the Proposed Development will not impact on the overall water quality status of Dublin Bay.

6.179 Therefore, there is no possibility of the Proposed Development undermining the conservation objectives of any of the qualifying interests or special conservation interests of the European sites in, or associated with, Dublin Bay as a result of foul water discharges.

Nationally Designated Sites

6.180 Nationally designated sites would be subjected to the same potential impacts from operational stage described above with respect to potential impacts on European sites. In absence of mitigation, such potential impacts may result in a likely significant effect at the national geographic scale. The boundary of the Grand Canal pNHA is located partially within the development site in a small area at its north-western corner (see Figure 6.5). Within this pNHA boundary overlap area, no changes at all will be made to the existing baseline condition of the land. Furthermore, as there are no hydrological connections between the canal and the Proposed Development site, there is no pathway for potential impacts to occur.

Dust deposition

6.181 The Proposed Development has the potential to generate dust during the operational stage from traffic which could potentially affect the Grand Canal (and the vegetation of habitats within), which is partially within the Proposed Development boundary (see Figure 6.5) and mostly c. 5-10 metres from the red line boundary, and thus result in a significant negative effect ranging from local to national level. However, this is unlikely due to the presence of vegetation (*i.e.* hedgerows and treelines) within the buffer zone between the hardstanding development and the canal, as well as the vegetation along the banks of the canal itself, which will all provide a buffer from dust deposition between the Grand Canal pNHA and the Proposed Development.

[26] Transitional and Coastal Surface Water Quality data (2010-2012) accessed from the EPA Envision Mapviewer www.gis.epa.ie/Envision (accessed May 2019)
[27] An Bord Pleanála Case Reference PL29S.301798 – *10-year permission for development of the Ringsend wastewater treatment plant upgrade project including a regional bio solids storage facility.* Available online at www.pleanala.ie/casenum/301798.htm.
[28] Government of Ireland (2018) *Project Ireland 2040, National Development Plan 2018-2027.*

Potential Impacts on Habitats and Flora

6.182 The majority of the habitats within the Proposed Development site (with the exception of the northern buffer area near to the Grand Canal) will be either removed or replaced prior to operation of the Proposed Development. The primary remaining sensitive habitats located within the Proposed Development site are the hedgerows and treelines that are to be retained, as well as the Grand Canal itself which lies at the northern margin of the development. Refer to "Potential Impacts on Designated Sites" above with regards to potential impacts during operation on downstream sensitive habitats located within the boundaries of protected designated sites. In consideration of this, the Proposed Development will not result in a significant negative effect on habitats within the Proposed Development site at any geographical scale as a consequence of surface water degradation.

Potential Impacts on Fauna

Otter

6.183 In the absence of any mitigation, there is potential for a pollutant event during the operational phases of the Proposed Development to result in a fish kill, and therefore affect prey availability within waterbodies located in the immediate environs (*i.e.* the Griffeen River). The effects on prey availability could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Liffey sub-catchment. The effects on otter would be significant, likely at the local geographic level only.

Birds

6.184 The Proposed Development during operation will likely result in a significant increase in levels of noise and human disturbance at the Proposed Development site from those levels currently present at the existing site. Therefore, there may be potential impacts on birds as a consequence of noise and/or human disturbance, albeit at a local geographic scale.

Bats

6.185 In absence of mitigation, permanent artificial lighting associated with the operation of the Proposed Development could potentially displace foraging and/or commuting bats from the lands within the Proposed Development site. The wider surrounding lands are urban in nature towards the east and partially urban to the north. A precautionary approach has been adopted and it is considered that, in the absence of mitigation, the potential displacement of bats from the Proposed Development site as a consequence of artificial lighting could potentially have a negative significant effect in the long-term on bat populations at a local geographic scale.

6.186 Furthermore, the Proposed Development during operation will likely result in a significant increase in levels of noise and human disturbance at the Proposed Development site from those levels currently present at the existing site. Therefore, there may be potential impacts on birds as a consequence of noise and/or human disturbance, albeit at a local geographic scale.

Fish

6.187 In the absence of any mitigation, there is potential for a pollutant event during the operation phase of the Proposed Development to result in mortality of fish in waterbodies located in the immediate environs (*i.e.* the Griffeen River). The effects on mortality on fish could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Liffey sub-catchment. The effects on fish would be significant, likely at the local geographic level only.

Freshwater white-clawed crayfish

6.188 In the absence of any mitigation, there is potential for a pollutant event during the operation phase of the Proposed Development to result in mortality of freshwater white-clawed crayfish in waterbodies located in the immediate environs (*i.e.* the Griffeen River). The effects on mortality on freshwater white-clawed crayfish could be amplified should a pollution episode coincide with a pollution event triggered by other plans, projects, or land use activities in the Liffey sub-catchment. The effects on freshwater white-clawed crayfish would be significant, likely at the local geographic level only.

Do-Nothing Impact

6.189 The continuation of the existing management practices at the Proposed Development site in a "do-nothing" scenario, would maintain the current habitats present; however, it is likely that the unmanaged dry meadows and grassy verges (GS2) habitat on site would continue to spread and overcome the improved agricultural grassland (GA1) and recolonising bare ground (ED3) over time. The Proposed Development site would continue to provide suitable foraging and breeding habitat for bird and small mammal species and suitable foraging habitat for common bat species. The downstream waterbodies would continue to sustain fish and freshwater white-clawed crayfish populations and otters feeding on them. The lands are currently zoned under the South Dublin County Development Plan 2016-2022 for '*EE – Enterprise and Employment*' with a small area at the northern end of the site near the Grand Canal zoned as '*RU*', and so the majority of the lands would likely be developed for industrial or enterprise purposes in the future.

Remedial and Mitigation Measures

Construction Phase

Nationally Designated Sites

Non-native invasive species

6.190 The following mitigation measures will ensure that there will be no impacts from non-native invasive species on the adjacent Grand Canal pNHA. It is recommended that *Buddleia davidii* is removed prior to construction works onsite.

6.191 *Buddleja davidii* is a highly invasive species that is widespread in urban environments. It can grow in very poor, shallow soil, along railways and even on walls and buildings. Each plant can produce up to three million seeds that can remain viable in the soil for many years. It creates competition for resources such as pollinators, light and space and poses a threat to native plant species within the lands.

6.192 There are two options for the removal and control of *B. davidii*[29]. The first option is for the physical removal of *B. davidii* is only suitable for very small infestations of this species. If this is the chosen method of removal, care should be taken to remove all parts of the plant as branches are capable of re-rooting from cuttings. The plants should not be removed when in seed as there would be a risk of spreading the seeds further. Where removal of mature plants is not immediately feasible, the flower heads should be removed in June before they go to seed. It is essential to plant the ground with native species immediately following removal to prevent new seedlings taking hold.

6.193 The second option is to cut back the plants to a stump during active growth (late spring to early summer) and then immediately treated with a systemic weed killer (brushed on). Foliar application of herbicide may be adequate for smaller infestations of younger plants but must be followed up on a six-monthly basis. The measures outlined above to control the spread of the non-native invasive species *B. davidii* will also mitigate against their spread within the habitats in the Proposed Development site.

Habitats

Water quality

6.194 The following mitigation measures will ensure there are no impacts on water quality in the immediate vicinity of the Proposed Development from release of hydrocarbons, polluting chemicals, sediment/silt and contaminated waters control during the construction stage of the Proposed Development and therefore no potential impacts on the downstream receiving water courses, *i.e.* the Griffeen River:

[29] Any information provided on the use of chemicals is given on the understanding that it is a recognised treatment option, dependant on a number of criteria. Under the provisions of Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides, advice on the use of particular pesticides and their applications must only be delivered by a qualified Pesticide Advisor. appropriately trained and registered with the Department of Agriculture, Food and the Marine.

- Specific measures to prevent the release of sediment over baseline conditions to the existing surface water drainage network, during the construction work, which will be implemented as the need arises. These measures include, but are not limited to, the use of silt fences, silt curtains, settlement lagoons and filter materials.
- Provision of exclusion zones and barriers (e.g. silt fences) between earthworks, stockpiles and temporary surfaces to prevent sediment washing into the existing drainage systems and hence the downstream receiving water environment.
- Provision of temporary construction surface drainage and sediment control measures to be in place before earthworks commence.
- Weather conditions will be taken into account when planning construction activities to minimise risk of run-off from the site.
- Prevailing weather and environmental conditions will be taken into account prior to the pouring of cementitious materials for the works adjacent to any surface water drainage features, or drainage features connected to same. Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete will not be discharged to existing surface water drainage systems. Concrete washout areas will be located remote any surface water drainage features, where feasible, to avoid accidental discharge to watercourses. Washing out of any concrete trucks on site will be avoided (dry brush shoots will be used instead).
- Any fuels of chemicals (including hydrocarbons or any polluting chemicals) will be stored in a designated, secure bunded area(s) to prevent any seepage of potential pollutants into the local surface water network. These designated areas will be clearly sign-posted and all personnel on site will be made aware of their locations and associated risks.
- All mobile fuel bowsers shall carry a spill kit and operatives must have spill response training. All fuel containing equipment such as portable generators shall be placed on drip trays. All fuels and chemicals required to be stored on-site will be clearly marked. Care and attention should be taken during refuelling and maintenance operations. Particular attention should be paid to gradient and ground conditions, which could increase risk of discharge to waters.
- A register of all hazardous substances, which will either be used on site or expected to be present (in the form of soil and/or groundwater contamination) will be established and maintained. This register will be available at all times and shall include as a minimum:
  - Valid Safety Data Sheets;
  - Health & Safety, Environmental controls to be implemented when storing, handling,
  - using and in the event of spillage of materials;
  - Emergency response procedures/precautions for each material; and,
  - The Personal Protective Equipment (PPE) required when using the material.
  - Implementation of response measures to potential pollution incidents.
- Robust and appropriate Spill Response Plan and Environmental Emergency Plan will be prepared prior to works commencing and they will be communicated, resourced and implemented for the duration of the works. Emergency procedures/precautions and spillage kits will be available and construction staff will be trained and experienced in emergency procedures in the event of accidental fuel spillages.
- All trucks will have a built-on tarpaulin that will cover excavated material as it is being hauled off-site and wheel wash facilities will be provided at all site egress points.
- Water supplies shall be recycled for use in the wheel wash. All waters shall be drained through appropriate filter material prior to discharge from the construction sites.
- The removal of any made ground material, which may be contaminated, from the construction site and transportation to an appropriate licenced facility shall be carried out in accordance with the Waste Management Act, best practice and guidelines for same.
- A discovery procedure for contaminated material will be prepared and adopted by the appointed contractor prior to excavation works commencing on site. These documents will detail how potentially contaminated material will be dealt with during the excavation phase.
- Implementation of measures to minimise waste and ensure correct handling, storage and disposal of waste (most notably wet concrete, pile arisings and asphalt).
- All of the above measures implemented on site will be monitored throughout the duration of construction to ensure that they are working effectively, to implement maintenance measures if required and applicable, and to address any potential issues that may arise.

Birds

Vegetation clearance/demolition of a structure

6.195 The following mitigation measures are proposed to comply with the legal protection afforded to breeding birds and their nests under the Wildlife Acts:

- In order to avoid disturbance or harm to breeding birds, their nests, eggs and/or their unflown young, all works involving the removal of trees, hedgerows, grasslands or the demolition of the structure will be undertaken outside of the nesting season (i.e. 1 March to 31 August inclusive); or where this seasonal restriction cannot be observed then:
- A breeding bird survey will be undertaken by a suitably experienced ecologist in order to assess whether birds are nesting within suitable habitat affected by or immediately adjacent to the proposed works. Should nesting birds be encountered during surveys, it may be necessary to delay the removal of trees or hedgerows or the demolition of the buildings until after the nesting season (i.e. 1 March to 31 August inclusive), or until the chicks have fully fledged.

Bats

Lighting

6.196 During construction, any external lighting to be installed, including facilitating night-time working or security lighting, on the site shall be sensitive to the presence of bats in the area, downlighting, and time limited where possible. Lighting of sensitive wildlife areas and primary ecological corridors (*e.g.* Grand Canal) and light pollution in general should be avoided. Lighting of the site during construction is designed in accordance with the following guidance:

- Guidance Notes for the Reduction of Obtrusive Light GN01 (Institute of Lighting Professionals, 2020)
- Bats & Lighting - Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland, December 2010)
- Bats and Lighting in the UK – Bats and the Built Environment Series (Bat Conservation Trust UK, January 2008).

Vegetation Clearance

6.197 The following mitigation measures are proposed in relation to those trees identified as having potential to support roosting bats (see Figure 6.15). Bats could occupy suitable roosting features at any time prior to the commencement of works. Therefore, there is an inherent risk that bats could be affected by felling works. The following mitigation procedures will be followed:

- Felling of potential tree roosts will be undertaken during the periods April to May or September to October as during this period bats are capable of flight and may avoid the risks from tree felling if proper measures are undertaken, but also are neither breeding nor in hibernation
- Use of detectors alone may not be sufficient to record bat emergence and re-entry in darkness. Therefore, prior to felling of confirmed and potential tree roosts, an emergence survey using infra-red illumination and video camera(s) and bat detectors will be carried out on the night immediately preceding the felling operation to determine if bats are present
- Where it is safe and appropriate to do so for both bats and humans, such trees may be felled using heavy plant to push over the tree. In order to ensure the optimum warning for any roosting bats that may still be present, the tree will be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. The tree should then be pushed to the ground slowly and should remain in place until it is inspected by a bat specialist
- Trees should only be felled "in section" where the sections can be rigged to avoid sudden movements or jarring of the sections
- Where remedial works (e.g. pruning of limbs) is to be undertaken to trees deemed to be suitable for bats, the affected sections of the tree will be checked by a bat specialist (using endoscope under a separate derogation licence held by that individual) for potential roost features before removal. For limbs containing potential roost features high in the tree canopy, this will necessitate the rigging and lowering of the limb to the ground (with the potential roost feature intact) for inspection by the bat specialist before it is cut up or mulched. If bats are found to be present, they will be removed by a bat specialist licenced to handle bats and released in the area in the evening following capture

- If any bat tree roosts are confirmed, and will be removed by the proposed felling works, then a derogation licence will be required from the NPWS and appropriate alternative roosting sites will be provided in the form of bat boxes.

Common Frog

6.198 If works to clear any of the habitat features suitable to support common frog are to begin during the season where frogspawn or tadpoles may be present (*i.e.* February to mid-summer), a pre-construction survey will be undertaken to determine whether breeding common frogs are present. If required, a licence permitting their removal should be applied for from the NPWS. Any frog spawn, tadpoles, juvenile or adult frogs present will be captured and removed from affected habitat by hand net and translocated to suitable alternative habitat within the environs of the site. Any capture and translocation works shall be undertaken immediately in advance of site clearance and construction works commencing.

Fish and White-clawed Crayfish

6.199 Mitigation measures outlined above for the protection of water quality in the downstream receiving water courses, *i.e.* Griffeen River, and its immediate environs will mitigate against impacts of water pollution on fish and white-clawed crayfish during construction stage.

Badgers

6.200 Before works to clear any of the habitat features suitable to supporting badgers commence, a pre-construction survey will be undertaken to determine whether badgers are present on site. If required, a licence permitting their filming to assess locations of activity and their subsequent removal should be applied for from the NPWS. Any active badger setts located within the development or 30m from the development must be safely closed with the use of one-way badger gates and (infra-red camera) monitoring to ensure that all badgers have left the sett(s) and that it is no longer occupied, prior to sett removal. Any sett closing works shall be undertaken between the months of July to November inclusive (to avoid peak breeding season for this species and therefore avoid risk of disturbance to or mortality of cubs), in advance of site clearance and construction works commencing.

Operational phase

Habitats

6.201 The landscape plans (see Chapter 11) of the Proposed Development site will implement appropriate measures such as using plants of native origin in planting/meadows and by leaving unmanaged and/or enhanced areas for biodiversity. To offset the loss of habitats, the proposed landscape plans include the planting of native treelines and also woody hedgerow species to fill in gaps in existing hedgerows/treelines in the northern buffer area of the site, the construction of a new pond wetland habitat in the north-eastern corner of the site with wetland planting (c.1.7ha) and the planting of wildflower hay meadows, also in the northern buffer area of the site. The planted hedgerow species will mainly consist of *Corylus avellana, Crataegus monogyna* and *Prunus avium,* whilst the treelines will mainly consist of *Alnus glutinosa, Betula pendula, Pinus sylvestris* and *Quercus petraea.* The pond will be planted with *Phragmites australis, Sparganium erectum* and *Typha latifolia*, amongst other species. Any remaining hedgerows will be preserved, retained and protected in accordance with the arborist's report and where feasible. Landscaping will also include extensive areas of wildflower hay meadow throughout the Proposed Development. This will be supplemented by the green walls and new hedgerow that will centrally link the eastern and western boundaries of the site

Birds

6.202 The Proposed Development will result in foraging and breeding habitat loss of various bird species. The landscape planting includes planting of treeline, hedgerow, pond wetland and wildflower hay meadow grassland habitats, which will mitigate the loss of pre-existing habitats for breeding and wintering bird species. In addition, landscaping will also include extensive areas of wildflower hay meadow throughout the Proposed Development, which will especially benefit granivorous (e.g. finches) and wintering bird species (*i.e.* snipe).