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

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Peamount Substation and transmission lines
Milltown

March 2021

MARSTON
PLANNING CONSULTANCY

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1. INTRODUCTION

1.1 This Environmental Impact Assessment (EIA) Report has been prepared on behalf of Data and Power Hub Services (herein referred to as the 'applicant') to accompany a Strategic Infrastructure Development planning application to An Bord Pleanála (ABP). Planning permission is being sought for the provision of an 110kV Gas Insulated Switchgear (GIS) Substation (known as Peamount Substation), 3 no. transformer bays, Client Control Building, and all associated and ancillary development to be located on lands at Grange Castle South Business Park, Baldonnel, Dublin 22.

1.2 Planning permission is also being sought for two underground single circuit 110kV transmission line from the proposed 110kV GIS Substation compound to the Castlebaggot – Kilmahud Circuit c. 940m to the east. These works are described in detail within Chapter 2 (Description of the Proposed Development) of this EIAR.

1.3 This development will hereafter be referred to as the 'Proposed Development'. EirGrid will be the transmission system operator (TSO). ESB Networks will be the transmission asset owner (TAO). (The company background and roles of the TSO and TAO are summarised in paragraph 1.22-1.24).

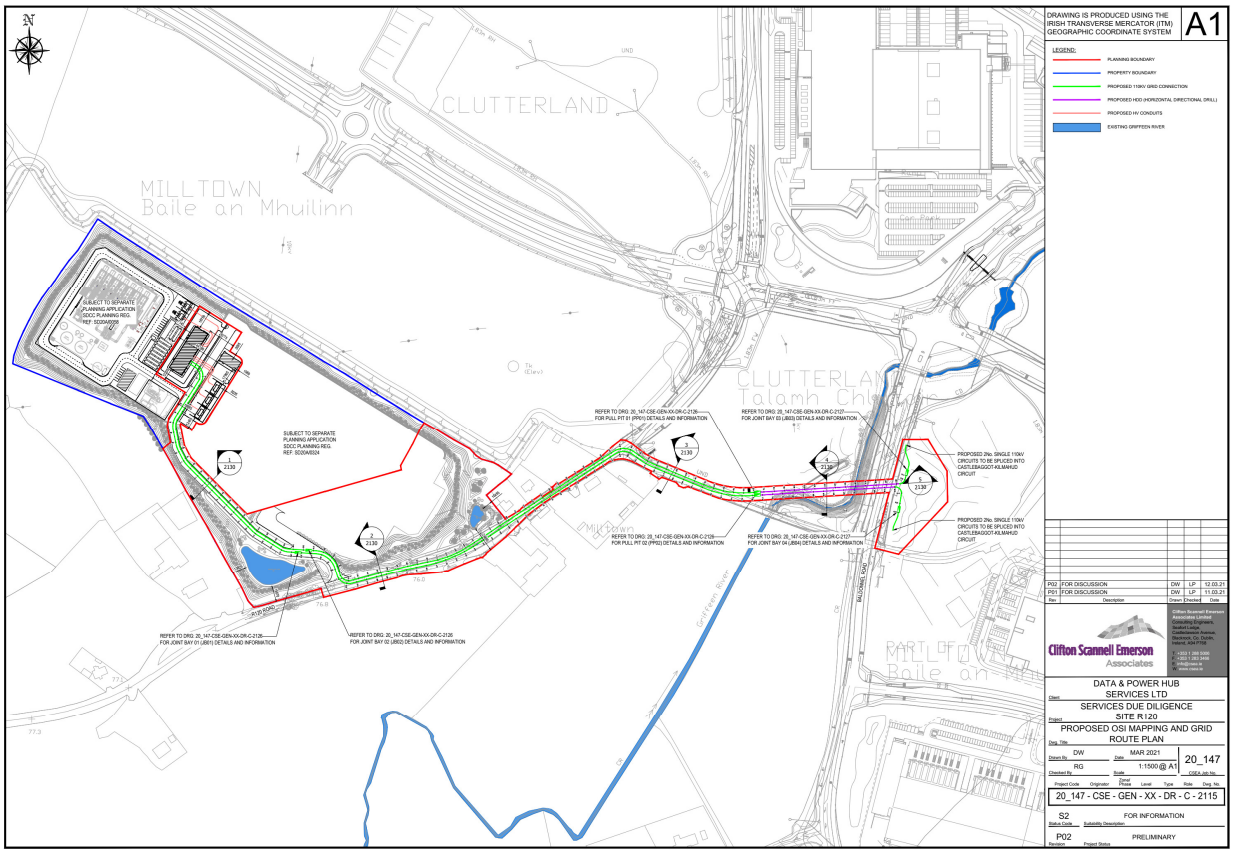

Figure 1.1 *Site Boundaries* - Proposed Development site boundary (red line), Permitted Development boundary, the proposed 110kV transmission lines (green and light pink lines) (Source: Clifton Scannell Emerson Associates, July 2020)

1.4 Figure 1.1 presents the route of the proposed underground 110kV transmission lines and the proposed GIS substation compound. A detailed description of the Proposed Development, and further drawings of the Proposed Development are provided in Chapter 2 (Description of the Proposed Development).

1.5 The Proposed Development was assessed cumulatively (as a potential future development that would be subject to a separate planning application and separate Environmental Impact Assessment) as part of the Environmental Impact Assessment (EIA) undertaken in respect of the application under South Dublin County Council Reg. Ref. SD20A/0324. This application is currently subject to an Additional Information request from the Planning Authority issued on the 11th February 2021. An application for a Power Generation Facility on the northern part of the site, received its Final Grant of permission from the Planning Authority on the 17th December 2020 under SDCC Reg. Ref. SD20A/0058. Whilst this application was not accompanied by an EIA Report, it has been cumulatively assessed under both this and the ICT facility application. The Proposed Development will be located primarily within the overall

site of the permitted Power Generation Facility development and which is subject to the concurrent data centre application.

1.6 The Proposed Development is to be located on a site of c. 4.6hectares that consists of a primarily greenfield site of that sits to the north of the Peamount Road (R120). The Proposed Development site includes a site of 1.6 hectares that forms the plots and associated lands of two residential properties known as Little Acre, Bulmer, and associate agricultural buildings within the townland of Milltown, Newcastle, Co. Dublin; as well as extending along the R120, former R134 (old Nangor Road), and across land to the east side of the Baldonnel Road within the townlands of Milltown and Clutterland.

1.7 The lands to the immediate north of the proposed substation site are owned by South Dublin County Council and are being promoted as a further expansion of the Grange Castle Business Park to be known as Grange Castle West to attract overseas investment to the area. Located to the west of Clondalkin, Grange Castle has been the focus of significant international investment over the last several years.

1.8 The Proposed Development site is approximately 6km 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.

Legislative Requirements

1.9 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 2001-2017. 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.

1.10 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.

1.11 The project proposed is not listed under Annex I EIA Directives. However, it exceeds the relevant threshold as set out in the Planning and Development Regulations 2001-2019 for Annex II projects. The threshold for "*industrial estate development projects, where the area would exceed 15 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 in the subject location. An EIA Report has been provided as the Proposed Development is required to enable export of power from the permitted Power Generation Facility, as well as import of power to serve it. The Proposed Development is also designed to provide power to the concurrent application for an ICT facility on the site. This may require a separate connection in terms of transmission lines to the National Grid and a separate application to the Board.

1.12 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 to date 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 EIA Report

1.13 This EIA Report has been prepared in accordance with the requirements of EIA Directives (2011/92/EU and 2014/52/EU). 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).

1.14 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.

1.15 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); and
- *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements* Draft September 2015 (Environmental Protection Agency).

1.16 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.

1.17 A Non-Technical Summary of the findings of the EIA Report is provided as a separate document.

1.18 A Schedule of Mitigation measures to be implemented as part of the Proposed Development is included in Appendix 2.3.

1.19 Cumulative impacts for each environmental topic are assessed within each Chapter of this EIA Report.

1.20 Interactions i.e. the interrelationship between each environmental aspect, are assessed as they occur in each chapter. The final chapter of the EIA Report, Chapter 17 shows where interactions have been identified and how they have been addressed.

Need for the Proposed Development

1.21 The Proposed Development is designed to enable the export of power from the Power Generation Facility (PGF) to the National Grid. This connection has been granted and accepted by Eirgrid. The proposed substation is also designed to provide a permanent power supply for the ICT facilities, if granted, that is subject to the concurrent application, and a request for Additional Information, under SDCC Reg. Ref. SD20A/0324. The same infrastructure, or part thereof, will be used to provide power to the ICT facilities.

Company background

1.22 The Applicant seeks to provide data storage, management and dissemination services. To date, the Applicant has sought and gained permission for a number of ICT facilities in Ireland. 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.

1.23 Eirgrid is the transmission system operator (TSO). Since 2006, Eirgrid has operated and developed the national high voltage electricity grid in Ireland. EirGrid is a state-owned company. EirGrid is independent from ESB. They operate the flow of power on the grid and plan for its future, while ESB Networks (the TAO) is responsible for carrying out maintenance, repairs and construction on the grid. The grid moves wholesale power around the country. Eirgrid brings energy from generation stations

to heavy industry and high-tech users. They also supply the distribution network operated by ESB Networks that powers every electricity customer in the country.

1.24 ESB Networks are the transmission asset owner (TAO). ESB Networks is a subsidiary within ESB Group. ESB Networks finances, builds, and maintains the transmission system through which electricity flows from generation stations to bulk supply points near Ireland's cities and towns. It does this under a TAO licence granted by the Commission for Regulation of Utilities (CRU). ESB Networks performs its transmission related functions under the direction of Eirgrid. In summary EirGrid operates the transmission system (TSO) while ESB Networks carries out construction, maintenance, and repairs (TAO) under the direction of EirGrid. For this development, EirGrid will operate the proposed new GIS substation, remotely from their control centres. However, ESB Networks will carry out all local operations on Eirgrid's behalf. Eirgird and ESB Networks are committed to running their businesses in the most environmentally friendly way possible.

Consultation

1.25 The Applicant and the project team have liaised with An Bord Pleanala (ABP) in advance of lodgement of the application for the Proposed Development on the 13th November 2020. Previously consultation meetings were held with South Dublin County Council as part of the application for the PGF and ICT facility applications in which the Proposed Development was presented as part of future infrastructure development, on the 26th September 2019 and 8th September 2020.

1.26 The EIA contributors/authors have incorporated advice and comments received from South Dublin County Council and ABP into the relevant chapters of this EIA Report.

Regulatory control

1.27 The proposed transmission of electricity is not an EPA regulated activity in terms of the Industrial Emissions Directive (Directive 2010/75/EU) (which replaced the IPPC directive). The TSO and TAO will ensure the relevant regulatory requirements relating to power activities are met.

Description of effects

1.28 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 env..
	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

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

Appropriate Assessment Screening Report

1.30 A screening report has been completed by Scott Cawley, Consulting Ecologists 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. The AA (Appropriate Assessment) screening report document forms part of the SID application. The AA screening process has identified that four European sites lie within 15km of the Proposed Development; with another four hydrologically connected to the Proposed Development site via the River Liffey.

1.31 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 AA Screening Report that there is no potential for likely significant effects on any European sites.

Flood Risk Assessment

1.32 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

1.33 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

1.34 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
Engineering Design		Clifton Scannell Emerson Associates (CSEA)
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 – Caroline Kelly
Chapter 7	Land, Soil, Geology and Hydrogeology	AWN Consulting – Colm Driver
Chapter 8	Hydrology	AWN Consulting - Colm Driver
Chapter 9	Noise and Vibration	AWN Consulting – Mike Simms
Chapter 10	Air Quality and Climate	AWN Consulting – Ciara Nolan
Chapter 11	Landscape and Visual Impact	Kevin Fitzpatrick, Landscape Architecture – Kevin Fitzpatrick
Chapter 12	Traffic and transportation	Martin Peters, Consulting Engineers – John Ahearne
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 – *Caroline Kelly.* Caroline is a Senior Ecologist with Scott Cawley. Caroline holds an honours degree in Environmental Biology, from University College Dublin and a Masters in Applied Ecological Assessment from University College Cork. Caroline has over 5 years professional experience and is skilled in habitat survey and assessment (including Annex I habitats and legally protected sites) in a range of terrestrial, freshwater and coastal environments, surveys for protected species (e.g. bats, badger, otter), bird surveys (both breeding and overwintering), and surveys for invasive species. Additional experience includes monitoring badger sett closures, manual bat call analysis and the use of GIS software. Whilst working at Scott Cawley, Caroline has managed ecological assessments for a wide range of projects including tourism, recreational, industrial, commercial, residential, transport and renewable energy developments.

Land, Soils, Geology, Hydrogeology, and Hydrology- *Colm Driver*. Colm is an Environmental Consultant (Hydrogeologist) with AWN Consulting with over 4 years' experience in the field of environmental sciences including hydrogeology, soils, geology, geotechnical engineering, and impact assessment. His role at AWN includes responsibility for groundwater related projects including

groundwater resource management and assessment, aquifer characterisation and source protection plans, contaminated land assessments, groundwater modelling, hydrogeology and geology in EIAR. His experience also includes the provision of hydrogeological conceptual site models (CSM) and ArcGIS mapping.

Noise and Vibration - *Mike Simms*. Mike is a Senior Acoustic Consultant with AWN and holds a BE and MEngSc in Mechanical Engineering, and is a member of the Institute of Acoustics (MIOA) and of the Institution of Engineering and Technology (MIET). Mike has worked in the field of acoustics for over 19 years. He has extensive experience in all aspects of environmental surveying, noise modelling and impact assessment for various sectors including, wind energy, industrial, commercial, and residential.

Air Quality & Climate - *Ciara Nolan.* Ciara is an Environmental Consultant with AWN specialising in the field of Air Quality. She holds a BSc (Hons) in Energy Systems Engineering from University College Dublin and has also completed an MSc in Applied Environmental Science at UCD. She is an Associate Member of the Institute of Air Quality Management. She specialises in the fields of air monitoring, air dispersion modelling and EIA. She has been active in the field of air quality for 4 years with a primary focus on consultancy.

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 – *John Ahearne.* John is a Transportation Engineer with a degree in Civil and Environmental Engineering with several years of experience 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

Introduction

2.1 As described in Chapter 1 (Introduction), the Applicant is applying to ABP for planning permission for the provision of a new 110kV Gas Insulated Switchgear (GIS) Substation (known as Peamount), 3 no. transformer bays, Client Control Building, associated compounds and site infrastructure to be located on lands at Milltown, Newcastle, Co. Dublin. The application also includes 2 no. underground single circuit 110kV transmission lines from the proposed Peamount Substation connecting to the existing 110kV Castlebaggot / Kilmahud circuit c. 940m to the east and all associated and ancillary works (hereafter referred to as the 'Proposed Development').

2.2 This chapter presents a description of the Proposed Development as required by the relevant planning legislation, Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, as amended by the 2014 EIA Directive (2014/52/EU) (herein referred to as the EIA Directive), European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, the Draft EPA "*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*" (2017) and the Draft EPA "Advice Notes for Preparing Environmental Impact Statements" (2015) (herein referred to as the Draft EPA Advice Notes for EIS 2015). Guidance outlined in the 'Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report'' published by the European Commission in 2017 was also considered in the preparation of this EIA Report.

Characteristics of the site

2.3 The Proposed Development is to be located on a site of c. 4.6ha. that consists of two parts. Firstly, within a primarily greenfield site that sits to the north of the Peamount Road (R120) and a site of 1.6 hectares that forms the plots and associated lands of two residential properties known as Little Acre and Bulmer, as well as associated agricultural buildings within the townland of Milltown, Newcastle, Co. Dublin. The second part of the site consists of a linear route that consists of part of the R120, former R134 (Nangor Road), greenfield land and Baldonnel Road. The substation site and its overall site is bounded by the Peamount Road (R120) to the south; a haulage business and further agricultural lands to the west; further agricultural lands to the north; and further agricultural lands and two residential properties that abound the R120 to the east.

2.4 The proposed 110kV GIS Substation Compound; and part of the transmission line within the wider substation site to the existing 110kV underground Castlebaggot - Kilmahud circuit are located on lands that at the time of making this application are in private ownership.

2.5 The transmission line outside of the wider substation site to the existing 110kV Castlebaggot - Kilmahud circuit to the east is located on lands that include the R120, former R134 (Nangor Road), greenfield land and Baldonnel Road that are in the control or ownership of SDCC. Letters of consent are included within the planning application documentation for the Proposed Development.

Proposed 110kV GIS Substation

2.6 The proposed 110kV GIS substation is located on lands that are bounded by the permitted Power Generation Facility (PGF) to the north-west; agricultural lands to the south-west; lands in the ownership of SDCC as part of Grange Castle West to the north-east; and the proposed ICT facility subject to the concurrent application under SDCC Reg. Ref. SD20A/0324 to the south-east.

110kV transmission line to the Castlebaggot - Kilmahud Circuit

2.7 The route of the underground 110kV transmission line to the Castlebaggot - Kilmahud circuit passes along the permitted internal access road to the PGF granted under SDCC Reg. Ref. SD20A/0058 within the Milltown part of the site before passing under the R120 (Peamount Road) for c. 300m to the north-east to its junction with the former Nangor Road (R134) (now cut off at either end) where it will pass under c. 100m of its length before diverting across SDCC owned land before passing under the culverted Griffeen River (150m) and under the realigned Baldonnel Road to connect to the

Castlebaggot-Kilmahud circuit. The length of the 110kV cable route is c. 940m. A proposed joint bay is to be installed at the connection to the Castlebaggot-Kilmahud circuit as well as along this route.

2.8 The Proposed Development is not located directly adjacent to any areas of national or local environmental sensitivity/designation (Refer to Chapter 6 - Biodiversity for further details). The need for the Proposed Development is described on page 3 of Chapter 1 of the EIA Report.

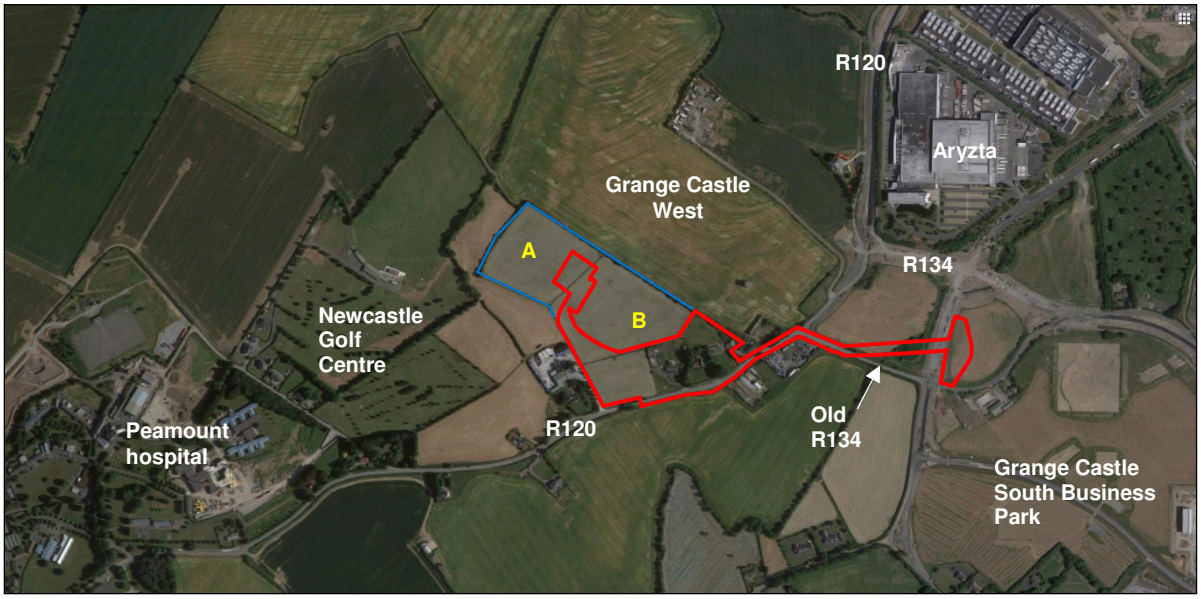

Figure 2.1 Proposed Development site outlined in red with the wider PGF and part of ICT site outlined in blue in context of surrounding development and land uses (Source: Google Earth)

Permitted development

2.9 The lands to the north-west of the proposed substation received a Final Grant of permission for a Power Generation Facility on the 17th December 2020. The permission was subject to 19 conditions. A full description of the permitted development is outlined in Chapter 3 of this EIAR.

Concurrent application on the site

2.10 An application for an Information Communication Technology (ICT) facility was made to the Planning Authority on the 9th December 2020 on lands to the south-east of the proposed substation (see "B" in Figure 2.1). A request for Additional Information was issued by the Planning Authority on the 11th February 2021. A portion of the lands that are subject to the Proposed Development under the current application (indicated by the red line in Figure 2.1) are within the property boundary of the Permitted Development and concurrent application. A full description of the concurrent application is outlined in Chapter 3 of this EIAR. As the concurrent application is undetermined, the additional landscaping proposed under the ICT application to the front of the site, that includes a bat mitigation strategy, for the demolition of houses and other structures, is included within the Proposed Development that is subject of this EIA Report.

Proposed Development description

2.11 The Proposed Development will consist of:

- The proposed development primarily comprises the demolition of the existing two storey dwelling of Bulmer and associated outbuildings and stable building; and the provision of two no. 110kV transmission lines and a 110kV Gas Insulated Switchgear (GIS) substation compound and Transformers / MV switch room compound along with associated and ancillary works. The site of the proposed development has an area of c. 4.6 hectares, and the proposed development is described as follows:

- The proposed 110kV GIS Substation and Transformers / MV control room compounds are to be located on lands to the south-east of the Power Generation Facility that was permitted under SDCC

Reg. Ref. SD20A/0058 and to the north-west of the concurrent application for 2 no. two storey Information Communication Technology (ICT) facilities each with three storey plant levels and associated ancillary development that will have a gross floor area of 30,518sqm under SDCC Reg. Ref. SD20A/0324, and within an overall landholding bound to the south by the Peamount Road (R120); and on lands that contain the 2 no. residential properties of Little Acre and Bulmer as well as agricultural lands and buildings within the townland of Milltown, Newcastle, Co. Dublin.

- The proposed demolition of the existing two storey dwelling of Bulmer and associated outbuildings and stable building to the front of the site. The existing Little Acre dwelling and associated buildings are permitted to be demolished under SDCC Reg. Ref. SD20A/0058.

- The proposed 110kV Gas Insulated Switchgear (GIS) Substation Compound includes the provision of a two storey GIS Substation building (with a gross floor area of 1,430sqm) (known as the Peamount Substation), car parking, lighting, associated underground services and roads within a 3.0m high fenced compound, and all associated construction and ancillary works. The Transformers / MV switch room compound includes three transformers plus MV control room (200sqm), lighting and lightning masts, car parking, associated underground services and roads within a 3.0m high fenced and separate compound, and all associated construction and ancillary works.

- Two proposed underground single circuit 110kV transmission lines will connect the proposed Peamount 110kV GIS Substation to the existing Castlebaggot-Kilmahud circuit to the east. The proposed transmission lines cover a distance of approximately 940m within the townlands of Milltown and Clutterland. They will pass outside of the site and along and under the following: R120, the former Nangor Road, Griffeen River and the newly realigned Baldonnel Road.

- The development includes the connections to the proposed Peamount substation as well as to the Castlebaggot-Kilmahud circuit, as well as changes to the attenuation pond and landscaping permitted under SDCC Reg. Ref. SD20A/0058 and all associated construction and ancillary works.

2.12 Figure 2.2 presents a site layout plan showing the route of the proposed 2 no. underground 110kV transmission lines, and the proposed 110kV GIS substation.

110kV GIS Substation Compound

2.13 The proposed 110kV Gas Insulated Switchgear (GIS) Substation Compound is to be located on lands which are currently greenfield in nature, to the south-east of the Permitted Development granted under SDCC Reg. Ref. SD20A/0058 and within an overall landholding bound to the south by the Peamount Road; by agricultural lands and a haulage company to the west; further agricultural lands to the north; and the proposed Grange Castle West Business Park to the east within Milltown, Co. Dublin.

2.14 The proposed 110kV GIS Substation is provided within two compounds. The GIS compound includes the provision of a two storey GIS Substation building (with a gross floor area of 1,430sqm) (to be known as the Peamount Substation) within a 3.0m high fenced compound and all associated construction and ancillary works. The two storey GIS substation building (with a gross floor area of 1,430sqm) will accommodate a cable pit, generator room, workshop, mess room, hoist area, relay room, mess room, generator room and battery room at ground floor level, with a storeroom and substation room at first floor level. The GIS Substation, which is rectangular in shape, is located to the north of the permitted internal access road that will serve it and will be served by 5 no. car parking spaces; and will be located adjacent to the PGF. The access gateway to the compound will be provided on the southern side of the substation compound, providing for vehicular and pedestrian access to the substation area.

2.15 The transformer compound is located to the south of the internal access road and will consist of three transformers, an MV Control Building that is rectangular in form (with a gross floor area of 200sqm), Lighting Masts, and 6 no. car parking spaces. The single storey MV Control Building will accommodate 2 number electrical switch rooms, AUX transition room, relay room, battery room and a control room. The proposed transformers will be located to the west of the MV Control Room, and set out in a row running north-east to south-west parallel to the access road within their compound area. Both the GIS Substation and MV Control Building are finished in metal cladding and are to be accessed off the internal access road proposed to serve the ICT facility. This element of the proposed development is

entirely related to the ICT facility and therefore there is no issue of prematurity given that permission has not yet been granted under SDCC Reg. Ref. SD20A/0324.

110kV transmission lines

2.16 The design of each underground 110kV transmission line will comprise a single 110kV circuit installed underground in high-density polyethylene (HDPE) ducting. The 110kV cables will be a standard XLPE (cross-linked polyethylene) copper cable. XLPE does not contain oil, therefore there is no risk of migration of oil into the ground in the event of a failure (such as a short circuit, a joint fail, a termination failure etc.). These types of failures would not have the potential to result in a perceptible environmental impact.

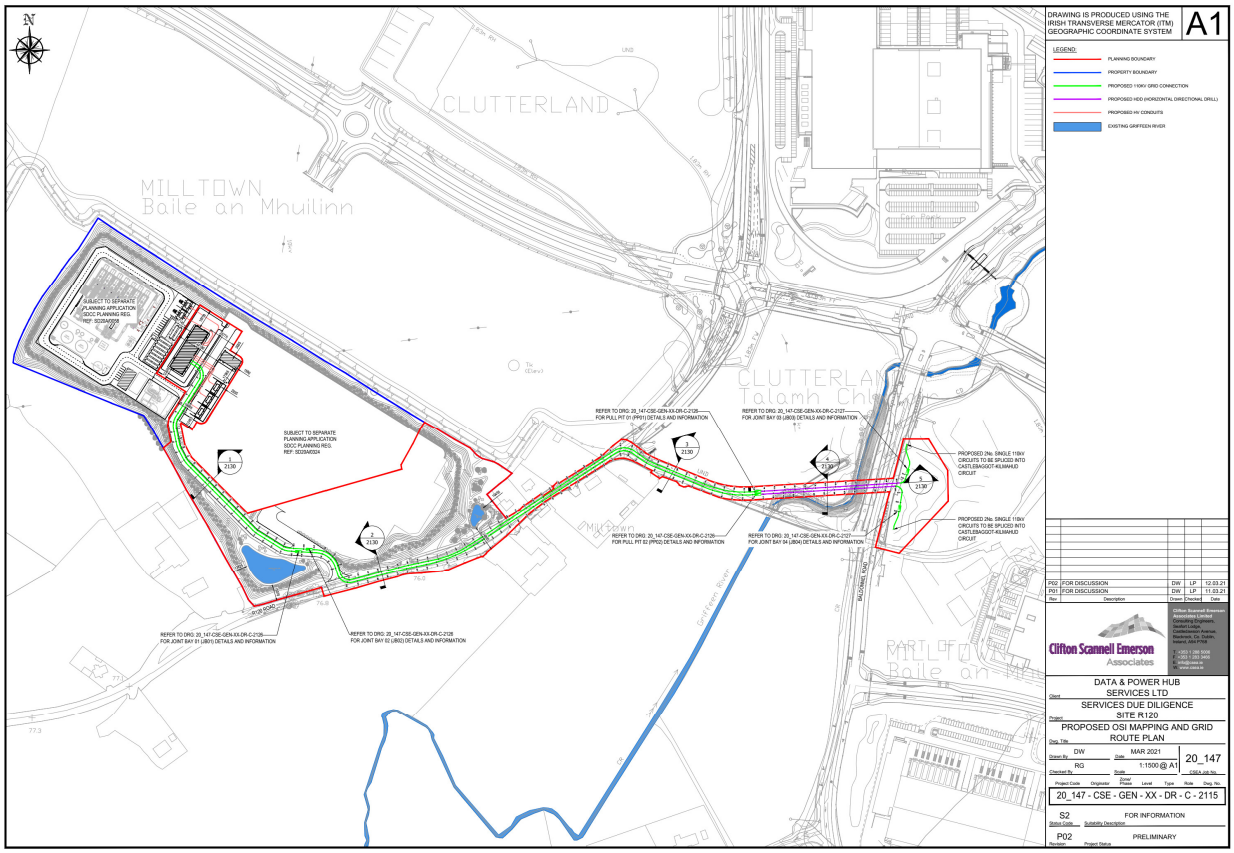

Figure 2.2 Proposed site layout plan of the Proposed Development site *(red line) indicating proposed 110kV transmission lines (green and pink line) well as the permitted development (Source: Drawing no. 20_147-CSE-GEN-00-XX-DR-C-2115, CSEA Consulting Engineers)*

2.17 The installation of the HDPE ducting will require the excavation of one trench along each of the routes; each containing one 110kV circuit. The optimum depth of excavation of the trenches will typically be 1.25m below ground level but may increase at utility crossings. The typical width of each trench is 0.6m, however this may vary depending on ground conditions and the location of existing services. Five separate ducts will be installed in each trench. For the purposes of this assessment, reference to the 'transmission lines' refers to the transmission line to the Castlebaggot - Kilmahud circuit. A typical cross section of the trench is illustrated in Figure 2.3.

2.18 Horizontal directional drilling is proposed for a c. 150m length of the 110kV transmission line from the Castlebaggot-Kilmahud circuit. The location of the directional drilling is under the culverted Griffeen River where the 110kV transmission line from the Castlebaggot-Kilmahud circuit crosses under the new Baldonnel Road to the former Nangor Road. The depth of the drilling is expected to be c. 9.65m in depth and will require four separate directional drillings that will be c. 2.5m apart.

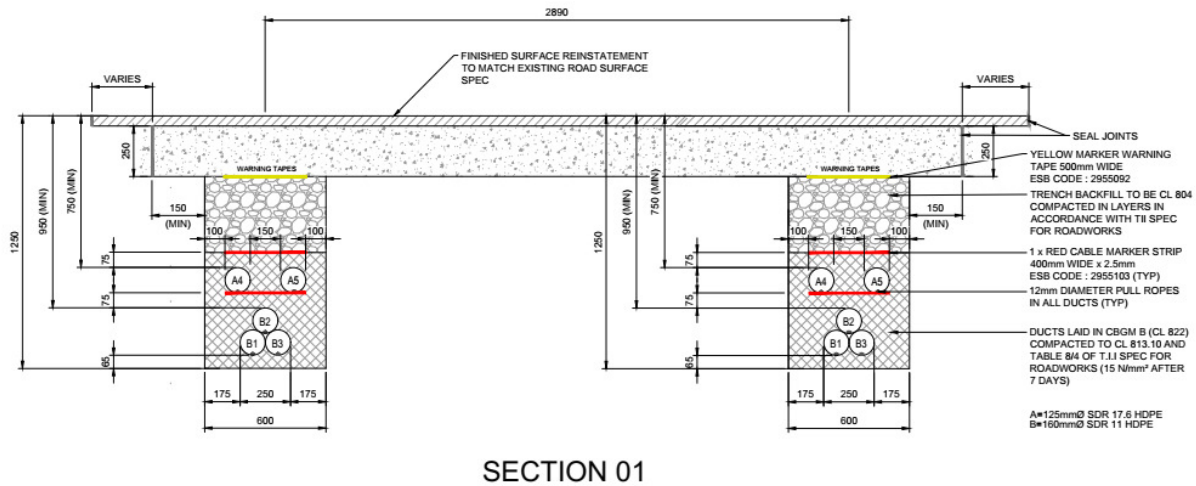

Figure 2.3 Typical cross-section of HV transmission line trench from the Castlebaggot - Kilmahud Circuit to the proposed Peamount substation within main site (*Source: Drawing no. 20_147-CSE-GEN-00-XX-DR-C-2130, CSEA Consulting Engineers)*

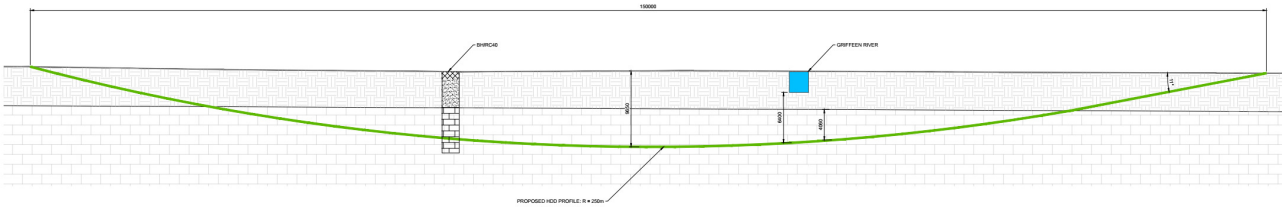

Figure 2.5 Typical cross-section of HDD profile under the Griffeen River (*Source: Drawing no. 20_147-CSE-GEN-00-XX-DR-C-2130, CSEA Consulting Engineers)*

Proposed Site Infrastructure and Secondary Facilities

Surface Water Drainage (Refer to Chapter 8 – Hydrology for further details)

2.19 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 2 no. attenuation areas that have been enlarged from permitted under SDCC Reg. Ref. SD20A/0058 with the largest having a capacity of 2,903m^3 to be located at the south-western and the smaller pond having a capacity of 325m^3 at the south-eastern part of the site, and allows for the master planning development of the entire site. The storm water system has been modelled to ensure no physical clashes with other utilities, notably the proposed foul system.

2.20 The drainage design requirements state that any development must restrict post development run-off rates to the pre-development, greenfield rates. This requires any new development to restrict storm water flows leaving the site to pre-developed rates. In practice, to accommodate this requirement, onsite storage must be provided to temporarily store rainwater generated on site. The 2 no. attenuation areas (increased in size under this application) 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.

2.21 The ponds have 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 south and outfall into an existing storm sewer to the east of the main site.

2.22 A hydrocarbon interceptor will be provided for the proposed development as shown on drawing no. 19229-JBB-00-XX-DR-C-01500. The storm water run-off from the Development will pass through a minimum of 3 SuDS Devices. The storm water system will be in accordance with “The Regional Code

of Practice for Drainage Works and South Dublin County Council requirements. Storm water will pass through a new network into an existing storm sewer and will discharge via the local sewer network to the Local Authority wastewater treatment plant (WWTP) at Ringsend.

2.23 Full details on surface water drainage design are provided within the *Water Services Report*, prepared by JB Barry Consulting Engineers which accompanies the planning submission for the Proposed Development. Chapter 8 Hydrology and Chapter 15 Material Assets address the potential impacts of the Proposed Development on storm water drainage.

2.24 The underground 110kV transmission lines from the proposed substation to the Castlebaggot-Kilmahud Circuit and new joint bays do not require any surface water drainage infrastructure.

Foul Drainage

2.29 Domestic effluent arising from the welfare facilities at the Proposed Development's GIS substation will be collected in a foul drain within the site and discharge to the existing foul drainage network via a new 225mm pipe network that will be installed under the Peamount Road and former Nangor Road to connect into the existing system 375mm public sewer at Baldonnel Road, some 550m away from the boundary of the main site, which ultimately discharges to the municipal Waste Water Treatment Plant (WWTP) at Ringsend. The wastewater contribution from the Proposed Development will be minimal.

2.30 The proposed layout of the Permitted Development under Reg. Ref. SD20A/0058 and the concurrent application under SDCC Reg. Ref. SD20A/0324 require that a number of connections to the existing foul infrastructure are undertaken (refer to JB Barry Consulting Drawings for details of same). The Permitted Development's 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.

2.31 The underground 110kV transmission lines from the proposed substation to the existing Castlebaggot - Kilmahud Circuit and new joint bays do not require any foul drainage infrastructure.

2.32 A pre-connection enquiry (PCE) form was submitted to Irish Water (IW) as part of the Permitted Development application (Reg. Ref. SD20A/0058) that took into account the proposed substation and transformers / MV Control Room. IW provided a confirmation of feasibility (CoF) for the development on the 14th April 2020 (IW Reference Number: Reference No CDS20001484).

2.33 Further detail in relation to wastewater emissions is presented in the JB Barry Water Services Report, which accompanies this planning application and in Chapter 8 Hydrology and Chapter 15 Material Assets of this EIA Report. There are no process wastewater emissions to the foul drainage system.

Water Supply

2.34 Water will be required for the welfare facilities at the GIS substation. It is proposed that this will be provided via a connection from the existing 4'' AC watermain in the public road directly outside the site as shown on drawing 19229-JBB-00-XX-DR-C-01502. A new metered 150mm diameter supply will be installed to provide potable water for domestic purposes and to supply the production process. Details are shown on Drawing No. 19229-JBB-00-XX-DR-C-01502 which accompanies the planning application.

2.35 The daily domestic water demand for the proposed development is based on Appendix D of the Irish Water Code of Practice for Wastewater Infrastructure (July 2020 - Rev 2). The number of staff in the GIS Substation and Transformers / MV switch Room is estimated to be 5 persons per day. This is likely to be an over-estimation of the daily staff required. Chapter 8 Hydrology and Chapter 15 Material Assets address the impacts on water supply. The average daily water demand is estimated at being 0.02 l/sec; with the peak demand being 0.15 l/sec.

2.36 The underground 110kV transmission lines from the proposed substation to the existing Castlebaggot – Kilmahud Circuit and new joint bays do not require any water supply.

2.37 A pre-connection enquiry (PCE) form was submitted to Irish Water (IW) as part of the Permitted Development application (Reg. Ref. SD20A/0058) that took into account the subject of the current

Proposed Development. IW provided a confirmation of feasibility (CoF) for the development on the 14th April 2020 (IW Reference Number: Reference No CDS20001484).

Electricity

2.38 The proposed 110kV GIS substation and 110kV transmission lines are designed to enable the export of power from the permitted PGF as granted under SDCC Reg. Ref. SD20A/0058. A Connection Offer has been provided by Eirgrid for the export of power from the permitted PGF to the Castlebaggot-Kilmahud Circuit. The PGF is located to the north-west of the proposed 110kV GIS (Peamount) substation.

2.39 The proposed 110kV GIS substation and 110kV transmission lines are also designed to support the power demand for the concurrent application for an ICT facility under SDCC Reg. Ref. SD20A/0324. This may require a separate connection in terms of transmission lines to the National Grid and a separate application to the Board. This concurrent application was subject to a separate planning application and EIA Report and is located to the south-east of the proposed 110kV GIS (Peamount) substation. A full description of both applications is set out under Chapter 3 of this EIA Report.

Telecommunications

2.40 A fibre optic cable distribution network will be installed to serve the permitted and concurrent applications. The fibre network for these developments will be extended to the GIS substation.

Fire water system

2.41 A fire water ring main will be installed for the Permitted Development and will extended to the Proposed Development to provide firefighting water to hydrants in the event of a fire.

Security and lighting

2.42 Other than during construction, the traffic accessing the GIS substation will approach and access the site through the permitted new entrance road to be constructed off the Peamount Road as granted permission under the PGF permission under SDCC Reg. Ref. SD20A/0058. A maximum speed limit of 20km/hour will be in place on the access road.

2.43 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, and if required suitable and appropriate procedures to deal with Covid-19 will be implemented.

2.44 A 3m high security fence will be constructed around the perimeter of the proposed GIS substation and transformer compounds. The proposed substation compound fence will be located 2m inside the base of the proposed berms that will bound the Permitted Development site to the north-east. The proposed GIS substation will be partly screened from the R120 to the north-east and from Peamount to the west; and fully screened from the south by berms and planting. The intention is that boundary berms and planting will be significant as set out under the Permitted Development landscape plan and concurrent application (refer to Chapter 11 Landscape and Visual Impact). The berms and planting proposed under the concurrent application along Peamount Road, but not under the permitted development, have been included and form of the current application.

2.45 CCTV cameras will be installed at strategic locations around the site to ensure all boundaries and approaches to the site are adequately monitored. 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.

2.46 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

2.47 The Permitted Development and concurrent application have been modelled, to ensure that it achieves the twin aims of having safe circulation routes whilst not having a long term impact on foraging, commuting and bat roosts. The lighting design will ensure 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.

Site roads and parking

2.48 The main construction and operational access to the Proposed and Permitted Developments will be from the permitted new access point into the site off the Peamount Road. Other than during construction, the traffic accessing the Proposed Development's GIS substation will approach and access the site through the permitted new internal access road to be constructed off the Peamount Road that was granted under SDCC Reg. Ref. SD20A/0058. This new entrance will be constructed as part of the Permitted Development. A maximum speed limit of 20km/hour will be in place on the internal access roads. Access arrangements and potential traffic safety impacts are considered in Chapter 12 Traffic and Transportation. Car parking for 5 cars will be provided adjacent to the proposed 110kV GIS substation. This is to allow for parking for full time staff as well as external staff, maintenance contractors and visitors attending the Proposed Development.

Existence of the Project

2.49 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 Proposed Development under the following headings:

- Construction;
- Commissioning;
- Operation;
- Decommissioning; and
- Description of other related projects.

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

Description of Construction

2.51 The construction of the proposed 110kV GIS substation will comprise four main stages, namely:

- Site preparation works;
- Building Structure Construction;
- Building Envelop Construction; and
- Fit Out including mechanical and electrical fit-outs and commissioning.

2.52 The construction of the 110kV transmission lines will comprise three main stages, namely:

- Site preparation works and excavations;
- Cable installation, jointing and testing; and

- Reinstatement.

2.53 The construction of the new joint bays will be undertaken as part of the 110kV transmission line works to the Castlebaggot - Kilmahud circuit will comprise three main stages, namely:

- Site preparation works and excavations;
- Construction of concrete bases for the electrical apparatus; and
- Fit Out Including M&E and commissioning.

Working Hours

2.54 It is anticipated that the construction of the GIS substation, the 110kV transmission lines with their joint bays will be completed during normal construction hours i.e. 7am to 7pm Monday to Friday with a half day working on Saturday (9am-1pm). Covid-19 restrictions may result in a prolonged construction schedule.

2.55 A portion of the 110kV transmission lines to the Castlebaggot - Kilmahud Circuit is in the public domain. Construction of this portion of the route will be carried out between the hours of 10am and 4pm. During construction, staff will arrive on site at approximately 8am and take c. 1.5 to 2 hours to mobilise before commencing works. The works along and under the Peamount Road, and across and under the Baldonnel Road will be carried out along short lengths to minimise disruption. These works are likely to require closure of lanes for 1-2 weeks in both instances as works are undertaken. The works will be managed on a stop/go controlled basis for the length of these works.

2.56 The remainder of the routes will be completed during normal construction hours i.e. 7am to 7pm Monday to Friday with a half day working on Saturday (9am-1pm). However, it is possible that the appointed contractors may wish to carry out certain operations 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 are unlikely to cause excessive disturbance.

Staffing

2.57 The following construction data has been used to estimate peak daily construction traffic (assumed to occur during civil works period for substation building):

- Average construction staff: 15-20; and
- Peak construction staff (peak staff levels during civil works): 30.

Construction schedule

- Application for Planning Permission – Q1 2021;
- Commence Site Construction works (subject to grant of planning permission) – Q4 2021; and
- Completion of Construction and Commissioning – Q3 2023.

Site preparation

2.58 Construction of the Proposed Development is due to commence, subject to grant of planning permission, in Q4 2021. Works in relation to the Permitted Development and the concurrent application, if permitted, have the potential to occur at the same time and overlap with the Proposed Development. It is proposed that the accesses and haul roads for vehicles, the contractors' compound and fencing will be utilised for all development on the main site.

2.59 The construction compound, which will be the same that will be established for the Permitted Development and the concurrent application, if permitted, will facilitate office, portable sanitary facilities, equipment storage, parking etc. for contractors. It will be used for the duration of the works.

2.60 The site preparation phase for the GIS substation will involve site clearance, excavations and levelling of the site to the necessary base level for construction, surveying and setting out for structures and

any rerouting of services/connections to services. A combination of bulldozer, excavators, trucks and other soil shifting plant will commence the main site clearance and levelling aspects.

2.61 The site preparation required for the 110kV transmission lines and the new joint bays will require minimal site clearance. A combination of excavators, trucks and other soil shifting plant will commence the transmission line clearance and levelling aspects.

Building Construction Works

Foundations and Structure

2.62 Following the completion of site clearance and levelling, all structures will require foundations to structural engineer specifications. Building structures will comprise standard structural steel frames. It is anticipated that foundations will require moderate scale excavations. Minor dewatering may be required during excavation works and groundworks (depending on the time of year development works are carried out; refer to Chapter 8 - Hydrology of this EIA Report).

Levelling/Cut and Fill

2.63 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 in accordance with a Construction and Environmental Management Plan (CEMP) to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment etc. (refer to Chapter 7 – Land, Soil and Hydrogeology and Chapter 14 – Waste Management of this EIA Report for further details).

2.64 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 Proposed Development will require the importation of c. 22,000m^3 of fill material. The fill material will be sourced from various locations within the Greater Dublin Area to facilitate construction of the Permitted Development. The impact of this has been assessed within Chapter 12 – Traffic and Transportation.

2.65 Contractors for the Proposed Development will be required to submit to the Planning Authority 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 finalised Construction Environmental Management Plan (CEMP) to be updated by the contractor from the draft CEMP submitted as part of this planning application pack. This will prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment etc. Please refer to Chapter 10 – Air quality and Climate of this EIA Report for further details).

Building Envelopes and Finishes

2.66 The outer finishing of the building envelopes are intended to be of a similar quality and appearance to the Permitted Development and concurrent application for the ICT facility. Reinstatement along the 110kV transmission lines will be as current, i.e. grassed in greenfield areas and hardstand along paved areas and roads.

Roads, services and landscaping

2.67 The internal road system will be completed as part of the Permitted Development under SD20A/0058. Landscaping will be undertaken in accordance with the Permitted Development's landscape plan, and as supplemented under this application that mirrors the changes proposed under the concurrent application along Peamount Road. The permitted and proposed landscaping scheme to the west, east and south of the Substation will be in place within the first planting season following the completion of this Substation in summer 2023 (refer to Chapter 11 Landscape and Visual Impact of this EIA Report for further details).

Material sourcing, transportation and storage

Materials

2.68 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 and waste management on site.

Sourcing

2.69 Where possible it is proposed to source general construction materials from the Dublin area to minimize transportation distances.

Storage

2.70 Aggregate materials such as sands and gravels will be stored in clearly marked stockpiles 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

2.71 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.

Waste Management

2.72 Chapter 14 contains a detailed description of waste management (including quantities and types of waste) relating to construction and operation of the Proposed Development. A site-specific Construction and Demolition Waste Management Plan prepared by AWN Consulting Ltd. is included as Appendix 14.1 of this EIA Report. This C&D Waste Management Plan will be refined and updated by the appointed contractor in advance of the works to ensure best practice is followed in the management of waste from the Proposed Development.

Noise, Vibration and Dust Nuisance Prevention

2.73 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. Mitigation measures will be implemented during the construction of the Proposed Development, that will include:

- 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.

2.74 Furthermore, 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.

2.75 Noise and vibration control measures are discussed in detail in Chapter 9 - Noise and Vibration of this EIA Report.

2.76 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.

2.77 In order to ensure that no dust nuisance occurs, a series of measures will be implemented during construction 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 10km/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.

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

Water discharges

2.79 The Proposed Development will require site preparation, excavations and levelling for foundations, the installation of services and landscaping. Some removal of perched rainwater from the excavation may be required. Volumes will be quite low, and all pumped water will be subject to onsite settlement before release.

2.80 During the construction phase, there is a risk of accidental pollution incidences from the following sources:

- Spillage or leakage of fuels (and oils) stored on site;
- Spillage or leakage of fuels (and oils) from construction machinery or site vehicles;
- Spillage of oil or fuel from refuelling machinery on site;
- The use of concrete and cement; and
- Storage of chemical on site.

2.81 See Chapter 8 - Hydrology for a full description of mitigation measures proposed to address all of the above.

Construction impacts

2.82 Each of the following EIA Report chapters (Chapters 3-16) 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 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 the Proposed Development planning application documentation submitted by CSEA Consulting Engineers with the application package. The contractor will ensure that all workers and sub-contractors abide by the CEMP, which will be a live document to be updated throughout the construction process.

2.83 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.

2.84 Mitigation measures to address each of these potential short to medium term effects are presented in each individual chapter of this EIA Report and contained in the CEMP.

Description of commissioning

2.85 Once the construction of the Proposed Development is completed, ESB Networks will be mobilised to complete the commissioning. Commissioning will be carried out over a period of months. Commissioning works primarily involve a suitably qualified individual connecting the relevant cables to a switchgear within the substations. Following this, energisation can take place. As there is no requirement for chemicals usage and minimal access to the route by personnel there is no likely environmental effect as a result of commissioning.

Operation of the Proposed Development

2.86 As stated in Chapter 1, EirGrid will be the transmission system operator (TSO) and ESB Networks will be the transmission asset owner (TAO). EirGrid will operate transmission stations, including the proposed new GIS substation, remotely from their control centres. However, ESB Networks will carry out all local operations on Eirgrid's behalf. ESB Networks will undertake local operational activities from the substations with only interim inspections along the underground transmission lines.

2.87 The estimated staff required are outlined in the following paragraphs.

110kV GIS substation

2.88 The 110kV GIS substation does not require any full-time staff to operate it. However, maintenance of the substation will be required by ESB Networks, including a routine weekly inspection, and a more comprehensive inspection once per year. The weekly inspection of the GIS substation will take a maximum of 8 hours on a single day and will be conducted by up to 2 staff.

2.89 In addition to the weekly inspections, more comprehensive maintenance works will take place annually on each cubicle. This will require up to 4 staff to conduct testing at the substation over a maximum period of 15 days (120 hours). It is expected that the proposed 3 new transformers (to be located south of the 110kV GIS substation) will also be inspected during this time.

Underground 110kV Transmission Lines

2.90 Once constructed, the underground transmission line will not require any staff to operate it. Instead, two ESB Networks maintenance staff will carry out a routine inspection of the asset one year after completion and once every three years thereafter.

Joint Bays

2.91 Once constructed, these joint bays will not require any staff to operate them. Instead, ESB Networks maintenance staff will inspect these bays as part of their existing overall maintenance operations at the proposed substation with a similar maintenance schedule to that described above for the proposed Peamount 110KV GIS substation. Therefore, no additional staff (above existing requirements) will be required to maintain the joint bays and thus, there will be no additional trips generated by this element of the Proposed Development.

2.92 Traffic relating to staff movements have been assessed as part of the traffic and transportation chapter of this EIA Report (Chapter 12).

Decommissioning of the Proposed Development

2.93 The lifespan of the Proposed Development is not defined but it is anticipated that it will be maintained, and periodic upgrading undertaken over a long lifetime to meet future demand and upgrade in technology. If the GIS substation is no longer required over the long term, then full decommissioning in accordance with prevailing best practice will be undertaken. Retirement of any cables will involve decoupling the cable from the switchgear. An excavation pit of approximately 10sqm will then be established. The cable to be retired will be identified within this excavation pit and spiked (to ensure that decoupling from the switchgear has been successful and the cable is not live). The cable will then be cut and capped to protect the exposed cable. The excavated pit can be reinstated using the excavated material with no import of fill required for this part of the Proposed Development. The retired cable can remain in situ in the ground, with the potential for it to be returned to operation should it be required in the future.

2.94 The decommissioning and/or removal of cable is ultimately a matter for the ESB/EirGrid in their function as TSO/TAO and does not form part of the Proposed Development.

Description of other developments

2.95 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.

Sustainability energy efficiency and resource use

2.96 Eirgrid and ESB Networks are committed to running their businesses in the most environmentally friendly way possible. ESB Networks is a subsidiary within ESB Group. The ESB Group has identified energy efficiency as a strategic priority within its Brighter Future strategy. ESB Group is a commercial semi-state-owned company (95% state-owned) and is committed to supporting and being exemplar in the delivery of Ireland's 2020 public sector targets. These targets, outlined in the fourth National Energy Efficiency Action Plan (2017 – 2020) (NEEAP), include an energy efficiency target of 33% for the public sector.

Health & safety

Design and Construction Health and Safety

2.97 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 2007-2016 (S.I. 299 of 2007, S.I. 445 of 2012, S.I. 36 of 2016) as amended and associated regulations.

2.98 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 developments.

General operational health and safety

2.99 ESB Networks has an Environmental Safety and Health Management System that will be established at the Proposed Development.

Potential impacts of the Proposed Development

2.100 The Proposed Development is to be located on EE (Enterprise and Employment) 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 a permitted Power Generation Facility and a proposed ICT facility as well as other zoned lands that will form Grange Castle West. The development,

when operational, will generate limited additional traffic, air, noise and water emissions and waste generation from activities.

2.101 During construction, there is the potential for temporary nuisance impacts from traffic, dust, noise and construction waste, if not carefully managed. All contractors will be required to adhere to the CEMP to ensure each of these potential impacts are minimised.

2.102 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.

Major accidents / disasters

2.103 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 Proposed Development has also been considered with reference to Seveso/COMAH.

Landslides, Seismic Activity and Volcanic Activity

2.104 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

2.105 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 2 Flood Risk Assessment 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

2.106 The Proposed Development will not be a Seveso/COMAH facility. The only substance stored on site controlled under Seveso/COMAH will be diesel for a single back-up generator (tank capacity $1m^3$) and the transformers (tank capacity $36m^3$) and the amounts proposed do not exceed the relevant thresholds of the Seveso directive.

Minor accidents/leaks

2.107 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 CEMP and 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.

Related development and cumulative effects

2.108 The Proposed Development is designed to support the power generation of the Power Generation Facility (PGF) granted under SDCC Reg. Ref. SD20A/0058. It is also designed to provide the power demand for the concurrent application for the ICT facility development applied for under SDCC Reg. Ref. SD20A/0324. The Permitted PGF will not be providing power to the ICT facility and has an offer from Eirgrid to provide power to the National Grid.

2.109 A brief description of this Permitted Development and the concurrent application is provided in paragraph 2.9 and 2.10 of this Chapter and in more detail in Chapter 3 – Planning and Development

Context. The concurrent and separate planning application was also subject to an EIA Report. The Proposed Development will be constructed at the same time as the Permitted Development.

2.110 The cumulative impact of the Proposed Development with the Permitted Development during the construction phase; and the entire Permitted Development as granted under Reg. Ref. SD20A/0058, and the concurrent application under SDCC Reg. Ref. SD20A/0324 during the operational phase have been considered in each chapter of this EIA Report.

2.111 Works that do not form part of the Proposed Development that will be undertaken by a statutory undertaker have also been cumulatively assessed under this EIA Report. It is unlikely that more than two developments would ever be under construction concurrently. If such a scenario did occur, due to the phased nature of the works, it is likely that one of the buildings would be at the superstructure stage of construction whilst the other would be in the earlier stages of construction.

2.112 A list of the other developments considered to be relevant is provided in Chapter 3 (Planning and Development Context). The cumulative impact assessment is provided in each chapter of this EIA Report. The implementation of all mitigation measures set out under this EIA Report and under the EIA Report for the Permitted Development for each environmental aspect, will ensure that there will be no cumulative impacts arising.

3. PLANNING AND DEVELOPMENT CONTEXT

3.1 The Proposed Development is within the functional area of South Dublin County Council (SDCC). 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.

3.2 The Applicant is applying to ABP for planning permission for the Proposed Development. The project is designed to support the generation of power from the permitted Power Generation Facility that was granted under SDCC Planning Reg. Ref. SD20A/0058 (as detailed in Chapter 2 and within this chapter). The project is also designed, independently, to support the power required for the ICT facility applied for under SDCC Reg. Ref. SD20A/0324. This may require a separate connection in terms of transmission lines to the National Grid and a separate application to the Board. The proposed 110kV GIS substation compound of the Proposed Development is located to the south-east of the Permitted Development, within the overall landholding.

Strategic Infrastructure Development

3.3 Section 182A of the Planning & Development Act 2000 (as amended), provides that applications for approval of "*development comprising or for the purposes of electricity transmission*" shall be made directly to ABP. Section 182A, sub-section 9, also provides that "*transmission*" is to be construed in accordance with section 2(1) of the Electricity Regulation Act 1999 but shall also be construed as meaning the transport of electricity by means of:

(a) a high voltage line where the voltage would be 110 kilovolts or more, or
(b) an interconnector, whether ownership of the interconnector will be vested in the undertaker or not.

3.4 Section 2(1) of the Electricity Regulation Act 1999 defines "*transmission*", in relation to electricity, as:

*"the transport of electricity by means of a transmission system, that is to say, a system which consists, wholly or mainly, of high voltage lines and electric plant and which is used for conveying electricity from a generating station to a substation, from one generating station to another, from one substation to another or to or from any interconnector or to final customers but shall not include any such lines which the [*Electricity Supply*] Board may, from time to time, with the approval of the Commission* [for Energy Regulation]*, specify as being part of the distribution system but shall include any interconnector owned by the [*Electricity Supply*] Board."*

3.5 It should be noted that the Commission for Energy Regulation is now known as the Commission for the Regulation of Utilities (CRU). The Board's *Strategic Infrastructure Development Electricity Transmission Guidelines* provide that "*certain private sector Proposed Developments may constitute electricity transmission under section 182A where such proposals will ultimately form a node on or part of the transmission network. This might include for example substations and related connection infrastructure to the national grid associated with large commercial or industrial development*."

3.6 The Pre-application Consultation with ABP that included a meeting on the 13th November 2020 led to the Board ruling that the Proposed Development meets the relevant criteria and constitutes Strategic Infrastructure Development (SID) under Section 182A of the Planning and Development Act 2000 (as amended) (ABP Reg. Ref.: ABP-308439-20).

National Planning Framework

3.7 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.

3.8 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."

3.9 The Proposed Development comprises a substation and associated ancillary development designed to support power generation to the National Grid and the power demand for ICT and surrounding future development. A full description of the Proposed Development is available in Chapter 2 Description of the Proposed Development.

3.10 The Proposed Development comprises the provision of infrastructure that will facilitate the export of power to the National Grid and has been designed to provide power supply for the concurrent ICT facility application, in a location which is well suited and serviced to accommodate such a use. The NPF also states under National Strategic Outcome 5, A Strong Economy Supported by Enterprise, Innovation and Skills :

"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."

3.11 The NPF is favourably disposed to the location of Power Generation Facilities and ICT infrastructure in Ireland, and the Proposed Development, which comprises of such 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

3.12 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."*

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

South Dublin County Development Plan 2016-2022

3.14 The South Dublin County Development Plan (The Plan) is the statutory planning document that covers the entire South Dublin administrative area. The Plan was adopted in June 2016.

3.15 The Proposed Development is to be located within an area zoned EE (Enterprise and Employment) under the County Development Plan with the stated aim:

"*To provide for enterprise and employment related uses."*

3.16 The Proposed Development is required to facilitate the export of power to the National Grid from the PGF that received its Final Grant of permission on the 17th December 2020 under SDCC Reg. Ref. SD20A/0058. The Proposed Development is also required to provide permanent power to the ICT facility that forms a concurrent application under SDCC Reg. Ref. SD20A/0324, and is currently subject to an Additional Information request from the Planning Authority.

3.17 The County Development Plan (s. 10.2.9 supports the provision of transmission and energy infrastructure with the appropriate service providers such as ESB Networks and Eirgrid that facilitates the economic development and expansion of the County. Energy (E) Policy 11 of the County Development Plan specifically states that "*It is the policy of the Council to ensure that the provision of energy facilities is undertaken in association with the appropriate service providers and operators, including ESB Networks, Eirgrid and Gas Networks Ireland. The Council will facilitate the sustainable expansion of existing and future network requirements, in order to ensure satisfactory levels of supply and to minimise constraints for development*". The service providers and operators have been fully consulted in formulising this SID application and the applicant is in receipt of an offer from Eirgrid to facilitate the export of power from the permitted development to the National Grid.

3.18 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.

3.19 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."

3.20 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 Proposed Development retains and enhances natural site features by the use of the highest architectural and landscaping design standards.

3.21 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 does not relate to these lands.

3.22 The nature of the Permitted Development was informed by a site analysis of environmental issues and individual environmental reports were prepared and submitted with the application for development under SDCC Reg. Ref. SD20A/0058, and the concurrent application under SDCC Reg. Ref. SD20A/0342. This included noise and air quality objectives. The enhancement and creation of new bio-diversity corridors to fully integrate the Permitted and Proposed Development into the surrounding environment will 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 of both the Permitted and Proposed Development as well as the concurrent application. This mitigation of design also increases native tree planting within the site from its current position. The Permitted Development incorporates SUDS fully in accordance with policies of the Plan.

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

Sustainable Development

3.24 Irelands Framework for Sustainable Development 'Our Sustainable Future' (launched 2012 with subsequent progress report in 2015), by the Department of the Environment, Community and Local Government. It provides a framework to ensure that development is undertaken in a sustainable manner.

3.25 'Our Sustainable Future' aims to ensure that development is carried out sustainably and in an environmentally sound manner which includes optimisation of natural resources, minimisation of waste, safe and sparing use of chemicals and the application of clean technology.

3.26 All of these aspects will be integral considerations in the construction and operation of the Proposed Development on a day to day basis and are addressed within this EIA Report where appropriate.

Consultation

3.27 The Applicant and the project team have liaised with An Bord Pleanála (ABP) in advance of lodgement of the Proposed Development on **the 13th November** 2020. Previously consultation meetings were held with South Dublin County Council as part of the application for the Permitted Development in which the future GIS substation development was shown as part of future infrastructure on the 26th September 2019; and as part of the application for the ICT facility on the 8th September 2020.

3.29 EIA contributors/authors have incorporated advice and comments received into the relevant chapters of this EIA Report.

Relevant Planning history

Reg. Ref. SD20A/0058

3.9 A Final Grant of Permission was issued on the 17th December 2020 (subject to 19 no. conditions) in respect of the following development (for a Power Generation Facility and all associated elements) at the site which is the subject of this planning application that was amended under the Further Information as follows:

Demolition of the existing single storey house of 'Little Acre' and its associated garage and other buildings; demolition of the single storey stable building on the overall site; construction of a Power Generation Facility within a compound of 14,240sqm that will contain a Power Plant building with up to 7 no. 25m high flues (in 2 no. stacks; combining the individual flues from the engine units). The Power Plant building will house 7 engines and the MV/LV switchgear. The compound will also contain an AGI (Above Ground Installation) gas connection, gas compressor, water tank, water treatment, firewater tank and pumps, fuel skids and fuel tank. The proposed development also includes a battery energy storage system compound of 1,030sqm containing 17 skids including step up transformer, auxiliary power transformer, switchgear container and a total of 35 Inverters. Car parking has been increased to 14 with a turning lane on the Peamount Road, and footpath along the entire length of the frontage of the site.

3.10 The Significant Further Information / Revised Plans included a Visual Impact Assessment; Noise Impact Assessment and Air Quality Assessment as well as other information that addressed the Further Information request.

Reg. Ref. SD20A/0324

3.11 This application for an ICT facility on the site to the south-east of the proposed substation was lodged on the 9th December 2020. The development was described as including the demolition of the existing two storey dwelling of Bulmer and associated outbuildings; and demolition of the existing single storey house of Little Acre and its associated garage and other buildings; as well as the demolition of the single storey stable building on the overall site; and the construction of 2 no. two storey Information Communication Technology (ICT) facilities each with three storey plant levels and associated ancillary development that will have a gross floor area of 30,518sqm on an overall site of 8.2 hectares.

3.12 A request for Additional Information in respect of this application was made on the 11th February 2020 The applicant is currently seeking to address this request in a comprehensive manner within a reasonable timescale. Where possible, issues pertaining to matters raised in the Additional Information request we have sought to address under this application also.

3.13 As the proposed substation (which is the subject of this application and EIA Report) and the ICT facilities application (Reg. Ref. SD20A/0324) which was accompanied by an EIA Report, will now

overlap as a result of the AI request, certain elements of the ICT Facility application are included as part of this planning application and are assessed as part of the planning application and this EIA Report. This includes the demolition of the Bulmer house and associated buildings and farm buildings; as well as the full landscaping planting and berms along the boundary adjacent to the Peamount Road.

3.14 Several planning permissions have been granted in close proximity to the Proposed development site within Grange castle south Business Park in recent years. The following is just a synopsis of these.

UBC Properties LLC

Reg. Ref. SD20A/0121

3.30 The development received a Final Grant Permission from SDCC on the 3rd September 2020 on lands to the south-east of the connection to the Castlebaggot-Kilmahud circuit. This permission was subject to 23 standard conditions and work commenced on the 23rd September 2020.

3.31 The development is for three no. two storey data centres with a gross floor area of 80,269sqm to be undertaken over a ten year period. The development consists of various works that can be summarised as follows:

- Demolition of abandoned dwelling and associated buildings known as Ballybane, Old Nangor Road, Clondalkin, Dublin 22;
- Construction of three no. two storey data centre buildings (Buildings A, B and C) with mezzanine floors at each level and ancillary elements with a gross floor area of 80,269sqm;
- 1 no. two storey data centre (Building A) that will be located to the south-west of the site and will have a gross floor area of 28,573sqm. It will include 26 no. emergency generators located at ground floor level within a compound to the northern side of the data centre with associated flues that will be 25m in height. The facility will also include 26 no. ventilation shafts that will be located above the northern end of each emergency generator that will measure 20m in height;
- 1 no. two storey data centre (Building B) that will be located to the north-west of the site, and to the immediate north of Building A and will have a gross floor area of 21,725sqm. It will include 18 no. emergency generators located at ground floor level within a compound to the northern side of the data centre with associated flues that will be 25m in height. The facility will also include 18 no. ventilation shafts that will be located above the southern end of each emergency generator that will measure 20m in height;
- 1 no. two storey data centre (Building C) that will be constructed last and will be located to the eastern part of the site on a north-south axis and will have a gross floor area of 28,573sqm. It will include 26 no. emergency generators located at ground floor level within a compound to the western side of the data centre with associated flues that will be 25m in height. The facility will also include 26 no. ventilation shafts that will be located above the western end of each emergency generator that will measure 20m in height;
- Each of the three data centres will includes data storage rooms, associated electrical and mechanical plant rooms, loading bays, maintenance and storage spaces, office administration areas, and plant including PV panels at roof level as well as a separate house generator for each facility that will provide emergency power to the admin and ancillary spaces. Each data centre will also include a diesel tank and a refuelling area to serve the proposed emergency generators;
- The overall height of each data centre apart from the flues and plant at roof level is c. 19.85m above the finished floor level;
- Construction of internal road network and circulation areas, security hut (30sqm) at entrance; footpaths, provision of 150 no. car parking spaces, and 78 no. cycle parking spaces, with 50 no car parking spaces and 26 no. cycle parking spaces being provided for each building;
- single storey and temporary substation (29sqm);
- 3 no. single storey MV buildings (each 249sqm - 747sqm in total) that manage the supply of electricity from the Substations to each data centre and are located to the immediate west of the generator compound within Buildings A and B, and to the south of the generator compound within Building C;
- 8 no. prefabricated containerised electrical rooms (65sqm each and 520sqm overall) that are stacked in pairs to the immediate south of the temporary substation; and
- Ancillary site development works, that will include attenuation ponds and the installation and connection to the underground foul and storm water drainage network, and installation of utility

ducts and cables, that will include the drilling and laying of ducts and cables under the Baldonnel Stream. Other ancillary site development works will include hard and soft landscaping, lighting, fencing, signage, services road, entrance gate, sprinkler tank house (72sqm), security hut (30sqm) and 150 no. car parking spaces, and 78 no. sheltered bicycle parking spaces. The development will be enclosed with landscaping to all frontages including a wetland to the west.

An Bord Pleanála Reg. Ref. PL06S.308585

3.32 This Strategic Infrastructure Development application was lodged with the Board on the 5th November 2021 for the provision of 2 no. 110kV transmission lines and a 110kV GIS substation (Clutterland) within the eastern part of the UBC Properties overall site. The development will provide permanent power to the permitted data centres under Reg. Ref. SD20A/0121 if permission is granted. A decision on this application is due by the 13th May 2021.

CyrusOne

Reg. Ref. SD18A/0134 / ABP Ref. ABP-302813-18

3.33 Permission was granted by South Dublin County Council, which was upheld following a third party appeal, by An Bord Pleanála, for a two storey data centre with associated three storey office block and services that had a gross floor area of 35,426sqm on an overall site of 9.2 hectares on the lands to the immediate south of the application site. The data centre and office has a general dimension of being 292.2m in length by some 65.2m in width. The development had an overall height of 15.9m to the top of the parapet level and contained 64 exhaust flues (two per generator), grouped into 16 towers of four flues that are each 20m in height from the proposed ground floor level. This site is currently under construction for the first building and offices of this permitted development.

An Bord Pleanála Reg. Ref. PL06S.309146

3.34 This Strategic Infrastructure Development application was lodged with the Board on the 13th January 2021 for the provision of 2 no. 110kV transmission lines and a 110kV GIS substation (Aungierstown) within the north-east corner of the CyrusOne site. The development will provide permanent power to the permitted data centres under Reg. Ref. SD18A/0134 / ABP Ref. ABP-302813-18 if permission is granted. A decision on this application is due by the 13th July 2021.

Conclusions

3.35 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 Proposed Development will be situated on suitably zoned lands within this site identified and subject to applications that it will facilitate and adjacen to the Grange Castle West Business Park.

3.36 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.

3.37 In conclusion, it can be stated that the Proposed Development complies fully with the stated requirements of SDCC and will deliver a key piece of supporting infrastructure, which is of significant importance to the Applicant.

4. ALTERNATIVES

Introduction

4.1 EIA legislation and the prevailing Guidelines as set out in Chapter 1 of this EIA Report and best practice require that Environmental Impact Assessment Reports (EIA Reports) consider 'reasonable alternatives', for example in terms of project design, technology, location, size and scale; that have been studied, which are relevant to the Proposed Development and its specific characteristics; and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects'. This section will address:

- Do Nothing Alternative;
- Alternative project locations;
- Alternative designs/layouts;
- Alternative processes;
- Alternative technologies; and
- Alternative mitigation measures.

4.2 This chapter describes the alternatives that were considered for the Proposed Development, where applicable, under each of the headings presented in Section 4.1 and the reasons for the selection of the chosen options, including a comparison of environmental effects of the alternative options where relevant.

Do nothing alternative

4.3 In the event that the Proposed Development does not proceed, the permitted Power Generation Facility (PGF) (SDCC Reg. Ref. SD20A/0058), once constructed, would be left without the ability to export power, and the applied for ICT facility without a permanent power supply.

4.4 The Proposed Development is designed to facilitate the export of power from the Permitted Development to the National Grid within the Greater Dublin Area where there is a recognised constraint in the National Grid. Without the connection the Power Generation Facility would not be able to operate.

4.5 The permanent power supply is designed to provide the full power requirement of the ICT Facility. Without the permanent power supply the Proposed Development will provide, the ICT Facility would operate at a fraction of its capability, until such a time as another application is made, and permission gained. The land on which the Proposed Development would be located, would remain undeveloped within the site in a do-nothing scenario. The land would be utilised for the construction phases of the Permitted Development and would then recolonise as scrub following the completion of the development.

4.6 There are no environmental effects associated with the do-nothing scenario. The Do-Nothing scenario has been considered in each chapter of the EIA Report.

Alternative project locations

GIS Substation

4.7 The location of the proposed GIS substation compound was identified as part of the Permitted Development as granted under SDCC Planning Reg. Ref. SD20A/0058 (see note 10 on Figure 4.1 below of the Proposed Site Layout drawing submitted under the Permitted Development application). The transformer compound and MV Control Room are incorporated within the site identified for future development, as these are not required to facilitate the export of power from the PGF.

4.8 The location of the proposed substation under the Permitted Development, as amended under the Further Information response, and the Proposed Development has remained unchanged. Its location was assessed having regard to the environmental effects, particularly in terms of visual impact, as well as the length of the 110kV transmission line and therefore construction phase impacts as well as constraints along the route as a result of other infrastructure.

4.9 At the time of the making of the Permitted Development application for the Power Generation Facility it was unclear as to which substation or circuit that the GIS substation would connect to, with Castlebaggot and Kilmahud substations being options that were discussed with Eirgrid. The location of the proposed substation enables a stronger architectural expression to the public front of the ICT Facility as well as reducing required infrastructure to connect both the PGF and ICT facility to it in the most straightforward manner. It also enables the proposed substation to be well screened from the public domain.

4.10 Alternative site layouts were considered for the Permitted Development that included the original layout that formed the application. This had the substation in an alternative layout design parallel to the north east boundary. The visual impact of the proposed substation being located at the southern end of the site was considered as having a negative visual impact at the entrance off the public road.

4.11 Currently, a Power Generation Facility detailed in the Permitted Development has been granted planning permission under SDCC Reg. Ref. SD20A/0058 with construction due to commence later in 2021. It was not deemed practicable therefore, to consider an alternative location for the proposed 110kV GIS Substation compound during the assessment of this Proposed Development.

Figure 4.1 Permitted Development site layout plan (application boundary outlined in red) as granted under SDCC Reg. Ref. SD20A/0058 indicating future substation compound site (10) (Source: ARC:MC Architects 2020)

110kV Transmission Line Routes

4.12 The assessment of the alternative routes for the 110kV transmission lines considered various route options for the 110kV transmission line to the Castlebaggot-Kilmahud Circuit. These included routes and connection points relating to the Castlebaggot substation and Kilmahud substation. Once the connection point was established by Eirgrid, the number of alternative routes was limited to the eastern section of the route, and how it would traverse the Griffeen River, due to the need to navigate this route in a manner that minimises the potential environmental impact on the river and so that it avoids land in third party ownership beyond that of South Dublin County Council.

4.13 The route up to this point was limited in terms of alternatives due to the extent of the ICT facility application under SDCC Reg. Ref. SD20A/0324 on the main site, and the ability to utilise the Peamount Road and former Nangor Road as the route of the transmission routes.

4.14 The alternatives considered were limited to different arrangements of linking from the former Nangor Road to the connection point. The aim of the alternative routes were to minimise, where possible the length of drilling, and if possible to remain within the Old Nangor Road alignment where possible. None of the alternatives differed significantly in terms of length (c. 150m) given the short nature of this part of the route.

4.15 A preliminary appraisal of the environmental impact, road closures, water crossings, road impacts, impact on residential properties and businesses; impacts on wayleaves and easements was undertaken as part of the route selection process and this indicated a lack of alternative routes between the proposed substation and the old Nangor Road.

4.16 Construction dust related impacts to nearby sensitive receptors are the primary impacts associated with the route options. Once constructed there will be no emissions to atmosphere from the cable routes and therefore there will be no impact to air quality or climate. There are few nearby sensitive receptors that have the potential to be impacted by any of the cable route options.

4.17 A further appraisal of the environmental impacts of route options was undertaken as part of the route selection process by CSEA Consulting Engineers. In terms of the operational phase for route options, environmental impact, road closures, water crossings, road impacts, impact on residential properties and businesses; impacts on wayleaves and easements; were considered to have a ***long-term***, ***neutral*** and ***imperceptible*** impact on the environment. For the construction phase, the duration of impacts for both route options would be ***temporary*** as the works for the transmission line will have a duration of less than a year.

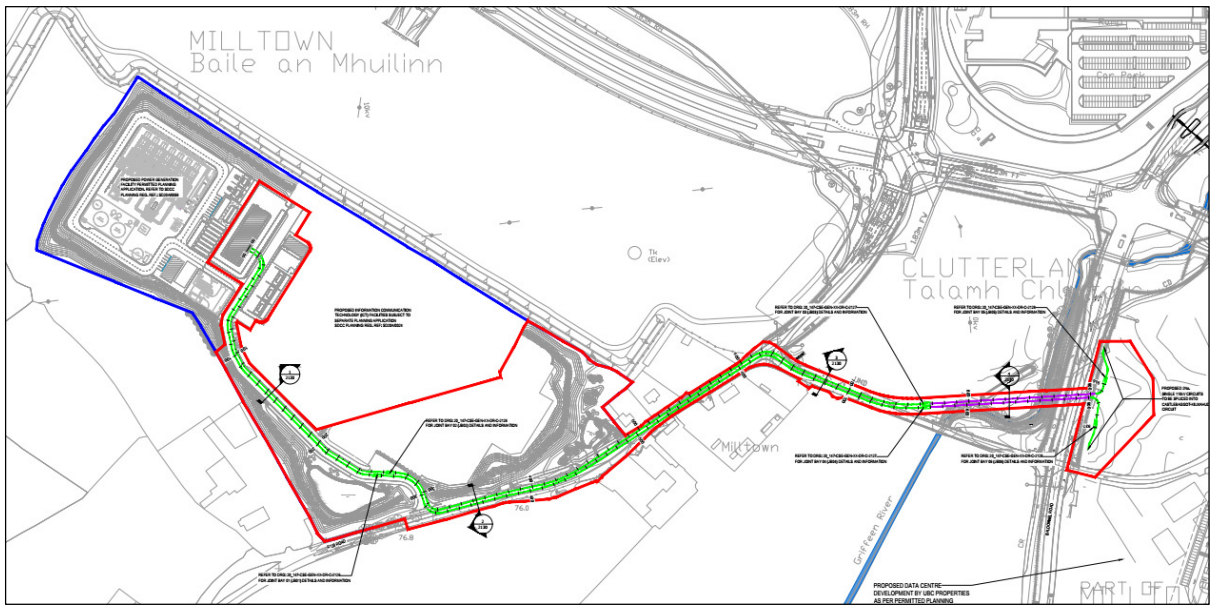

Figure 4.2 Preferred Grid Connection Route (green line), from the Castlebaggot – Kilmacud Circuit to the proposed Peamount Substation in context of application boundary (red line) and the permitted Power Generation Facility (Source: Clifton Scannell Emerson Associates March 2021)

4.18 There are no significant environmental impacts predicted for the construction phase for the chosen route as set out in the subsequent Chapters 5-16 of this EIA Report. Based on the high-level assessment of the alternative routes, it is considered that the construction phase would not result in any significant environmental impacts.

Alternative designs / layout

4.19 The proposed 110kV GIS substation compound is designed based on requirements stipulated by the TAO i.e. ESB Networks. The design of the Substation Compound is centred around the equipment requirements of ESB Networks that are required to provide an efficient and safe service. From a "design and layout" point of view, therefore, the flexibility to select alternative designs and layouts was not available to the Applicant and there are, therefore no reasonable alternatives to the layout of the proposed 110kV GIS substation compound.

4.20 Alternative design options for the 110kV transmission cables did not consider the provision of overhead lines. By their very nature, overhead lines require corridors to run along and alignments that must be clear of all other development. In the case of both a significantly wide corridor would be required. This would effectively sterilise the land in this corridor.

4.21 Two no. single circuit 110kV underground transmission lines were chosen above the overhead alternative as it enables more power to be transferred over a particular distance and requires less land to do so – minimising ecological and visual impacts of the Proposed Development and reducing installation costs.

Alternative processes and technologies

4.22 This section typically examines the project processes in relation to likely emissions to air and water, likely generation of waste and likely effect on traffic to determine the process that is least likely to impact on these parameters. The underground 110kV transmission lines will become an integral part of the national high voltage electricity grid which is currently operated by ESB Networks.

4.23 The underground cable installations must meet EirGrid's strict specifications to ensure it will be seamlessly absorbed into the national grid infrastructure and can provide a reliable power generation, and if required a reliable power supply. From a "*process design*" point of view, therefore, the flexibility to select alternative processes for integrating into the current national grid is not available to the Applicant.

4.24 In terms of the proposed processes, the proposed GIS substation will employ the same electricity generation and transmission processes that are used by EirGrid at their other facilities in Ireland and represents the most up-to-date and state of the art processes currently available. As appropriate, alternative processes are considered on an ongoing basis by both EirGrid and ESB Networks as a part of each of their operations based on many factors including technical feasibility, environmental impact, efficiency, security, reliability and cost. Therefore, from a "*process design*" point of view, the flexibility to select alternative processes for integrating into the current national grid is not available to the Applicant. There are no reasonable alternatives available.

4.25 The proposed GIS substation is designed based on requirements stipulated by EirGrid. The design of the substation is centred around the equipment requirements of EirGrid that are required to provide an efficient and safe service. Therefore, the flexibility to select alternative technologies was not available to the Applicant.

Alternative mitigation

4.26 For each aspect of the environment, each specialist has considered the existing environment, likely impacts of the Proposed Development and reviewed feasible mitigation measures to identify the most suitable measures appropriate to the environmental setting of the Proposed Development. In making a decision on the most suitable mitigation measure the specialist has considered relevant guidance and legislation. In each case, a comparison of environmental effects was made, and the specialist has reviewed the possible mitigation measures available and considered the use of the mitigation in terms of the likely residual impact on the environment. The four established strategies for mitigation of effects

have been considered: avoidance, prevention, reduction and offsetting (not required in this development).

4.27 Mitigation measures have also been considered based on the effect on quality, duration of impact, probability and significance of effects. The selected mitigation measures are set out in each of the EIA Report Chapters 5-16 and are summarised in Chapter 2 - Appendix 2.3.

Conclusions on Alternatives

4.28 The selected route for the 110kV transmission lines is deemed to be the most suitable for the Proposed Development from an engineering and environmental perspective as they offer the shortest construction phase and thus a shorter duration of any potential environmental impacts that might arise.

4.29 During construction the proposed 110kV routes (similar to the alternative route assessed i.e. Option 2) will have a ***temporary***, ***neutral*** and ***imperceptible*** *to* ***not significant*** environmental effect. It is noted that the proposed route and the alternative route considered were considered to have a ***neutral, imperceptible, long-term*** environmental effect during the operational phase.

4.30 The design of the proposed GIS substation and new cable bays have been selected with due regard to minimising the environmental and visual impact once in situ. The selection of the design has been constrained to the standard specifications required by ESB Networks for connection to the national grid. In conclusion, it is considered that the Proposed Development and design is the most suitable choice to provide the support required to meet the power requirements of the Permitted Development.

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.

5.2 In addition, this chapter assesses 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.

5.3 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.

5.4 Natural hazards are considered in Chapter 2 and Chapter 6 - Biodiversity. Issues examined in this chapter include:

- Demography;
- Population;
- Employment;
- Social Infrastructure;
- Landscape, Amenity and Tourism;
- Natural Resources;
- Air Quality;
- Noise & Vibration;
- Material Assets;
- Traffic; and
- Health and Safety.

5.5 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. Where these topics are dealt with in further detail elsewhere in this EIA Report, the relevant chapters have been cross referenced in this Chapter. The cumulative effect is addressed in Chapter 16 of this EIA Report. Interactions are addressed in Chapter 17 of this EIA Report.

Methodology

5.6 As per Article 3 of Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU:

"1. The environmental impact assessment shall identify, describe, and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:
(a) population and human health;
(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
(c) land, soil, water, air and climate;
(d) material assets, cultural heritage and the landscape;
(e) the interaction between the factors referred to in points (a) to (d).

2. The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned."

5.7 A 2017 publication by the European Commission, Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report, considered that:

"Human health is a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population."

5.8 This chapter will follow these EC guidelines, and will examine the health effects relevant to the Proposed Development as they relate to a relevant, defined study area. The effects of the Proposed Development on the population and human health are analysed in compliance with the requirements of the EPA Draft EIA Report Guidelines 2017.

5.9 A desktop survey of the SDCC 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). The quality, magnitude and duration of potential effects are defined in accordance with the criteria provided in the EPA Draft *EIA Report Guidelines* 2017) as outlined in Table 1.1 of Chapter 1 of this EIA Report.

Assessment of Significance and Sensitivity

5.10 The assessment of significance of is a professional appraisal based on the sensitivity of the receptor and the magnitude of effect. Within any area, the sensitivity of individuals in a population will vary. As such, it would be neither representative of the population, nor a fair representation of the range of sensitivities in a population, were an overall sensitivity classification assigned to the population in question. As such, the precautionary principle has been adopted for this assessment, which assumes that the population within the study area is of a uniformly high sensitivity.

Receiving environment

5.11 The Proposed Development is to be located on a site of c. 4.6 hectares that will primarily be located within an 8.2ha. site to the north of the Peamount Road, Milltown, Co. Dubllin. The Proposed Development and surrounding area are described in further detail in paragraphs 2.3 – 2.8 of Chapter 2 (Description of the Proposed Development). The nearest occupied residential properties are located c. 170m to the south of the substation site; and c.320m to the south-east. The transmission lines also pass within 01m of the two residential properties to the south-east.

5.12 The Proposed Development is not located directly adjacent to any areas of national or local environmental sensitivity/designation (Refer to Chapter 6 - Biodiversity for further details). The need for the Proposed Development is described in Chapter 1 of the EIA Report.

Study Area

5.13 The study area selected for the assessment of the impact on human health as a result of the Proposed Development was defined as the Electoral Divisions (ED) of Clondalkin-Village which extends from the centre of Clondalkin and is bounded at its western end by the New Nangor Road to the north, and the Baldonnel Road to the west and south.

Existing Baseline conditions

Population and Demographics

5.14 The Proposed Development site is located primarily within the Electoral Division (ED) with only the link to the Castlebaggot – Kilmacud Circuit being located within the Clondalkin – Dunawley ED. The site is located close to the eastern boundary of the Newcastle ED. The Newcastle Electoral Division had a population of 4,257 at the time of the 2016 Census and 3,749 at the time of the 2011 Census (Central Statistics Office (CSO). This represents a 13.5% increase in population between 2011 and 2016 i.e a population increase of 508. In the 2006 Census the Newcastle ED had a population of 2,631. Therefore the population increased by 61.8 % over the 2006 to 2016 period. It is noted that the ED includes the settlement/urban area of Newcastle which may account for a proportion of the increase in population in the ED.

5.15 Electoral Divisions are broken down into smaller areas in 2011 and 2016 to provide a more detailed understanding of local population trends for this immediate area. The Proposed Development site of the substation is located within Small Area 267107005 (as per the 2011 Census), it had a population of 518 at the time of the 2011 Census.

5.16 The Small Area boundaries relating to the subject site have been altered. In the 2016 Census the subject site is located within Small Area Sa2017-2671107005/01, a population of 317 was recorded at the time of the 2016 Census. The change in boundaries between the 2001 Census and the 2016 Census means that a direct comparison between the data (including populations/households etc.) is not possible. This is acknowledge by the specific wording of the CSO website which states "*as the small area boundaries can change between censes direct comparisons are not always possible*".

5.17 The total housing stock recorded in 2016 for the Small Area was 54, of which vacant households (excluding holiday homes) numbered 4. Notwithstanding the fact that a direct comparison between the population and housing trends within the Small Area is not possible (as referenced above). Overall the population in the immediate vicinity of the subject site is primarily one-off housing. It is reasonable to deduce that over the last 20 years the focus of the wider area has been on employment and enterprise and the increasing policy focus on housing being located on serviced and residentially zoned land within urban areas. A less detailed assessment of population has been undertaken in accordance with the Draft Guidelines (2017).

5.18 The population of the administrative area of South Dublin increased by 12.9% between 2006 and 2016, which is significantly lower in comparison to the population of the Newcastle ED (within which the subject site is located). This broadly reflects population growth that was experienced in Leinster and the State. The Small Area data has not been referenced below as the Small Area boundaries relating to the subject site were altered between the 2011 and 2016 Census.

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%
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%

5.19 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 in excess of the County, Regional and State levels, is evident in new suburban areas to the north and south that were constructed around the western fringes of Dublin during this period.

Employment

5.20 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.

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**

5.21 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.

5.22 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 four years since the most recent Census although the Coronavirus pandemic will have significantly altered this.

5.23 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 October 2020 Live Register Figures referenced above)

Social infrastructure

Residential dwellings

5.24 Residential development is primarily located to the south-west and south-east of the site (see Figure 5.1). There is one existing dwelling within the development site; Little Acre and its associated building; that is granted to be demolished as part of the permitted development under Reg. Ref. SD20A/0058. A further dwelling is located adjacent to it and bounding the Peamount Road within the application site.

This dwelling – Bulmer - remains in residential use and is proposed with other outbuildings and farm buildings, is to be demolished under this application.

5.25 There are three residential dwellings bounding the main development site. The nearest occupied residential properties are located c. 170m to the south of the proposed substation site, and with two properties c.320m to the south-east from the proposed substation. Further residential dwellings are located along the Newcastle Road to the west of the site (c.280m and 320m from the proposed substation site) and along Peamount Lane to the west of the substation site c.420m and 580m from the proposed substation site) and to the immediate east of the Peamount Hospital. These properties form a ribbon development of five houses along the eastern side of Peamount Lane.

5.26 Further residential properties are located along the Peamount Road in the form of ribbon development to the south-west of the Proposed Development site. Residential properties and other sensitive receptors within c.1km area of the Proposed Development are shown in Figure 5.1 below.

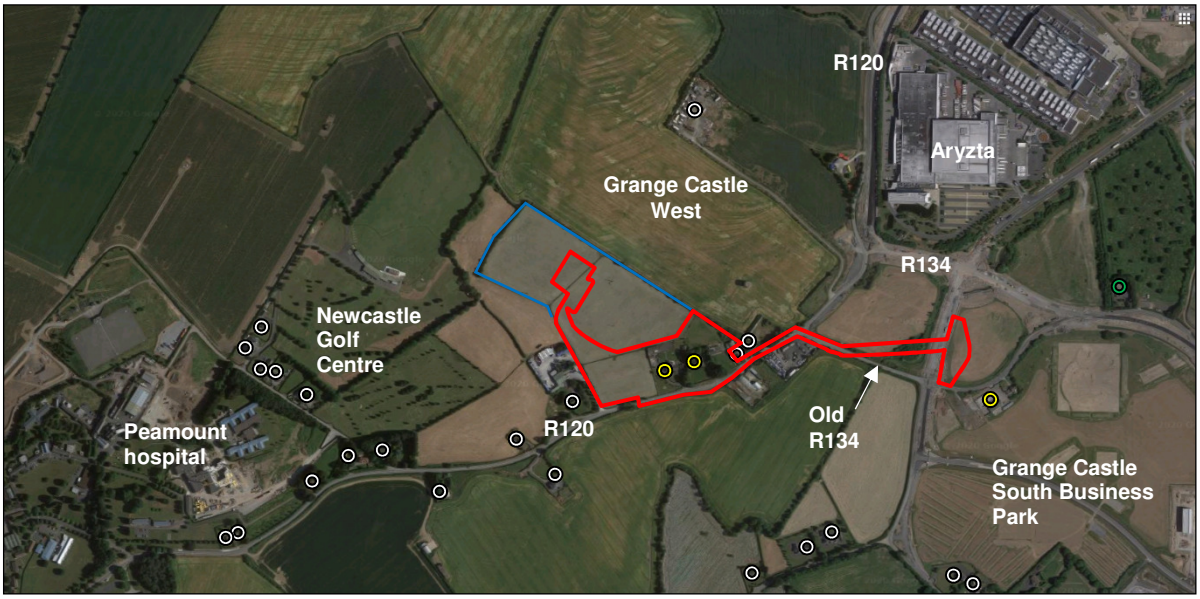

Figure 5.1 Existing land use in vicinity and outside of the subject site (Nearest existing residential properties outlined by white ring; those permitted or proposed to be demolished outlined in yellow; and existing properties that have been abandoned outlined in green)

5.27 A group of three occupied residential properties are located on Aylmer Road to the south-east of the main development site. The nearest of these properties is located some 580m from the southern extent of the substation and within 330m of the transmission line route.

5.28 A Halting site is located to the north of the main site some 290m to the north-east of the proposed substation. The site is set well back to the west of the R120. Further residential properties lie to the east of the R120 as it heads towards the Grand Canal. The nearest of which is over 800m away.

Schools

5.29 The population in the surrounding areas of Clondalkin, Newcastle, Lucan, Tallaght and Rathcoole is serviced by junior and secondary schools. The nearest schools are located in Newcastle some 3kms to the south-west; in Adamstown some 1.8kms to the north; and to the east of the R136 in Clondalkin some 2.7kms to the east. Childcare facilities are similarly distributed with the exception of a crèche at Castlebaggot House that is set-back to the south of the Baldonnel Road some 880m to the south-east of the southern extent of the main site.

Health and security

5.30 The nearest hospital to the facility is located some 6.5kms away at the Adelaide and Meath Hospital incorporating the National Children's Hospital, Tallaght, Dublin 24. The Peamount Healthcare facility sits some 600m to the south-west of the proposed substation. The nearest Garda station is 4kms away in Rathcoole and nearest fire station is 5.7kms at Belgard Road, Tallaght, Dublin 24.

Landscape, amenity and tourism

5.31 The Proposed Development will be located on the periphery of a largely built up urban area where industrial activities are the main land use. 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.) that includes the Little Acre property that is permitted to be demolished within the main site. This generally increase towards the east in the direction of Dublin city and its many tourist sites. The Newcastle Golf Centre lies some 160m to the west from the propose substation part of the site. This includes both a driving range and par 3 course. The Grange Castle Golf Club lies to the east of the Google data centre off the New Nangor Road (R134) and some 1.1km from the eastern boundary of the application site.

5.32 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 is the Grand Canal that is located some 930m to the north of the proposed substation. This is both recognised by 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 the assessment under this chapter. Further discussion of impact on landscape amenity is presented in Chapter 11 - Landscape and Visual.

Natural resources

5.33 Natural resources and land uses in the hinterland of the Proposed Development have also been considered as they may have implications for the development of the lands. Historical Ordnance Survey (OS) maps indicate that the land to the east has been in industrial/commercial use for 20-30 years. Peamount Hospital to the west of the main site has been in use as such for c. 100 years. Much of the agricultural resource in the surrounding area has already been lost over recent decades or is zoned to facilitate employment and related development in the future. There are no quarries within a 2km radius of any part of the Proposed Development site. The closest geological heritage site is the Belgard Quarry, which is located 3 km to the south-east of the site.

Land use

5.34 Land use outside of the developing employment zones to the wider north, and immediate east and west is primarily in agricultural use despite its EE zoning. Land zoned RU that provides for the protection of rural amenity is located further to the south-west and incorporates the Peamount Hospital; and to the south. The Casement Air base and its associated buildings bound the Baldonnel Road some 1.5km to the south-east of the application site.

5.35 The area in which the Proposed Development site is located lies within the functional area of South Dublin County Council. Under the Councils Development Plan, a variety of land use objectives are established for the area including specific location objectives for Grange Castle Business Park. Policy ET3 Objective supports the development of high tech development within the Grange Castle Business Park that the subject site forms a land use extension of.

5.36 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 Grange Castle and City West (existing established industrial areas) and surrounding areas are cited under section 4.3.3 of the County Development Plan 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.

5.37 Grange Castle Business Park and its extension to Grange Castle South Business Park and now to Grange Castle West, to the north of the application site, surrounding lands is already home to several industrial facilities and comprises a number of different land uses (See Figure 5.1). The Grange Castle Business Park and South Business Park contain a range of data centres as well as pharmaceutical industries. The nearest facility to the main development site is the Aryzta AG (Cuisine de France) purpose built food facility located c. 410m to the north-east of the substation site and c. 260m to the north of the transmission line to the Castlebaggot-Kilmahud circuit.

5.38 The recently permitted UBC Properties data centre complex has recently been permitted, and is under construction to the immediate south-east of the connection to the Castlebaggot-Kilmahud circuit.

5.39 To the north of the application site is the recently permitted Grange Castle West access road. Work has recently commenced on these road works that will provide vehicular access into Grange Castle West parallel to the north-east boundary of the site and some160m from this boundary.

5.57 The Proposed Development is situated on suitably EE zoned lands in an identified industrial area in south-west Dublin. 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 – Landscape and Visual Impact) relate to the protection of amenity and townland boundaries.

5.58 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.

Characteristics of the Proposed Development

5.59 The Proposed Development is described in detail within Chapter 2 of the EIA Report. The Proposed Development will include an 110kV Gas Insulated Switchgear (GIS) Substation (known as Peamount Substation), 3 no. transformer bays, Client Control Building, and all associated and ancillary development to be located on lands at Grange Castle South Business Park, Baldonnel, Dublin 22.

Potential Impact of the Proposed Development

5.60 The impact of construction, commissioning, operation and decommissioning of the Proposed Development are considered below.

Potential Impacts on Human Beings

5.61 There will be a short-term, imperceptible, positive effect on local business with the limited presence of a very small number of construction workers of 15-30 using local facilities during the construction phase of the transmission line installation. However, the main potential impacts on human beings associated with the Proposed Development will be in relation to air quality, noise and visual effects during the construction stage. The potential impacts are assessed within the corresponding chapters of this EIA Report and are summarised below.

Potential Impacts on Human Health from Air Quality

5.62 As outlined in Chapter 10 Air Quality and Climate, National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are the protection of human health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Chapter 10, Table 10.1). The standards for human health have designed to avoid harmful effects to health.

Construction phase

5.63 As detailed in Chapter 10 Air Quality & Climate, there is a potential impact on human beings due to dust generation as a result of construction activities. There is an overall negligible risk of temporary human health impact as a result of the proposed construction activities. When the dust mitigation measures and best practice measures are implemented 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-term*** and ***not significant*** with respect to human health.

Operational phase

5.64 During operation, the cables will be buried underground and therefore there will be no emissions to atmosphere. There is the potential for maintenance vehicles accessing the substation site to result in emissions of NO_2, PM_{10}/$PM_{2.5}$ and CO_2. However, due to the infrequent nature of such maintenance the potential impact on human health due to air quality during the Operational Phase is considered to be ***long-term, imperceptible*** and ***neutra****l.*

Potential Impacts on Human Health from Noise & Vibration

5.65 Noise and Vibration impacts associated with the development have been fully considered within Chapter 9 of this EIA Report. Commentary on the impact assessment and related noise levels are summarised below with respect to potential environmental health impacts.

Construction phase

5.66 As detailed in Chapter 9 Noise and Vibration, potential noise emissions associated with the construction phase of the development can be generated by construction plant and activities. These are expected to be less than the prevailing ambient noise level at the nearest sensitive locations. As a result, the existing noise environment is not expected to change significantly because of the short-term construction phase. 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 ***short-term*** and ***not significant*** with respect to human health because of the short-term construction phase.

Operational phase

5.67 The potential cumulative impact from noise and vibration with the Permitted Development is considered within Chapter 9 – Noise and Vibration Chapter of the EIA Report.

Potential Impacts on Local Amenities and Tourism

5.68 There will be no potential impact on the local parks or the larger amenity areas such as along the Grand Canal, Dublin Bay and Phoenix Park. It is not anticipated that the Proposed Development will have any potential impact on local tourism or shopping amenities. The Proposed Development will not create any wastewater discharge which could have a potential impact on local amenities or the local population. Should any discharge of construction water (collected stormwater) be required during the construction phase, discharge will be to the storm water/foul sewer drainage system or collected and removed, following appropriate treatment for sediment removal. Further information regarding surface water management can be found in Chapter 8 - Hydrology.

5.69 The underground nature of transmission lines element of the Proposed Development, together with the low sensitivity receiving environment and the existing land use and land use zoning, is such that residual landscape and visual impacts are considered to be *imperceptible* and *neutral*. Further discussion is presented in Chapter 11 - Landscape and Visual Impact.

Potential Impacts from Additional Traffic

5.70 The potential impact as a result of additional traffic on human health during construction and operation relates to added congestion, noise and pollution. An assessment of the additional traffic movements and short-term diversions associated with the Proposed Development during the construction phase is presented in Chapter 12 - Traffic and Transportation.

5.71 The potential impact of the development on human beings and in particular road users will be ***short-term, negative*** and ***not significant*** for the construction phase and ***long-term, neutral*** and ***imperceptible*** for the operational phase. Any significant construction works will take place outside of main commuter hours and at worst case a single lane carriageway will remain operational where road works are required, such as along Peamount Road, and the short length of works across the Baldonnel Road. There is no potential impact during operation.

Unplanned Events / Potential Impacts on Health and Safety

5.72 The Proposed Development has been designed in accordance with the Safety, Health and Welfare at Work Act 2005 (S.I. 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. The plant 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 ESB Networks.

5.73 The Proposed Development has the potential for an impact on the health and safety of workers employed on the site, particularly during the construction phase. The activities of contractors during the construction phase will be carried out in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013) as amended to minimise the likelihood of any impacts on worker's health and safety.

5.74 During the operational phase of the development, ESB Networks will implement an Environmental Safety and Health (EH&S) Management System and associated procedures. Full training in the EH&S Management System and relevant procedures will be provided to all employees.

5.75 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.), as well as unplanned events, 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.

5.76 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 Proposed Development is not at risk of flooding (Refer to Chapter 8). Furthermore, the permitted development design attenuation etc. has been further enhanced, as per the concurrent ICT facility application, to ensure there is no potential impact on flood risk for other neighbouring properties, nor is the site at risk from sea level rise.

5.77 The Proposed Development will not be a Seveso/COMAH facility. The only substance stored on site controlled under Seveso/COMAH will be diesel for the 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.

Remedial and mitigation measures

5.78 Mitigation measures proposed to minimise the potential effects on human health in terms of air quality and climate and noise and vibration during construction are discussed in the relevant sections of Chapters 9 and 10, respectively. Chapter 12 Traffic and Transportation addresses mitigation measures proposed to reduce the effect of additional traffic.

Residual impacts

5.79 The residual impacts on the local population during the construction phase are considered to be *short-term*, *positive* and *imperceptible* due to the expected short-term employment of a small number of construction workers directly employed to work on the construction of the transmission line and in turn creating a small amount of indirect additional business from using local businesses during the construction phase. The operation of the Proposed Development will provide an ability to permanently export power from the permitted Power Generation Facility; and subject to permission being granted has the capacity, subject to Eirgrid agreement, to provide permanent power supply to the ICT facility. The PGF, in particular, will support potential future growth outside of the site which will support

employment in the area. It is expected that the Proposed Development will have a *slight, positive* and *long-term* effect on the immediate hinterland through facilitating the provision of adequate electricity supply into the National Grid that could potentially facilitate future employment opportunities.

5.80 A health and safety management plan will be in place to ensure the health and safety of all site personnel during construction. The experience of ESB Networks and the implementation of an EH&S Management System and relevant procedures will minimise any health and safety risks during operation of the development. The cumulative impact is addressed within each chapter of this EIA Report. Interactions are addressed in Chapter 16 of this EIA Report.

Cumulative impacts

5.81 The Permitted Development, as set out in this Chapter will be undertaken at the same time as the construction phase of the Proposed Development. The proposal will create additional employment in the area with 15-30 construction workers associated with the Proposed Development. The permitted PGF is projected to generate 100 construction jobs with the concurrent application for the ICT facility projected to generate 150 jobs.

5.82 The cumulative effect of all these construction activities on local businesses during the construction phase of the Proposed Development will be a ***short-term, imperceptible, positive effect***.

5.83 The potential impact of the construction of the Proposed Development on population and human health in terms of air quality and climate; as well as noise and vibration are discussed in the relevant sections of the population and human health chapter (Chapter 5 as well as the relevant Chapters 9 and 10) of this EIA Report. There is potential for an increase in dust generation; and construction noise from machinery due to the cumulative impact of all of the permitted and committed developments with the Proposed Development. The cumulative impact of the Proposed Development on population and human health in terms of air quality and climate; as well as noise and vibration will be ***negative, short-term*** and ***not significant***.

5.84 The potential impact of the construction of the Proposed Development on population and human health in terms of Traffic & Transportation is set out in Chapter 12 of this EIA Report. The potential impact as a result of additional traffic on human health during construction relates to added congestion, noise and pollution. The ongoing nature of cumulative development will mean that there will be ***short-term***, ***neutral*** and ***not significant*** effect on population and human health due to traffic during the construction phase of the Proposed Development.

5.85 A number of the Permitted Developments listed in Chapter 3 refer to projects within the Grange Castle South Business Park to the east, which due to their greater distance from the nearest residential properties to the Proposed Development site will have an imperceptible effect on the local population. The predicted cumulative impact associated with the construction phases of these projects with the Proposed Development will be ***short-term*** and ***not significant***.

5.86 Once in full operation, the Permitted Development will coincide with that of the operational phase of the Proposed Development and ICT facility development (if granted). The EIA Report submitted with the ICT Facility indicated that it would employ 150 people, once in operation, if granted. The Permitted Development is likely to employ c. 20 people. The cumulative effect of the permitted and committed developments with the Proposed Development will be a long-term, imperceptible, positive effect on local businesses.

5.87 The Proposed Development will be in Operation at the same time as the construction of the ICT facility development, if granted, is ongoing. This will generate the potential for noise impacts associated with the construction phase of the ICT facility to occur at the same time as the operation of the Permitted and Proposed Development. Due to the larger scale nature of the Permitted Development compared to the Proposed Development the cumulative impact as a result of such a scenario would be broadly the same as projected under the construction phase with a ***neutral, short-term*** and not ***significant impact***.

5.88 The assessment under Chapter 9 (Noise and Vibration) of this EIA Report undertook a cumulative modelling exercise that took into consideration the noise generated by the Proposed Development and

Permitted Development as well as the concurrent application for an ICT facility, if permitted, once in operation. The cumulative impact of the Proposed Development with other committed or permitted developments will be ***long-term*** and ***not significant***.

5.89 There are no significant effects associated with the operation of the Proposed Development on population and human health in terms of air quality and climate. Therefore, the cumulative impact with the construction phases of the Permitted Development, and the underground cable installations will be ***long-term*** and ***not significant***. The cumulative impact with the operational phases of the Permitted Development, and the underground cable installations will be ***long-term*** and ***not significant***.

5.90 As described in Chapter 12 Traffic & Transportation, considering local planned and Permitted Developments, there will be a ***long-term, neutral*** and ***imperceptible*** cumulative effect due to the low trip generation during the operational phase of the Proposed Development with other planned and permitted development that also have low levels of operational traffic generation. The predicted cumulative impact associated with the operational phases of the Permitted Development, and the underground cable installations with the Proposed Development will be a ***long-term, neutral*** and ***imperceptible*** cumulative effect.

6. BIODIVERSITY

6.1 Scott Cawley Ltd. was commissioned to undertake an assessment of impacts on biodiversity (flora and fauna) of a Proposed Development at Grange Castle West, Milltown, Newcastle, Co. Dublin, Central Grid Reference: O 02240, 30915, (see Figure 6.1 below for location of proposed site). The Proposed Development primarily comprises the provision of two no. 110kV transmission lines and a 110kV Gas Insulated Switchgear (GIS) substation compound and Transformers/ MV switch room compound along with associated and ancillary works on an overall site of c. 4.6 hectares. This assessment was carried out in compliance with the 2014 EIA Directive, the Planning and Development Act 2000 as amended and the European Commission's guidance on the preparation of the EIA Report. The full description of the Proposed Development is outlined in Chapter 2 – Description of the Proposed Development of this EIA Report. Following ecological impact assessment guidance documents, the aims of this assessment were to:

- establish baseline ecological data for the Proposed Development site;
- determine the ecological value of the identified ecological features;
- assess the impact of the Proposed Development on ecological features of value (flora and fauna);
- apply mitigation measures to avoid, reduce, remedy or compensate impacts; and
- identify any residual impacts after mitigation.

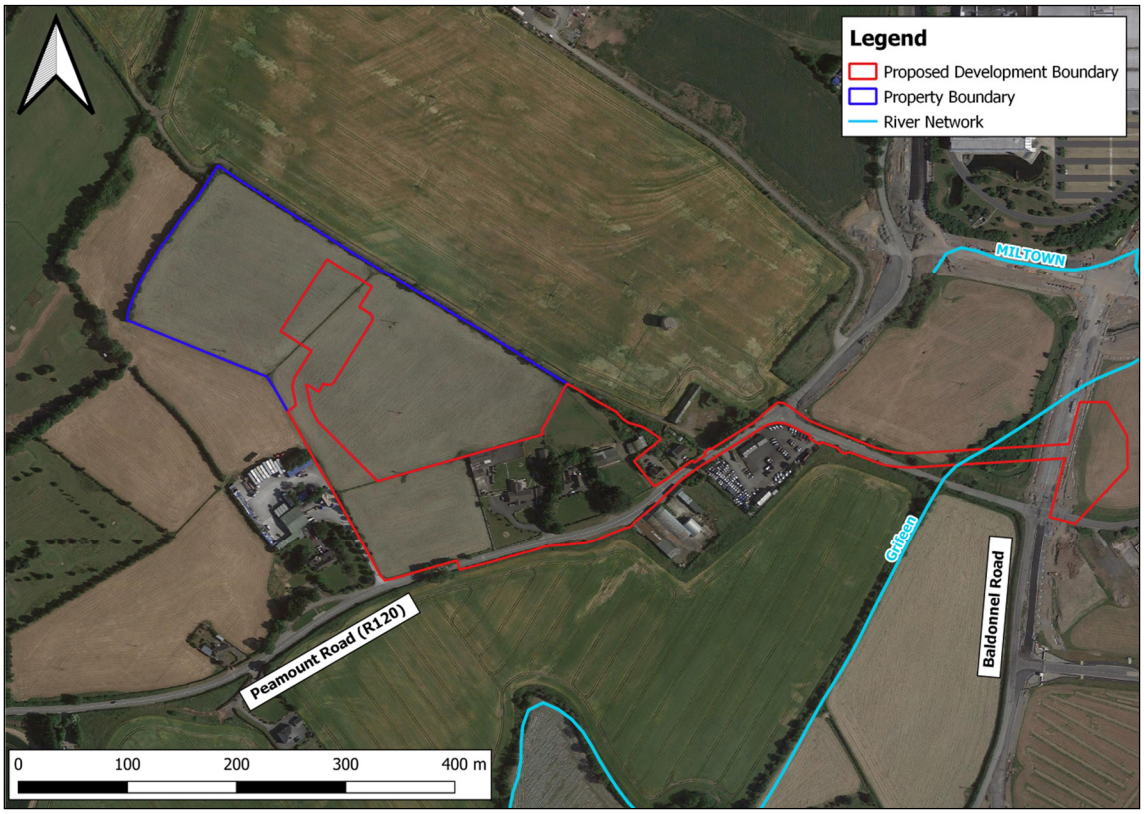

Figure 6.1 Proposed Development site (indicative site boundary) and surrounding lands.

Methodology

Relevant legislation, policy and guidelines

6.2 The assessment of the likely impacts of the Proposed Development on ecological resources has considered legislation, policy documents, and guidelines outlined in Appendix 6.1 of this report, where relevant.

Desk study

6.3 In addition to those listed in the reference section, the following resources assisted in the production of this report:

- Ordnance Survey Ireland (OSI) mapping and aerial photography available from OSI online GeoHive mapping resource. Available from http://map.geohive.ie/mapviewer.html;

- Data on protected species and European sites, available for download and interrogation from the National Parks and Wildlife Service (NPWS) maps and data page. Available from https://www.npws.ie/protected-sites;
- 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/;
- Data on waterbodies, available for download and interrogation 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 for download and interrogation 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 the location, nature and design of the Proposed Development supplied by the applicant's design team; and
- Information on the conservation status of birds in Ireland[1].
- Other Chapters of the EIA Report, where appropriate;
- The Appropriate Assessment Screening Report and the Biodiversity Chapter of the Environmental Impact Assessment Report (EIAR) submitted for the proposed information communication technology facilities, under SDCC Planning Reg. Ref. SD20A/0324, for which a request for additional information was issued by the Planning Authority on the 11th February 2021
  - Scott Cawley Ltd. (2020). Appropriate Assessment Screening Report for Proposed Information Communication Technology Facilities at Grange Castle West, Milltown, Co. Dublin; and
  - Marston Planning Consultancy (2020). Environmental Impact Assessment: Information Communication Technology Development, Grange Castle West. December 2020 – Chapter 6. Biodiversity

Field survey methodology

Habitats and flora survey

6.4 The Proposed Development site was surveyed on 10th February 2021 by Alexis Fitzgerald of Scott Cawley Ltd. following the methodology described in Best Practice Guidance for Habitat Survey and Mapping[2]. All habitats were classified using the Guide to Habitats in Ireland[3], recording dominant species, indicator species and/or species of conservation interest; with the Fossitt category codes given in parentheses. Plant nomenclature follows the BSBI's List of Accepted Plant Names[4]. Following a slight change in the red line boundary provided, a second habitat survey was carried out by Kristie Watkin-Bourne of Scott Cawley Ltd. on 24th February 2021, to cover an additional small area not previously surveyed.

Fauna survey

6.5 A general fauna survey was carried out concurrently with the habitat survey on 10th February 2021 by Alexis Fitzgerald of Scott Cawley Ltd. Terrestrial mammals 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/red-listed fauna species, and by the potential to support these species. Following a slight change in the red line boundary provided, a second terrestrial fauna survey was carried out by Kristie Watkin-Bourne of Scott Cawley Ltd. on 24th February 2021, to cover an additional small area around the Griffeen River not previously surveyed.

[1] Colhoun, K. and Cummins, S. (2013). *Birds of Conservation Concern in Ireland*. Irish Birds 9: 523-544.
[2] 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.
[3] Fossitt, A. (2000). *A Guide to Habitats in Ireland.* The Heritage Council, October 2000.
[4] BSBI (2007). *BSBI's List of Accepted Plant Names*. Available online at www.bsbi.org.

Bat surveys

6.6 Internal and external inspections of the buildings located within the Proposed Development site had previously been carried out by Scott Cawley Ltd. during daylight hours on 22nd August 2019. These buildings included the existing single storey residential property of Little Acre and its four associated outbuildings, the existing two storey residential property of Bulmer and the stable block and corrugated shed to the east of the Bulmer residential property. The only exception to the above was the four outbuildings at Little Acre which were inaccessible and thus internal inspections of these structures were not completed. A systematic inspection of the external and all accessible internal areas and roof spaces of the buildings involved a search for evidence of bats such as:

- Bat droppings (these will accumulate under an established roost or under access points);
- Insect remains (under feeding perches);
- Oil (from fur) and urine stains;
- Scratch marks;
- Pupae of bat parasites such as *Nycteribia kolenatii*; and,
- Bat corpses.

6.7 Any crevices, in so far as they could be safely accessed, were examined using a strong narrow-beamed torch and where necessary, an endoscope. Binoculars were used to examine potential bat roost features that could not be reached from the ground.

6.8 Additional external inspections of the buildings located within the Proposed Development site were carried out by Scott Cawley Ltd. during daylight hours on the 11th March 2021. The purpose of these inspections was to assess whether any significant changes, which could affect their suitability to support roosting bats, had occurred to the buildings since last inspected in 2019. As the buildings were occupied, no internal inspections were carried out due to the potential health and safety risk associated with entering inhabited buildings with respect to Covid-19.

6.9 In addition, to the building inspections undertaken in 2019, dusk and dawn surveys were carried out on the buildings within the Proposed Development site in August 2019. These surveys were undertaken on the 22nd August and 27th August 2019 by Scott Cawley Ltd. The dusk survey was carried out from 15 minutes prior to sunset to 1.5 hours after sunset (20:38). These surveys were focussed at buildings within the Proposed Development site to capture bats exiting potential roost sites at buildings. Pre-dawn re-entry surveys were carried out 1.5 hours before sunrise (06:25) up to the time of sunrise. These surveys focussed on buildings within the Proposed Development site to capture bats re-entering potential roost sites. Bat activity surveys were undertaken using direct observation and handheld ultrasound detectors (Elekon BatLogger M). Echolocation recordings were analysed using BatExplorer software. Weather conditions were mild and dry for both surveys.

6.10 The trees within the Proposed Development site were assessed for their potential to support roosting bats, having regard to the following guidelines:

- Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016);
- Bat Mitigation Guidelines for Ireland (NPWS, 2006); and,
- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (NRA, 2006).

6.11 A number of trees located along the proposed grid connection route were examined from ground level during the habitat survey on 10th February 2021 for potential to support roosting bats. They were assessed based on the presence of features commonly used by bats. Examples of such features include:

- Natural holes;
- Cracks/splits in major limbs;
- Loose bark;
- Hallows/cavities; and,
- Dense ivy cover

6.12 The suitability of potential roost features (PRFs) and habitats within the Proposed Development site were assessed and categorised according to the criteria described in Table 6.1 below.

Table 6.1 Assessment criteria for potential suitability of Proposed Development sites for bats, derived from similar criteria in Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016).

Suitability	Description of Roosting Habitat	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[5] 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 un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. 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, conditions2 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 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 in a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions2 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, tree-lined watercourses and grazed parkland. Site is close to and connected to a known roost.

Bird surveys

6.13 No dedicated breeding bird or wintering bird surveys were undertaken for this application. However, during the habitat surveys conducted on the 10th and 24th February 2021, *ad-hoc* observations of birds on, or in close proximity to, the site were made.

Ecological evaluation and impact assessment methodology

Site evaluation criteria

6.14 The criteria used to assess the ecological value (Appendix 6.2) and significance of habitats follows *Guidelines for assessment of Ecological Impacts of National Road Schemes* (NRA, 2009) and is consistent with *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* version 1.1 (CIEEM, 2018).

Impact assessment criteria

6.15 In accordance with the NRA (2009)[6] guidelines for assessment of ecological impacts, impact assessment is only undertaken of '*Key Ecological Receptors*' (KERs). KERs are within the zone of

[5] For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.
[6] National Roads Authority (NRA) (2009) Guidelines for Assessment of Ecological Impacts of National Roads Schemes. Revision 2, 1st June 2009.

influence[7] of the development and are '*both of sufficient value to be material in decision making and likely to be affected significantly*'. To qualify as KERs, features must be of local importance (higher value) or higher as per the criteria in Appendix 6.2. For example, local importance (higher value) would include locally important populations of priority species or habitats or natural heritage features identified in the Local Biodiversity Action Plan, or, sites containing semi-natural habitat types with high biodiversity in a local context, or populations of species that are uncommon in the locality. Features of lower ecological value are not assessed, and would include, for example, sites containing small areas of semi-natural habitat that are of some local importance for wildlife. The highest levels of impact significance for each Sensitive Ecological Receptor 'value' rating is shown in Table 6.2 below.

Table 6.2 Maximum level of impact significance for Sensitive Ecological Receptors

Sensitive Ecological Receptor 'value' rating	Highest possible significance level
International Importance	Significant Positive/ Negative impact at International level
National Importance	Significant Positive/ Negative impact at National level
County Importance	Significant Positive/ Negative impact at County level
Local Importance (higher value)	Significant Positive/ Negative impact at Local level

Limitations / data deficiencies

6.16 Habitat surveys were conducted in February 2021, which lies outside the optimal survey period for most higher plant species. However, plant species were confidently identified vegetatively during the February surveys undertaken and given the limited ecological value of the habitats identified on site, this is not deemed to be a limitation, in that it has not inhibited the habitat classification and does not affect the impact assessment and its conclusions.

6.17 Dedicated bat activity surveys were not carried out to inform this ecological impact assessment as surveys were carried out outside of the active bat survey season (generally taken as May- September inclusive). This is not considered to pose a significant limitation as bat surveys were previously carried out in August 2019 as part of the application for the now permitted Power Generation Facility and also informed the concurrent application for the ICT Facility that are both located on the main part of the wider site. The results of these 2019 surveys have been used to inform this ecological impact assessment with respect to potential impacts on local populations of bats. In addition, internal access to the buildings on site was not possible for the four outbuildings at Little Acre during inspections undertaken in 2019. In addition, internal access was not possible for any of the buildings during inspections carried out in March 2021. This is not considered to be a limitation considering that dusk and dawn surveys were previously carried out on the Proposed Development site in August 2019, which confirmed two bat roosts (i.e. Bulmer residential building and corrugated shed).

6.18 Dedicated breeding bird surveys were not carried out to inform this ecological impact assessment as surveys were carried out outside of the breeding bird season (March-June inclusive). This is not considered to pose a significant limitation as a precautionary approach has been taken to assume breeding birds were present onsite and suitable mitigation measures suggested to prevent impacts to breeding bird species. In light of the above, this limitation is not considered to have compromised the baseline prediction or the impact assessment.

6.19 Dedicated wintering bird surveys were not carried out to inform this ecological impact assessment. However, wintering bird surveys were carried out on the 8th October and 9th November 2019 to inform the ecological impact assessment that was submitted with the application for the Power generation Facility, which is located to the immediate north-west of the proposed substation part of the Proposed Development site. The results of these 2019 surveys have been used to inform this ecological impact assessment with respect to potential impacts on local populations of wintering birds.

[7] In accordance with NRA (2009) Guidelines, the Zone of Influence is an important term to define the receiving environment for the activities associated with the project and the biophysical changes that are likely to occur. The Zone of Influence is the 'effect area' over which change is likely to occur. This differs for different species and habitats due to varying sensitivities to potential impacts.

6.20 CIEEM survey validity guidelines[8] state that surveys are likely to be valid for 12-18 months following the survey. Surveys undertaken, as well as results of previous surveys which have been used to inform this ecological impact assessment report, fall within this 12-18 month validity range.

6.21 Despite the limitations noted above, sufficient survey data was gathered to fully inform the assessment of impacts.

Receiving environment

6.22 The Proposed Development site, of c. 4.6ha, is located to the west of Grange Castle Business Park and the surrounding lands are comprised largely of industrial developments and agricultural land. The Proposed Development site is largely comprised of agricultural grassland and hardstanding (Figure 6.1). Other habitats present within the Proposed Development site include amenity grassland, hedgerows, treelines, dry meadows and grassy verges and spoil and bare ground.

Land use zoning

6.23 The Proposed Development site is currently zoned as 'EE- Enterprise and Employment' with the objective '*To provide for enterprise and employment related uses*' under the South Dublin County Development Plan 2016-2022. Grange Castle South Business Park and Profile Park are located to the east and are also zoned as 'EE- Enterprise and Employment'. Lands in the vicinity of the Proposed Development site to the south-west are zoned as 'RU- Rural and Agriculture'. For full details on the site zoning, including zoning maps, under the South Dublin County Development Plan 2016-2022 see the Planning Report which accompanies this planning application.

Designated sites

6.24 Special Areas of Conservations (SAC) are designated under the EC Habitats Directive (92/43/EEC) as amended, 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 protected bird species listed on Annex I of the Directive, e.g. regularly occurring populations of migratory species (such as ducks, geese or waders), and areas of international importance for birds.

6.25 There are no European sites within or directly adjacent to the boundaries of the Proposed Development site. The nearest European site to the Proposed Development is the Rye Valley/Carton SAC (001398); *c.* 4.9km to the north-west and upstream in terms of the Liffey catchment. The Rye Water Valley/Carton SAC is designated for the priority Annex I habitat Petrifying springs with tufa formation (*Cratoneurion*) [*7220] and populations of the Annex II narrow-mouthed whorl snail *Vertigo angustior* and Desmoulin's whorl snail *Vertigo moulinsiana*. See Figure 6.3 for a map of European Sites located within the vicinity of the Proposed Development site.

6.26 The Proposed Development site is located within the Liffey and Dublin Bay catchment and Liffey sub-catchment. The Griffeen River is partially located within the proposed site boundary, flowing under the former Nangor Road. This river outfalls to the River Liffey *c.* 5.2km north of the Proposed Development site, which in turn discharges to the Liffey Estuary and to Dublin Bay. The Liffey outfalls to Dublin Bay *c.* 17km east and *c.* 28.2km downstream of the Proposed Development site. The Lucan stream is located *c.* 370m north-west of the Proposed Development site. This stream outfalls to the River Liffey *c.* 5km north of the Proposed Development site, which in turn discharges to the Liffey Estuary and to Dublin Bay. According to EPA online Envision Maps, the water quality of the surface, transitional and coastal water is as follows:

- River Griffeen is classified as of "Poor" water quality status (i.e. Q3) at the EPA's nearest monitoring station on the former Nangor Road;
- The Water Framework Directive (WFD) water quality status for the Lucan Stream is "Good";
- The River Liffey is classified as of "Moderate" water quality status (i.e. Q3-4) *c.* 405m downstream of the Grifeen River confluence and *c.* 1.15km downstream of the Lucan stream confluence
- The Upper Liffey Estuary is classified as "Eutrophic" transitional water;
- The Lower Liffey Estuary is classified as "Unpolluted" transitional water; and,

[8] CIEEM (2019) Advice Note on the Lifespan of Ecological Reports and Surveys

- Dublin Bay is classified as "Unpolluted" coastal water.

6.27 The Appropriate Assessment Screening Report assessed Qualifying Interests, their threats, and their underpinning conditions for all European Sites potentially affected by the development, and concluded there would be no likelihood of significant effects on any European Sites as a result of the development, either alone or in combination with other plans or projects.

6.28 Natural Heritage Areas (NHAs) are designations under the Wildlife Acts in order to protect habitats, species or geology of national importance. Many of the NHAs in Ireland overlap with Natura 2000 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 due regard to their protection in planning policies and decisions[9].

6.29 There are no NHAs within or directly adjacent to the boundaries of the Proposed Development site. The nearest nationally designated site to the Proposed Development is the Grand Canal pNHA (002104). There is no hydrological connection between the Proposed Development site and the Grand Canal pNHA *c.* 880m north of the Proposed Development site. The nearest NHA/pNHA sites to the Proposed Development with a potential impact pathway are Liffey Valley pNHA (000128); *c.* 3.9km north and *c.* 5.2km downstream via the Grifeen and the pNHAs in Dublin Bay, South Dublin Bay pNHA (000210); *c.* 16.6km east of the Proposed Development, North Dublin Bay pNHA(000206); *c.* 15.7km north-east of the Proposed Development and Dolphins, Dublin Docks pNHA(000201); *c.* 17.4km east of the Proposed Development. See Figure 6.2 for a map of Natural Heritage Areas located within the vicinity of the Proposed Development site.

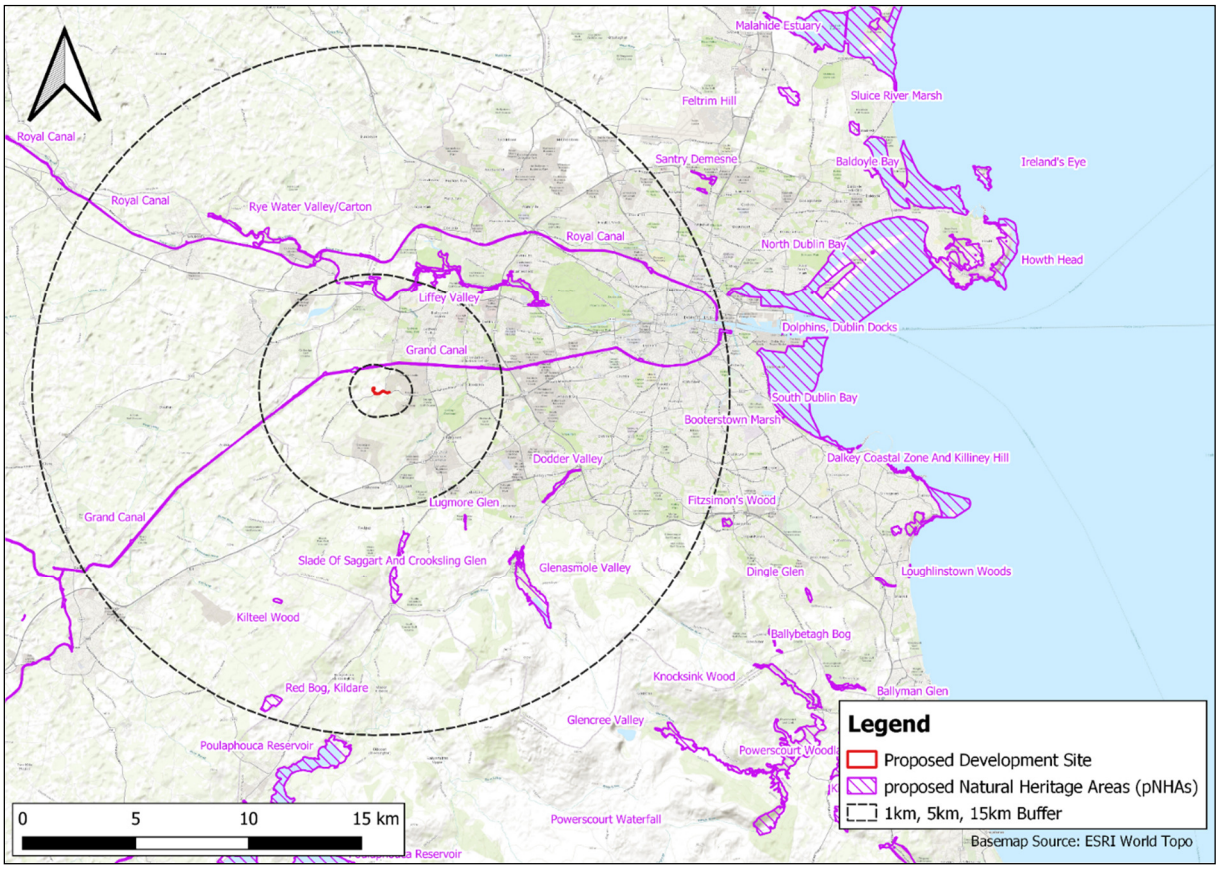

Figure 6.2 Proposed Natural Heritage Areas (pNHAs) within the vicinity of the Proposed Development

[9] Source: NPWS Website. Available online at http://www.npws.ie/protected-sites/nha. Accessed 16th February 2021

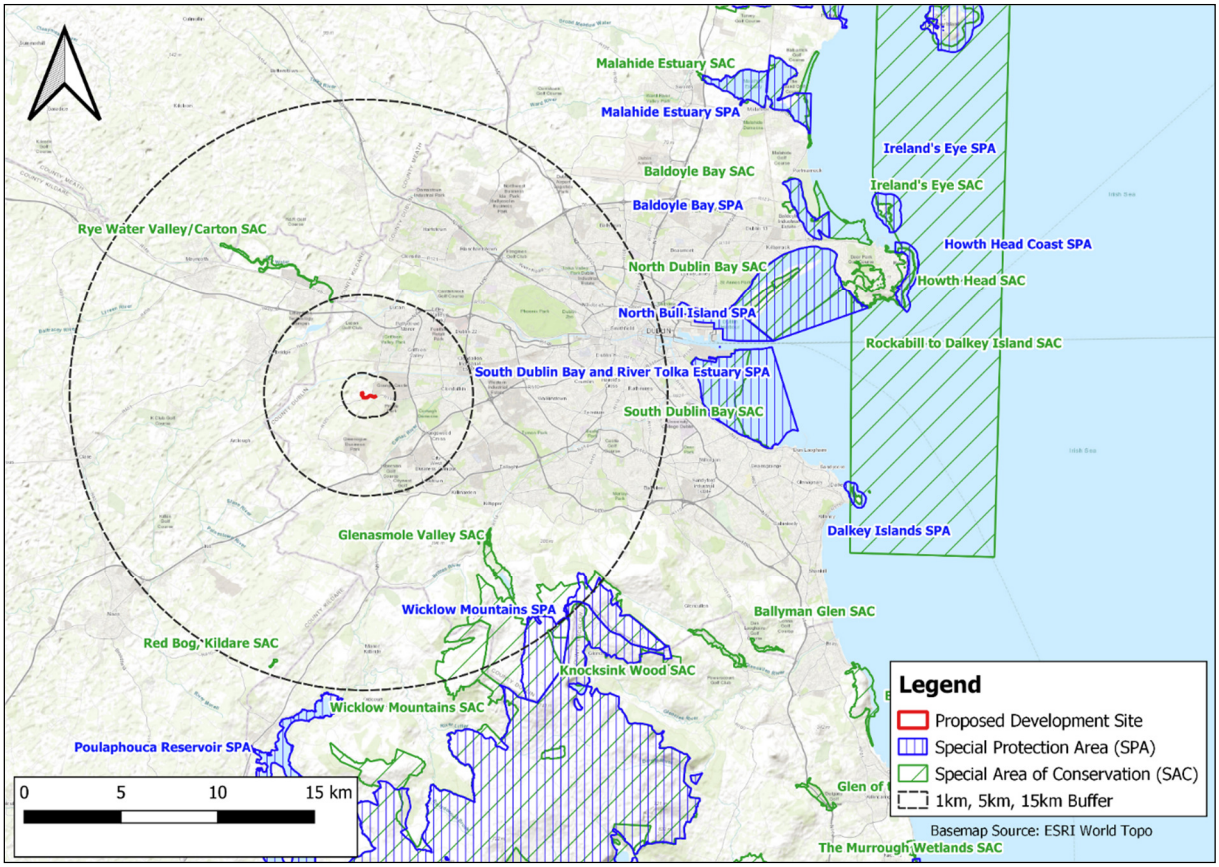

Figure 6.3 European Designated Sites located within the vicinity of the Proposed Development

Table 6.3 Designated sites located within the vicinity of the Proposed Development site and proposed Natural Heritage Areas within the vicinity of Proposed Development site.

Designated Site Name [Code] and its nature conservation features	**Location Relative to the Proposed Development Site**
Special Area of Conservation (SAC)	
Rye Water Valley/Carton SAC [001398] 7220 Petrifying springs with tufa formation (*Cratoneurion*)* 1014 Narrow-mouthed Whorl Snail *Vertigo angustior* 1016 Desmoulin's Whorl Snail *Vertigo moulinsiana* NPWS (2020) *Conservation objectives for Rye Water Valley/Carton SAC [001398].* Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.[10]	Located *c.* 4.9km north-east of the Proposed Development site
Glenasmole Valley SAC [001209] 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) 7220 Petrifying springs with tufa formation (*Cratoneurion*)* NPWS (2020) *Conservation objectives for Glenasmole Valley SAC [001209].* Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.	Located c. 8.9km south-east of the Proposed Development site
Wicklow Mountains SAC [002122] 3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)	Located c. 10.5km south-east of the Proposed Development site

[10] The versions of the conservation objectives documents referenced in this table are the most recent published versions at the time of writing.

Designated Site Name [Code] and its nature conservation features	Location Relative to the Proposed Development Site
3160 Natural dystrophic lakes and ponds 4010 Northern Atlantic wet heaths with *Erica tetralix* 4030 European dry heaths 4060 Alpine and Boreal heaths 6130 *Calaminarian* grasslands of the *Violetalia calaminariae* 6230 Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) 7130 Blanket bogs (* if active bog) 8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) 8210 Calcareous rocky slopes with chasmophytic vegetation 8220 Siliceous rocky slopes with chasmophytic vegetation 91A0 Old sessile oak woods with *Ilex* and Blechnum in the British Isles 1355 *Lutra lutra* (Otter) NPWS (2017) *Conservation Objectives: Wicklow Mountains SAC 002122*. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.	
Red Bog Kildare SAC [000397] 7140 Transition mires and quaking bog NPWS (2019) *Conservation Objectives: Red Bog, Kildare SAC 000397*. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.	Located c. 14.2km south-west of the Proposed Development site
South Dublin Bay SAC [000210] [1140] Mudflats and sandflats not covered by seawater at low tide [1210] Annual vegetation of drift lines [1310] *Salicornia* and other annuals colonising mud and sand [2110] Embryonic shifting dunes NPWS (2013) *Conservation Objectives: South Dublin Bay SAC 000210.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Located c. 16.3km east of the Proposed Development site.
North Dublin Bay SAC [000206] [1140] Mudflats and sandflats not covered by seawater at low tide [1210] Annual vegetation of drift lines [1310] *Salicornia* and other annuals colonising mud and sand [1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1395] Petalwort *Petalophyllum ralfsii* [1410] Mediterranean salt meadows (*Juncetalia maritimi*) [2110] Embryonic shifting dunes [2120] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2130] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2190] Humid dune slacks NPWS (2013) *Conservation Objectives: North Dublin Bay SAC 000206.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Located c. 19km north-east of the Proposed Development site

Special Protection Area (SPA)	
Wicklow Mountains SPA [004040] A098 Merlin *Falco columbarius* A103 Peregrine *Falco peregrinus* NPWS (2020) *Conservation objectives for Wicklow Mountains SPA [004040]*. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.	Located c. 13.8km south-east of the Proposed Development site
Poulaphouca Reservoir SPA [004063] [A043] Greylag Goose *Anser anser* [A183] Lesser Black-backed Gull *Larus fuscus* NPWS (2020) *Conservation objectives for Poulaphouca Reservoir SPA [004063]*. Generic Version 7.0. Department of Culture, Heritage and the Gaeltacht.	Located c. 15.3km south of the Proposed Development site
South Dublin Bay and River Tolka Estuary SPA [004024] [A046] Light-bellied Brent Goose *Branta bernicla hrota* [A130] Oystercatcher *Haematopus ostralegus* [A137] Ringed Plover *Charadrius hiaticula* [A141] Grey Plover *Pluvialis squatarola* [A143] Knot *Calidris canutus* [A144] Sanderling *Calidris alba* [A149] Dunlin *Calidris alpina* [A157] Bar-tailed Godwit *Limosa lapponica* [A162] Redshank *Tringa totanus* [A179] Black-headed Gull *Croicocephalus ridibundus* [A192] Roseate Tern *Sterna dougallii* [A193] Common Tern *Sterna hirundo* [A194] Arctic Tern *Sterna paradisaea* [A999] Wetland and Waterbirds NPWS (2015) *Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024*. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	Located c. 15.8km north-east of the Proposed Development site
North Bull Island SPA [004006] [A046] Light-bellied Brent Goose *Branta bernicla hrota* [A048] Shelduck *Tadorna tadorna* [A052] Teal *Anas crecca* [A054] Pintail *Anas acuta* [A056] Shoveler *Anas clypeata* [A130] Oystercatcher *Haematopus ostralegus* [A140] Golden Plover *Pluvialis apricaria* [A141] Grey Plover *Pluvialis squatarola* [A143] Knot *Calidris canutus* [A144] Sanderling *Calidris alba* [A149] Dunlin *Calidris alpina* [A156] Black-tailed Godwit *Limosa limosa* [A157] Bar-tailed Godwit *Limosa lapponica* [A160] Curlew *Numenius arquata* [A162] Redshank *Tringa totanus* [A169] Turnstone *Arenaria interpres*	Located c. 19km north-east of the Proposed Development site

[A179] Black-headed Gull *Croicocephalus ridibundus* [A999] Wetlands & Waterbirds NPWS (2015) *Conservation Objectives: North Bull Island SPA 004006.* Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	
proposed Natural Heritage Area (pNHA)	
Grand Canal pNHA [002104] The Grand Canal is a man-made waterway linking the River Liffey at Dublin with the Shannon at Shannon Harbour and the Barrow at Athy. The Grand Canal proposed Natural Heritage Area (pNHA) comprises the canal channel and the banks on either side of it. The canal system is made up of a number of branches - the Main Line from Dublin to the Shannon, the Barrow Line from Lowtown to Athy, the Edenderry Branch, the Naas and Corbally Branch and the Milltown Feeder. The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods.	Located *c.* 880m north of the Proposed Development site
Liffey Valley pNHA [000128] Diversity of flora and fauna species the river ecosystem supports, including rare and/or legally protected plant species (hairy St. John's wort *Hypericum hirsutum*, green figwort *Scrophularia umbrosa* and yellow archangel *Lamiastrum galeobdolon*)	Located *c.* 3.9km north of the Proposed Development site
Rye Water Valley/Carton pNHA [001398] Diversity of flora and fauna species the river ecosystem supports – *see also Rye Water Valley/Carton SAC in Table 1 above*	Located *c.* 4.9km north of the Proposed Development site
Royal Canal pNHA [002103] Diversity of flora and fauna species the canal ecosystem supports and the presence of legally protected plant species, opposite-leaved pondweed *Groenlandia densa*.	Located *c.* 5.9km north of the Proposed Development site
Slade of Saggart and Crooksling Glen pNHA [000211] The northern half of the site comprises a river valley with steep tree-covered sides, while the southern side is flatter and contains two small lakes, the Brittas Pond. The rare Red Data Book species Yellow Archangle (*Lamiastrum galeobdolon*) has been recorded from this site.	Located *c.* 6.2km south of the Proposed Development site
Lugmore Glen pNHA [001212] This site is a small wooded glen that supports a diversity of flora. The site is notable for the presence of the rare Red Data Book species Yellow Archangle (*Lamiastrum galeobdolon*).	Located *c.* 6.3km southeast of the Proposed Development site
Dodder valley pNHA [00991] Diversity of flora and fauna species the river ecosystem supports, including plant species such as Early-purple Orchid (*Orchis mascula*) and Bugle (Ajugareptans) and protected bird species such as Kingfisher and Grey Wagtail	Located *c.* 8.4km southeast of the Proposed Development site
Glenasmole Valley pNHA [001209] Listed under similar conservation objectives as its SAC/SPA designations.	Located *c.* 8.9km southeast of the Proposed Development site
Kilteel Wood pNHA [001394] The site is a small healthy wood of mostly oak (*Quercus* spp.) and Downy Birch (*Betula pubescens*) with a diversity of flora.	Located *c.* 10km southwest of the Proposed Development site
Red bog Kildare pNHA [000397] Listed under similar conservation objectives as its SAC/SPA designations.	Located *c.*14km southwest of the Proposed Development site
Poulaphouca Reservoir pNHA [000731] Poulaphouca Reservoir is located in the western foothills of the Wicklow Mountains. The reservoir covers an area of approximately 20 square kilometres and is the largest inland water body in the mideast and south-east regions. Poulaphouca Reservoir supports protected bird species such as Greylag Goose and Lesser Black-backed Gull	Located *c.* 15.1km south of the Proposed Development site
North Dublin Bay pNHA [000206] Listed under similar conservation objectives as its SAC/SPA designations.	Located *c.* 15.7km north-east of the Proposed Development site
South Dublin Bay pNHA [000210] Listed under similar conservation objectives as its SAC/SPA designations.	Located *c.* 16.6km east of the Proposed Development site
Dolphins, Dublin Docks pNHA [000201] Listed under similar conservation objectives as South Dublin Bay and river Tolka Estuary SPA [004024].	Located *c.* 17.4km east of the Proposed Development site

Habitats and Flora

Desktop Study Flora Records

6.30 The National Biodiversity Data Centre (NBDC) database search returned no records of protected flora species under the Flora (Protection) Order 2015 within 2km of the Proposed Development site, see Appendix 6.4.

6.31 The NBDC database search did not return any records of non-native invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 within 2km of the Proposed Development site. No non-native species, listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011, were recorded within the Proposed Development site during the habitat surveys conducted on either the 10th or 24th February 2021.

Field Survey Results

6.32 The following habitat types (following Fossitt 2000) were identified within the Proposed Development site (see Figure 6.4 on the following page for habitat map). Flora species lists by habitat are included in Appendix 6.3.

- Agricultural grassland (GA1);
- Amenity grassland (GA2);
- Dry meadows and grassy verges (GS2);
- Buildings and artificial surfaces (BL3);
- Exposed sand, gravel or till (ED1);
- Spoil and bare ground (ED2);
- Recolonising bare ground (ED3);
- Ornamental/ non-native shrub (WS3);
- Hedgerows (WL1);
- Treelines (WL2);
- Depositing/ Lowland rivers (FW2);
- Drainage ditches (FW4);
- Mixed broadleaved woodland/ immature woodland (WD1/ WS2); and;
- Scrub (WS1).

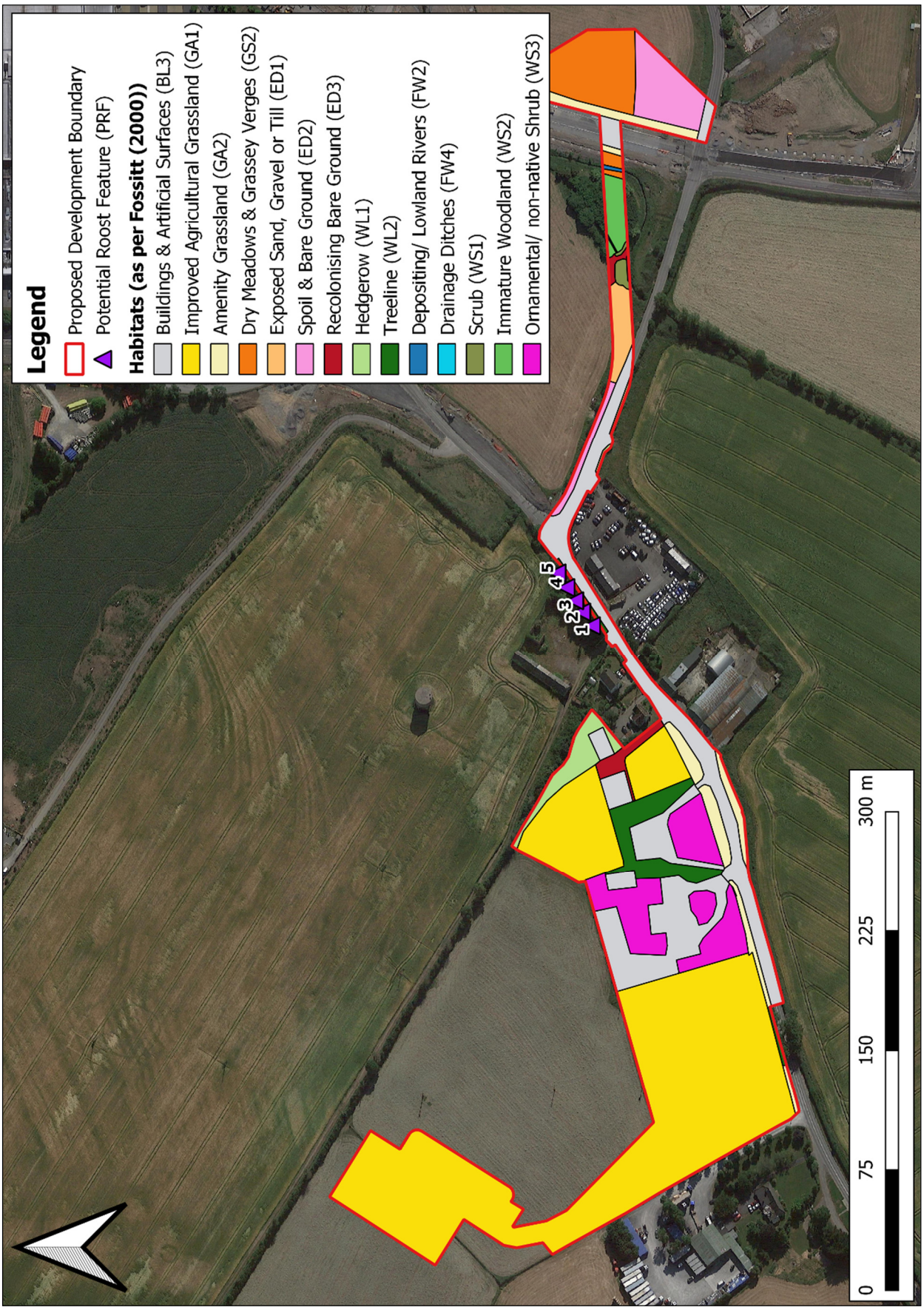

Figure 6.4 Map showing the habitat types identified and the potential roost features within the Proposed Development site (indicative site boundary) *Agricultural Grassland (GA1)*

6.33 The majority of the western section of the Proposed Development site is comprised of agricultural grassland habitat. This habitat is intensively managed for agricultural use, under regular mowing or

livestock grazing and relatively species poor. It is comprised mostly of perennial ryegrass *Lolium perenne*, ribwort plantain *Plantago lanceolata*, greater plantain *Plantago major,* nettles *Urtica dioica*, white clover *Trifolium repens*, red clover *Trifolium pratense,* yarrow *Achillea millefolium*, chickweed sp. *Stellaria sp.,* common field speedwell *Veronica persica,* meadow buttercup *Ranunculus acris,* creeping butterc*up Ranunculus repens,* red deadnettle *Lamium purpureum,* spurge species *Euphorbia sp.*

6.34 Agricultural grassland habitat is very common in the vicinity of the Proposed Development and has potential to support a limited range of fauna. The ecological value of this habitat type is considered to be of local importance (lower value).

Figure 6.5 Improved agricultural grassland (GA1) within the Proposed Development site

Amenity grassland (GA2)

6.35 There are areas of amenity grassland within the Proposed Development site along the roadside verges. These areas are intensively managed and species poor. This habitat is comprised largely of grass species including creeping bent *Agrostis stolonifera*, sweet vernal grass *Anthoxanthum odoratum*, annual meadow-grass *Poa annua* and red fescue *Festuca rubra*. Meadow buttercup was abundant and other weedy species present included white clover and broad-leaved dock *Rumex obtusifolius*. Bryophyte species recorded in this habitat included *Calliergonella cuspidata* and *Brachythecium rutabulum*.

6.36 This habitat is very common; therefore, the ecological value of this habitat type is considered to be of local importance (lower value). Additionally, this habitat has potential to support limited fauna.

Dry meadows and grassy verges (GS2)

6.37 This habitat type was identified in the eastern extent of the Proposed Development site, at the point of the proposed connection into the existing grid, just east of the realigned Baldonnel Road. Cock's-foot *Dactylis glomerata* dominated the sward here, with false oat-grass *Arrhenatherum elatius* being abundant. Broad-leaved dock was frequently encountered and red fescue, bramble *Rubus fruticosus*, meadow buttercup and creeping buttercup occurring occasionally. The bryophyte species, *Calliergonella cuspidata,* also occurred occasionally. More rarely recorded species included dandelion *Taraxacum vulgare* agg., ragwort *Senecio jacobaea*, cleavers *Galium aparine*, creeping thistle *Cirsium arvense* and bush vetch *Vicia sepium*.

6.38 This habitat type was also identified either side of the Grifeen River, to the west of the realigned Baldonnel Road. Additional species recorded here, to those listed above, include Yorkshire fog *Holcus lanatus*, ribwort plantain, wild teasel *Dipsacus fullonum* and common hogweed *Heracleum sphondylium*.

6.39 This habitat is relatively species-rich and is therefore considered to be of local importance (higher value).

Buildings and artificial surfaces (BL3)

6.40 The existing buildings, and their associated driveways, located within the Proposed Development site to the north of Peamount Road (R120) were all categorised under this habitat type. The buildings comprised residential dwellings and associated farm buildings.

6.41 Roadways such as Peamount Road (R120), the former Nangor Road and the newly realigned Baldonnel Road were all categorised under this habitat type. These areas are composed of hardstanding areas such as tarmacadam and concrete footpaths, and as such are devoid of vegetation.

6.42 Due to the absence of vegetation in this habitat type and absent botanical value, the ecological value of buildings and artificial surfaces is considered to be of local importance (lower value). However, as two of the buildings were previously confirmed to have roosting bats present, the ecological value of these roost sites in relation to the local bat population are considered in the bats section.

Exposed sand, gravel and till (ED1)

6.43 An area north of the Old Nangor Road, in the vicinity of the Griffeen River was classified as this habitat type. This area appears to have been cleared relatively recently and consists of exposed till which is devoid of vegetation.

6.44 Due to the absence of vegetation in this habitat type and absent botanical value, the ecological value of spoil and bare ground is considered to be of local importance (lower value).

Figure 6.6 View towards realigned Baldonnel Road showing exposed sand, gravel and till (ED1) in foreground.

Spoil and bare ground (ED2)

6.45 Spoil and bare ground was present along the road verge of the former Nangor Road as well as the most eastern portion of the Proposed Development site. This habitat type consisted of bare soil and was therefore devoid of vegetation.

6.46 Due to the absence of vegetation in this habitat type and absent botanical value, the ecological value of spoil and bare ground is considered to be of local importance (lower value).

Recolonising bare ground (ED3)

6.47 An area of recolonising bare ground was identified in the vicinity of the Grifeen River, between two small areas of scrub (WS1). Opportunistic plant species have started colonising this area which must have been cleared in the past. Vegetation cover is now more than 50% and species recorded included annual meadow-grass, cleavers and dandelion.

6.48 Another area of recolonising bare ground comprising an old driveway that has been recolonised by a range of weedy species is located to the north of Peamount Road (R120). Recolonising species include white clover, greater plantain, perennial ryegrass, ribwort plantain and broad-leaved dock.

6.49 Due to the transitional nature of this habitat type, its limited vegetative composition and disturbed nature, the ecological value of recolonising bare ground is considered to be of local importance (lower value).

Ornamental/ non-native shrub (WS3)

6.50 There are areas of ornamental/ non-native shrub within the gardens associated with houses on the Proposed Development site. These are in the form of topiary and therefore, are highly managed. It is unlikely that birds would nest in this habitat given the level of trimming required to maintain the shrubs. This habitat provides limited flora diversity and as such the ecological value of this habitat has been classified as being of local importance (lower value).

Figure 6.7 Ornamental/ non-native shrub (WS3) within the Proposed Development site.

Hedgerows (WL1)

6.51 Hedgerow habitat was present along Peamount Road (R120) and the former Nangor Road, both of which form part of the proposed grid connection route. Hedgerows were dominated by bramble, with less abundant species such as hawthorn *Crataegus monogyna*, ivy *Hedera helix*, cock's-foot and ragwort occurring only occasionally. Amenity grassland (GA2) occurred along the roadside edge of hedgerows recorded.

6.52 The ecological value of hedgerow habitat within the Proposed Development site has been classified as being of local importance (higher value) as they provide valuable ecological connectivity within the site and to the surrounding area. This habitat also provides a range of feeding and resting resources to birds and small mammals which are discussed in later sections.

Figure 6.8 Hedgerows (WL1) within the Proposed Development site

Treelines (WL2)

6.53 One treeline was present within the Proposed Development site. It occurred along Peamount Road (R120), just before its junction with the former Nangor Road. It was dominated by cypress species *Cupressus* sp., with white willow *Salix alba* occurring frequently. Ivy was also frequently observed, growing on mature trees. Sycamore *Acer pseudoplatanus* occurred occasionally, along with bramble. Hawthorn was rarely encountered.

6.54 A treeline also surrounds the middle residential property in the south of the Proposed Development site and comprises sycamore *Acer pseudoplatanus*, domestic apple *Malus variety,* domestic plum *Prunus Sp.,* holly *Ilex aquifolium,* cherry laurel *Prunus laurocerasus,* elder *Sambucus nigra,* ornamental *cherry Prunus variety,* wild cherry *Prunus avium,* laburnum *Laburnum anagyroides,* grey poplar *Populus canescens,* Monterey cypress *Cupressus macrocarpa,* lawson cypress *Chamaecyparis lawsoniana* and leyland cypress *Cuprocyparis leylandii* and has little limited ground flora.

6.55 Although these treelines are relatively species-poor, the ecological value of treelines is considered to be of local importance (higher value) as they provide valuable ecological connectivity within the site and to the surrounding area. The ecological value of treelines within the Proposed Development site in relation to the local biodiversity, e.g. local bat population and breeding bird population, are considered in latter sections.

Figure 6.9 Treeline (WL2) and Buildings and artificial surfaces (BL3) within the Proposed Development site

Depositing/ Lowland River (FW2)

6.56 The Griffeen River runs below the former Nangor Road, in a north-easterly direction. At the time of survey the substrate was not visible due to high water levels. The river is fast-flowing. Vegetation recorded in close proximity to the river included great willowherb *Epilobium hirsutum* which occurred frequently, and creeping bent and soft rush *Juncus effusus* which occurred occasionally. The river has been realigned in recent years and much of the banks are at present devoid of vegetation and comprise recolonising bare ground (ED3), with large boulders at the waters edge, or in more vegetated stretches, dry meadows and grassy verges (GS2).

6.57 The ecological value of depositing/ lowland river habitat within the Proposed Development site has been classified as being of local importance (higher value) as it provides valuable ecological connectivity within the site and to the surrounding area. This habitat may also provide suitable habitat for species such as otter, which are discussed in later sections.

Figure 6.10 The River Griffeen (Depositing/ lowland river habitat (FW2)) as viewed from various locations in the Proposed Development site (part 1)

Figure 6.10 The River Griffeen (Depositing/ lowland river habitat (FW2)) as viewed from various locations in the Proposed Development site (part 2).

Drainage ditch (FW4)

6.58 A small drainage ditch was identified within the red line boundary, following the original course of the Griffeen River. The water here was stagnant and there was no flow. The width of the channel was estimated at 1.5m. The depth of water could not be determined during the survey undertaken. The banks of the drainage ditch were vegetated, with mixed broadleaved woodland/ immature woodland (WD1/ WS2) occurring on both sides. Ivy, ferns and bryophytes were typical species located along the banks.

6.59 The ecological value of the drainage ditch identified within the Proposed Development site has been classified as being of local importance (higher value) as it provides valuable ecological connectivity within the site and to the surrounding area. This habitat may also provide suitable habitat for amphibian species, which are discussed in later sections.

Figure 6.11 Drainage ditch (FW4) as recorded between the area of immature woodland (WS2) within the Proposed Development site.

Immature woodland (WS2)

6.60 A relatively large area of young woodland was identified to the west of the realigned Griffeen River. This woodland did not appear to be native or semi-natural and is most likely to have been planted in the past. Trees here were approximately 4m in height. Species recorded here included hazel *Corylus*

avellana, oak *Quercus* sp. species, ash *Fraxinus excelsior* and willow species *Salix* sp. There was no understorey present, most likely due to the age of the woodland. The field layer coverage was sparse, with species such as nettle and ivy recorded.

6.61 Immature woodland recorded within the Proposed Development site was considered to be of local importance (higher value) given the potential it has to become an established broadleaved woodland in years to come. Woodland habitats are not particularly common in the local environment and these habitats can offer suitable habitat to breeding birds and mammal species.

Figure 6.12 Area of immature woodland (WS2) as recorded within the Proposed Development site.

Scrub (WS1)

6.62 Two areas of scrub were identified in the vicinity of the Griffeen River. They are separated by an area of recolonising bare ground (ED3). The larger area of scrub was dominated by willow species *Salix* sp., while the smaller area of scrub was composed of dogwood species *Cornus* sp.and bramble.

6.63 While scrub habitat may provide suitable habitat for breeding bird species, given the limited botanical value of the areas of scrub recorded in the Proposed Development site, this habitat type is considered to be of local ecological importance (lower value).

Figure 6.13 View of willow scrub (WS1) along the banks of the River Griffeen.

Fauna

6.64 A desk study and several field surveys were carried out to assess the usage of the Proposed Development site by protected/ red-listed fauna species and potential to support these species. The desk study records for rare, threatened or protected fauna species were generated from a 2km search around the Proposed Development site using the National Biodiversity Data Centre's online map viewer.

Bats

Desktop Study Records

6.65 A search of the NBDC database returned the following records, listed below with year of record, of five bat species within 2km of the Proposed Development site:

- Brown Long-eared Bat *Plecotus auratus* in 2002
- Daubenton's Bat *Myotis daubentoniid* in 2013
- Leisler's bat *Nyctalus leisleri* in 2002
- Pipistrelle species *Pipistrellus sp.* in 2002
- Soprano Pipistrelle *Pipistrellus pygmaeus* in 2013

6.66 Bat surveys conducted in August 2019, to inform the ecological impact assessment of the permitted Power Generation Facility development on lands to the north of Peamount Road (R120), identified four bat species using the area - common pipistrelle bat *Pipistrellus pipistrellus*, soprano pipistrelle bat *Pipistrellus pygmaeus,* Leisler's bat *Nyctalus leisleri* and a myotis bat species *Myotis sp.* Activity during these surveys was concentrated on linear landscape features such as treelines and hedgerows, as well as residential buildings fronting onto Peamount Road (R120). In addition, two bat roosts were discovered during the 2019 surveys - one located at the Bulmer residential property and one located in the corrugated tin shed to the east of the Bulmer residential property. These roosts are small in nature with only a single soprano pipistrelle bat being observed at each building.

6.67 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.

Field Survey Results

6.68 External inspections of buildings within the Proposed Development site included checks at two residential properties (Bulmer and Little Acre), the stable block and the corrugated shed in the east of the Proposed Development site and the four outbuildings at Little Acre. Details of the results of these inspections, including photographic evidence are included in Appendix 6.5. All buildings inspected were classified as having low suitability with features present that could support small numbers of roosting bats including wooden eaves, gaps in brickwork and loose roofing felt. However, these PRFs do not provide enough space, shelter, protection, or appropriate conditions to be used on a regular basis by large numbers of bats. It was concluded that no significant changes to the buildings had occurred since they were previously inspected in 2019. The two buildings which were previously confirmed as being used by roosting soprano pipistrelle bats, following dusk and dawn surveys conducted in August 2019 (see 6.44 above), (i.e. Bulmer residential property and corrugated shed) are therefore still considered to be bat roosts.

6.69 There are limited number of trees within the Proposed Development site. However, five trees located in a treeline along Peamount Road (R120), close to its junction with the former Nangor Road were identified as having potential to support roosting bats. These trees were considered to be of low suitability and have potential to hold no more than a small number of roosting bats. Potential roost features (PRFs) include dense ivy cover which in itself could support roosting bats and which could also conceal additional roost features on the main trunk of the tree e.g. a crack or knothole, although no feature expected to be substantial enough to hold more than small numbers of bats. Disturbed ground habitats identified in February 2021 surveys (e.g. exposed sand, gravel and till (ED1), spoil and bare ground (ED2) and recolonising bare ground (ED3)) would not be considered to be suitable habitats for local bats. Hedgerows (WL1), treelines (WL2), drainage ditches (FW4) and the Grifeen River (FW2) are all linear landscape features which could provide suitable commuting and foraging

habitat for local bats. Immature woodland (WS2) and scrub (WS1) are also habitats which are considered suitable for use by local bats. These may offer pockets of suitable foraging habitat.

Figure 6.14 Treeline identified as containing suitable trees to contain PRFs, including dense ivy

6.70 Considering the findings of the field surveys and desk study, the Proposed Development site has been valued as being of local importance (higher value) for bats as it contains linear landscape features which may be used by local bats for navigation/ foraging/ commuting purposes, as well as trees which could potentially provide roosting opportunities to small numbers of local bats.

Other Mammals

Desktop Study Records

6.71 A search of the NBDC database for records of mammal species protected under the EU Habitats Directive and/or Wildlife Acts, within the grid square O03F, within which the Proposed Development site is located, returned the following records, listed below with year of record:

- West European Hedgehog *Erinaceus europaeus* in 2012

6.72 No signs of protected mammal species were recorded during surveys undertaken in 2020 in the preparation of the application for the Power Generation Facility to the north of the wider site.

Field Survey Results

6.73 Badger *Meles meles*, and their breeding and resting places, are protected under the Wildlife Acts.

6.74 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.

6.75 No evidence of badger activity, i.e. setts, tracks, latrines or feeding signs, were made during site surveys of the Proposed Development lands in February 2021. Likewise, no evidence of otter was noted within the Proposed Development site, although otter are known to occur on the Grand Canal, *c.* 1.1km north of the Proposed Development site. No signs of otter were recorded from the Griffeen River. While mammal burrows were recorded in lands surrounding the Griffeen River they were not considered large enough to accommodate otter or badger and were most likely attributed to small rodents. Numerous mammal trails were also noted in the surrounding area and again these were most likely used by fox or smaller mammals, such as rabbits or rodents.

Figure 6.15 Mammal burrow and mammal trail identified in lands surrounding Griffeen River.

6.76 No signs of other protected mammals were noted within the Proposed Development site. Given the lack of evidence of mammals noted during the site surveys within the Proposed Development site, the local populations of mammal species such as otter and badger is valued as being of local importance (lower value).

6.77 It is possible however that the hedgerow and treeline habitat within the Proposed Development site could host populations of small mammals such as hedgehog *Erinaceus europaeus* and pygmy shrew *Sorex minutus*. Given the suitable habitat within the Proposed Development, small mammals have been valued as being of local importance (higher value).

Amphibians

Desktop Study Records

6.78 The NBDC database search did not return any records for protected amphibian species within the 2km grid square O03F, within which the Proposed Development site is located.

6.79 No signs of protected amphibian species were recorded during surveys undertaken in 2020 to inform the preparation of the EIAR for the permitted Power Generation Facility on lands to the north of Peamount Road (R120). No wetland habitats were recorded within the proposed site boundary of the submitted ICT Facility application.

Field Survey Results

6.80 No signs of amphibians were noted during the field surveys. Despite the absence of signs of amphibians, the drainage ditch identified within the Proposed Development is considered to be potentially suitable to support amphibian species due to the lack of flow. Therefore, the local amphibian population is considered to be of local importance (higher value).

Birds

Desktop Study Records

6.81 All nesting wild birds are protected from disturbance and destruction under the Wildlife Acts. Records of three Red-listed species and six Amber-listed species of Birds of Conservation Concern in Ireland (BoCCI) (Colhoun and Cummins, 2013) were returned from the 2km grid square O03F, within which the Proposed Development site is located. Red-listed, amber-listed and Annex I species recorded within 2km of the Proposed Development site are listed below with year of record:

- Black-headed gull *Larus ridibundus* in 2011

- Cormorant *Phalacrocorax carbo* in 2011
- Great-black backed gull *Larus marinus* in 2011
- Herring gull *Larus argentatus* in 2011
- Lapwing *Vanellus vanellus* in 2011
- Lesser black-backed gull *Larus fuscus* in 2011
- Little grebe *Tachybaptus ruficollis* in 2011
- Mute swan *Cygnus olor* in 2011
- Tufted duck *Aythya fuligula* in 2011

6.82 Birds recorded in lands to the north of Peamount Road (R120) in 2020 surveys undertaken to inform the preparation of the application for the permitted Power Generation Facility, included a range of common sub-urban, woodland and farmland species. Species recorded included magpie *Pica pica*, robin *Erithacus rubecula*, woodpigeon *Columba palumbus*, starling *Sturnus vulgaris*, rook *Corvus frugilegus*, hooded crow *Corvus cornix*, goldfinch *Carduelis carduelis*, blue tit *Parus caeruleus*, house sparrow *Passer domesticus*, pheasant *Phasianus colchicus*, buzzard *Buteo buteo*, grey heron *Ardea cinerea* and house martin *Delichon urbicum.*

6.83 No winter birds of interest, e.g. Amber or Red-listed species such as snipe, lapwing, other waders or waterbirds that are known to use inland wintering grounds, were recorded.

Field Survey Results

6.84 *Ad-hoc* recordings of the following bird species were made during the habitat survey of the Proposed Development site undertaken on 10th February 2021; woodpigeon, starling, tree sparrow *Passer montanus*, wren *Troglodytes troglodytes*, blackbird *Turdus merula*, magpie, hooded crow and blue tit. Birds recorded during this survey are common sub-urban species which are likely to be present throughout the year. Additional species recorded on the 24th February 2021 included pheasant and buzzard.

6.85 The majority of the Proposed Development site is comprised of roadways (e.g. Peamount Road (R120), former Nangor Road and realigned Baldonnel Road). Hardstanding associated with roadways is not a particularly important habitat with regards bird species. Boundary treelines and hedgerows, as well as immature woodland and scrub habitats, may support small populations of common bird species, such as those listed above. No flocks of wintering birds were recorded using the grassland habitat in the western section of the site in surveys carried out in 2020 or the February survey in 2021.

6.86 Habitats such as hedgerows and treelines, immature woodland and scrub, represent suitable breeding bird habitat for common sub-urban, woodland and farmland species recorded on site. As such, and due to their protection under the Wildlife Acts, the Proposed Development site has been valued as being of local importance (higher value) for breeding birds.

Summary of ecological evaluation

6.87 Table 6.4 summarises all identified key ecological receptors. Key ecological receptors have been identified as at risk of potentially significant impacts via a source-pathway-receptor link. KER's are valued as local importance (higher value) or above per the criteria set out in Appendix 2.

Table 6.4 Ecological evaluation of key ecological receptors

Ecological Receptor	Ecological Valuation	KER?
Designated Sites		
European Sites	International	**Yes**
Proposed Natural Heritage Areas (pNHAs)	National	**Yes**
Habitats		
Buildings and artificial surfaces (BL3)	Local Importance (Lower Value)	No
Improved agricultural grassland (GA1)	Local importance (Lower Value)	No
Amenity grassland (improved) (GA2)	Local Importance (Lower Value)	No
Dry meadows and grassy verges (GS2)	Local Importance (Higher Value)	**Yes**
Exposed sand, gravel and till (ED1)	Local Importance (Lower Value)	No
Spoil and bare ground (ED2)	Local Importance (Lower Value)	No
Recolonising bare ground (ED3)	Local Importance (Lower Value)	No
Hedgerows (WL1)	Local Importance (Higher Value)	**Yes**
Treelines (WL2)	Local Importance (Higher Value)	**Yes**
Depositing/ lowland rivers (FW2)	Local Importance (Higher Value)	**Yes**
Drainage ditches (FW4)	Local Importance (Higher Value)	**Yes**
Immature woodland (WS2)	Local Importance (Higher Value)	**Yes**
Scrub (WS1)	Local Importance (Lower Value)	No
Ornamental/ non-native shrub (WS3)	Local Importance (Lower Value)	No
Fauna Species		
Bats	Local importance (higher value)	**Yes**
Other mammals	Local importance (lower value)	No
Small mammals	Local importance (higher value)	**Yes**
Amphibians	Local importance (higher value)	**Yes**
Breeding birds	Local importance (higher value)	**Yes**

Characteristics of the Proposed Development

6.88 In brief, Data and Power Hub Services Ltd. are applying for permission for the provision of two no. 110kV transmission lines and a 110kV Gas Insulated Switchgear (GIS) substation compound and Transformers / MV switch room compound, along with associated and ancillary works, on lands to the south of the Power Generation Facility that was permitted under SDCC Reg. Ref. SD20A/0058 and to the north of the concurrent application for 2 no. two storey Information Communication Technology (ICT) facilities under SDCC Reg. Ref. SD20A/0324, and within an overall landholding bound to the south by the Peamount Road (R120); and on lands that contain the 2 no. residential properties of Little Acre and Bulmer as well as agricultural lands and buildings within the townlands of Milltown and Clutterland, Newcastle, Co. Dublin.

6.89 The Proposed Development also includes for the demolition of the existing two store dwelling of Bulmer and associated outbuildings and stable building. The existing Little Acre dwelling and associated buildings are permitted to be demolished under SDCC Reg. Ref. SD20A/0058.

6.90 The proposed 110kV Gas Insulated Switchgear (GIS) Substation Compound includes the provision of a two storey GIS Substation building (with a gross floor area of 1,430sqm) (known as the Peamount Substation), car parking, lighting, associated underground services and roads within a 3.0m high fenced compound, and all associated construction and ancillary works. The Transformers / MV switch room compound includes three transformers plus MV switch room (200sqm, lightning masts, car parking, associated underground services and roads within a 3.0m high fenced and separate compound, and all associated construction and ancillary works.

6.91 Two proposed underground single circuit 110kV transmission lines will connect the proposed Peamount 110kV GIS Substation to the existing 2 no. single 110kV underground circuits within the Castlebaggot-Kilmahud circuit to the east. The proposed transmission lines cover a distance of approximately 940m within the townlands of Milltown and Clutterland. They will pass outside of the site underneath the R120, the former Nangor Road, Griffeen River and the newly realigned Baldonnel Road. The installation of these underground cables will require horizontal directional drilling of approximately 150m beneath the Baldonnel Road – former Nangor Road and Griffeen River (please refer to report by Geo Drilling Solutions (2021)11 for further details within Appendix 2.4).

6.92 The development includes the connections to the proposed Peamount substation as well as to the Castlebaggot-Kilmahud circuit, as well as changes to the attenuation pond and landscaping permitted under SDCC Reg. Ref. SD20A/0058 and all associated construction and ancillary works.

6.93 The duration of the construction activities is expected to last 20 months.

6.94 Proposed Sustainable Urban Drainage Systems (SuDS) for the Proposed Development include:

- Swales running parallel to road carriageways/ footpaths;
- Attenuation/ Detention pond, with effective storage volume of 4,676m^3; and;
- Silt and Hydrocarbon interceptors for road carriageways/ carpark areas.

6.95 Controlled surface water flow at circa 56.3Litres/sec will drain to the public surface water network via SuDS devices described above. Surface water will drain off site to the existing public surface water network to the east of the site, approximately 550m away. This will necessitate laying a 225mm outfall pipe through the public roads, the R120 and the R134.

6.96 Foul drainage will discharge via a 225mm sewer to the existing 375mm public sewer to the east of the site, approximately 550m away and into the Grange Castle Waste Water Treatment Plant. During operation, foul water generated by the Proposed Development comprising 0.5m^3 a day will ultimately be discharged to the Grange Castle Waste Water Treatment Plant and then Ringsend Wastewater Treatment Plant (WWTP).

[11] Geo Drilling Solutions (2021). *Grange Castle 110kV ESB Trenchless Crossing: Feasibility assessment for the undergrounding of a 110kV cables using Horizontal Directional Drilling beneath the Baldonnel Road & Grifeen River, Clutterland, Lucan, County Dublin*. 9 February 2021.

Potential impacts of the Proposed Development / Remedial and mitigation measures

6.97 As per relevant guidelines, potential significant impacts have only been assessed for key ecological receptors (KERs), as listed in the table above. An impact is considered to be ecologically significant if it is predicted to affect the integrity or conservation status of a KER at a specified geographical scale. All impacts are described in the absence of mitigation. In addition to the above guidance, the definitions of duration have been employed as follows:

- Temporary: up to 1 year;
- Short-term: from 1-7 years;
- Medium-term: 7-15 years;
- Long-term: 15-60 years; and
- Permanent: over 60 years.

Do-nothing scenario

6.98 The existing management of the amenity grassland, improved agricultural grassland, treelines and hedgerows is expected to maintain the existing habitat types close to their current form. Areas of disturbed ground such as exposed sand, gravel or till, spoil and bare ground and recolonising bare ground may overtime become more colonised by opportunistic plant species. However this is not considered likely to greatly alter the value of this habitat type or the Proposed Development site as a whole. Areas of dry meadows and grassy verges, scrub and immature woodland are not expected to change in terms of vegetative composition. The Griffeen River and drainage ditch on site are not expected to change over time, except for the recolonisation of the banksides of the Griffeen River.

European Sites

Potential Impacts

6.99 This section describes and assesses the potential for the Proposed Development to result in likely significant effects on European sites that lie within the Zone of Influence of the Proposed Development. In the context of European sites this is focussed on the habitats and species for which the sites are selected (QIs for SACs and SCIs for SPAs) and the conservation objectives supporting their conservation status in each site. This assessment is directly related to the assessment methodology for European sites required under the Habitats Directive, which is presented in the Appropriate Assessment Screening Report for the Proposed Development that accompanies this application.

6.100 The Appropriate Assessment Screening Report (Scott Cawley Ltd., 2021) concluded there will be no likely significant effects on any European Sites either alone or in-combination with any other plans or projects for the following reasons:

- There is no possibility of direct habitat loss or loss of habitats that support populations of QI/ SCI populations of European sites as a result of the Proposed Development.
- The Proposed Development will not have any measurable effects on water quality in Dublin Bay or the Irish Sea due to the relatively low volume of any surface water run-off or discharge events and due to the level of mixing, dilution and dispersion of any surface water run-off or discharge in the receiving watercourses.
- There is no potential for hydrogeological impacts on European sites. The nearest SAC for which groundwater dependent habitats have been designated is the Rye Water Valley/ Carton SAC. The Proposed Development will not interact directly with the underlying groundwater body and lies down gradient of the Rye Water Valley/Carton SAC. Therefore, it cannot influence groundwater conditions in the European site.
- There is no risk of invasive species spreading to European sites as a result of the Proposed Development.
- There are no European sites within the disturbance Zone of Influence of the Proposed Development and the Proposed Development site does not have a supporting role as an ex-situ habitat for SCI bird species. Therefore, there are no disturbance/ displacement impacts predicted to QI/ SCI species associated with European sites.
- There is no risk of habitat degradation within European sites as a result of contaminated land as site investigations found no evidence of contamination across the site and that the site is suitable for this development.
- There is no risk of habitat degradation within European sites as a result of air pollution as discussed in the Air and Climate chapter in this report.

Mitigation Measures

6.101 As set out in the '*Potential Impacts'* section above, the Proposed Development is not likely to have a significant effect on any European sites, mitigation measures intended to avoid or reduce any harmful effects of the Proposed Development on designated sites were not required or taken into account.

Significance of Residual Effects

6.102 The assessment presented in the '*Potential Impacts'* section above concluded that there was no risk of the Proposed Development resulting in a likely significant effect on any European site, either alone or in combination with other plans or projects. Therefore, the Proposed Development is not likely to have significant residual effects on any designated sites.

Nationally Designated Sites

Potential Impacts

6.103 This section describes and assesses the potential for the Proposed Development to result in likely significant effects on Nationally Designated sites that lie within the Zone of Influence of the Proposed Development. In the case of NHAs and pNHAs the assessment considers whether the integrity[12] of any such site would be affected by the Proposed Development with reference to the ecological features for which the site is designated or is proposed.

6.104 There will be no significant impact on any nationally designated sites for the same reasons outlined above in section 6.100. No impacts on the Grand Canal pNHA are predicted as a result of the Proposed Development as it is located *c.* 880m north from the Proposed Development site and there are no source-pathway-receptor links, hydrological or otherwise.

6.105 There are no significant potential impacts on the Liffey Valley pNHA [000128] *c.* 3.9km north, North Dublin Bay pNHA [000206] *c.* 15.7km northeast, South Dublin Bay pNHA [000210] *c.* 16.6km east and Dolphins, Dublin Docks pNHA [000201] *c.* 17.4km east given the distance between these nationally designated sites and the Proposed Development site and the level of mixing, dilution and dispersion of any surface water run-off/discharges from the Proposed Development site in the receiving watercourses. The possibility of significant impacts can be excluded, and the Proposed Development will not have any measurable effects on water quality in the downstream pNHAs listed above.

Mitigation Measures

6.106 As set out in the '*Potential Impacts'* section above, the Proposed Development is not likely to have a significant effect on any Nationally Designated sites, mitigation measures intended to avoid or reduce any harmful effects of the Proposed Development on designated sites were not required or taken into account.

Significance of Residual Effects

6.107 The assessment presented in the '*Potential Impacts'* section above concluded that there was no risk of the Proposed Development resulting in a likely significant effect on any Nationally Designated site, either alone or in combination with other plans or projects. Therefore, the Proposed Development is not likely to have significant residual effects on any Nationally Designated sites.

Habitats

Potential Impacts

6.108 The Proposed Development will require the removal of KER habitats. A small amount of dry meadows and grassy verges (GS2) habitat (*c.* 2,078m^2) will be removed to allow for the connection of the proposed 110kV cables into the existing Castleboggot-Kilmahud circuit at the eastern end of the Proposed Development. In addition, approximately 197m of treeline (WL2) habitat will be removed.

6.109 There will be permanent loss of sections of these aforementioned local importance (higher value) habitats. The entrance junction to the overall site to the north of Peamount Road (R120) will be made

[12] Refer to Section 4.4.2.2 for definition and impact assessment methodology

along the southern treeline and is already permitted to facilitate the removal of the treeline of 11 ash trees to facilitate a safe sight line at the junction onto the R120. The treeline around the residential properties is to be removed to facilitate the development with one mature grey poplar *Populus canescens* to be retained. Along the hedgerow along the eastern boundary of the overall site to the north of Peamount Road (R120), approximately 6 trees within the hedgerow are to be removed. These trees are being removed due to damage by Dutch Elm disease and are categorised in the tree report as 'U' which "typically relates to trees that are dead, dying or dangerous. Such trees may present a threat or suffer from a defect or disease that is considered irremediable". Aside from the aforementioned single trees within the eastern hedgerow, all hedgerows will be retained.

6.110 Although the loss of single trees from hedgerow habitats will be permanent, considering the overall retention of the hedgerow habitat along the eastern boundary this is not considered to affect the integrity of the hedgerows or their function to act as ecological corridors for local fauna.

6.111 Woodland planting along site boundaries and on earth berms will create dense belts of native woodland spaces which act as native habitats, forming ecological corridors connecting with other landscape elements throughout the site. The connection of these spaces creates a continuous woodland belt which aids the movement of fauna through the landscape.

6.112 Significant impacts are anticipated to be temporary at a local geographical scale as the landscaping design will enhance these retained habitats. The landscaping design contains the following biodiversity enhancing measures:

- Retaining and strengthening the existing native hedgerow along the eastern boundary to link with proposed woodland planting creates biodiverse native habitats and ecological green corridors which run through the site and link with external landscape features.
- Proposed woodland planting will link with existing vegetation, creating wildlife corridors and green infrastructure links. Native woodland planting along site boundaries and on earth berms to create dense belts of native woodland spaces which act as native habitats, forming ecological corridors connecting with other landscape elements throughout the site. The connection of these spaces creates a continuous woodland belt which aids the movement of fauna through the landscape.
- A wetland space towards the south of the proposed substation site, and north of Peamount Road (R120), has been designed as a landscape feature. This space improves local biodiversity through planting small copses and micro-woodlands around the two attenuation ponds. Woodland understory planting is proposed under the trees with species such as alder *Alnus glutinosa,* hazel *Corylus avellana,* hawthorn *Crataegus monogyna,* holly *Ilex aquifolium,* wild privet *Ligustrum vulgare,* wild cherry *Prunus avium,* bird cherry *Prunus padus,* dog-rose *Rosa canina,* elder *Sambucus nigra,* rowan *Sorbus aucuparia,* gorse *Ulex europaeus* and guelder-rose *Viburnum opulus.* A wildflower meadow is proposed for intermediate areas comprising 85% grass species and 15% perennials. Woodland planting is also proposed to the south-western site boundary of the proposed substation site. A 2m wide riparian strip and wetland meadow is proposed around the attenuation pond, providing new habitats and improving local biodiversity. Native tree planting, woodland species and wildflower meadow enhance local biodiversity enhance local biodiversity and green infrastructure links through the creation of new habitats and the addition of pollinator species.

6.113 Due to the employment of horizontal directional drilling, no direct impacts to the Griffeen River or drainage ditch will occur. Likewise, no direct impacts to the immature woodland identified within the Proposed Development site is predicted. However, during construction there is potential for indirect accidental pollution impacts on watercourses in the vicinity of the Proposed Development site to occur via surface water discharges and overland flow. This impact is likely to be significant at the local geographic scale only and temporary in nature. Preventative measures are proposed in relation to this.

6.114 The proposed substation and cables to the north of Peamount Road will result in the permanent removal of improved agricultural grassland (GA1). This habitat is not considered to be a KER and therefore its removal is not considered to be ecologically significant. Likewise, the installation of the 110kV cables beneath Peamount Road and the former Nangor Road will result in the temporary loss of buildings and artificial surfaces habitat (BL3), which is of low ecological importance. The impact on these habitats of local importance (lower value) is not considered to be significant at any geographic scale.

6.115 The loss of *c.* 2,078m^2 of dry meadows and grassy verges habitat in the eastern extent of the Proposed Development is likely to be temporary in nature. An excavated trench will be required in this area to

allow for the connection of the proposed 110kV cables into the existing Castleboggot-Kilmahud circuit and this will result in the removal of a linear length of this habitat type. However, post-construction it is expected that the area will be recolonised by opportunistic plant species from the surrounding environment and overtime it will revert back to its current vegetative composition. Therefore, this impact is not considered to be significant at any geographic scale and is short-term in nature.

6.116 In the absence of any mitigation, there is the potential for damage to trees and hedgerows marked for retention. While some trees and all of the hedgerow habitat is being retained within the Proposed Development, there remains a risk of damage to the habitats arising during construction such as driving vehicles and storing materials within tree root protection zones, or through accidental machinery strikes to branches or trunks of trees. This impact, in a worst-case scenario could result in damage, degradation and death of trees and hedgerows, and potentially result in a significant impact at a local geographical scale. Therefore, the following mitigation measures are included to protect trees and hedgerows to be retained during construction.

Mitigation Measures

6.117 The following mitigation measures are proposed in relation to the protection of trees, treelines and hedgerows:

- All trees and hedgerows marked for retention will be fenced off at the outset of works and for the duration of construction to avoid damage to the trunk, branches or root systems of the trees and structures.
- Temporary fencing will be erected at a sufficient distance from the tree/ treeline/ hedgerow so as to enclose the Root Protection Area (RPA) of the tree (NRA, 2005-2011). The RPA will be calculated by a qualified arborist. In general, the RPA covers an area equivalent to a circle with a radius 12 times the stem diameter (measured at 1.5m above ground level for single stemmed trees);
- Where fencing is not feasible due to insufficient space, protection for the tree will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it. It will still be necessary to ensure that the area within the RPA is not used for vehicle parking or the storage of materials (including oils and chemicals). This measure is considered secondary to fencing of retained habitats, and should only be undertaken as a last resort;
- Weekly checks of the fences will take place by the project ecologist and/or contractor.
- Spoil materials such as rubble, topsoil, building goods and equipment, will not be placed within the RPA of trees or hedgerows.

6.118 The following mitigation measures are proposed in relation to the protection of surface waters such as the Griffeen River and drainage ditch identified within the Proposed Development site:

- A contract specific Emergency Response Plan will be prepared by the Contractor and will include an emergency work procedure to deal with any accidental/emergency spills of hazardous substances (oils, hydraulic fluids, concrete/cement etc.).
- All potentially harmful substances will be stored in compliance with the handling instruction, including separation of incompatible chemicals, provision of adequate firefighting, spill containment and other safety facilities.
- The Contractor will ensure that adequate means (Spill Kits) to absorb or contain any spillages of these chemicals are available on site at all times. Any waste or hazardous waste residuals or potentially contaminated sludge from spill clean-up will be stored in appropriate receptacles or containers, or in bunded storage areas prior to their removal by an EPA licensed contractor.
- All fuels or chemicals substances (e.g. oils, diesel, herbicides, pesticides, concrete etc) kept on the construction site will be stored in bunded containers in specified hard standing bunded areas with the provision of a storage/retention capacity of 110% of tank storage.
- No refuelling or maintenance of vehicles and equipment will be carried out within 20 metres of any watercourse.
- Any discharges arising from the construction phase will incorporate silt removal and hydrocarbon removal using a hydrocarbon interceptor (which will comply with current European Standard EN858).
- The proposed attenuation storage will be established, and the required outlet control to attenuate the discharge flow, will be constructed as early as possible in the construction stage.
- Runoff from all impermeable areas formed during the construction stage will be directed through the existing storm water storage and attenuated to the greenfield runoff rate.

- Inland Fisheries Ireland's *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters* (2016) will be adhered to throughout the construction stage of the Proposed Development.
- Foul drainage from all site facilities will be connected to the public sewer,
- When cast-in-place concrete is required, all works will be done in the dry and effectively isolated from any flowing water (or water that may enter rivers or streams) for a period sufficient to ensure no leachate from the concrete.
- No direct discharges will be made to waters where there is potential for cement or other contaminant residues in discharges.
- Designated impermeable cement washout areas will be provided.
- Any excavated vegetation, soil and subsoil will be temporarily stockpiled away at least 20m from any surface water features in order to reduce the likelihood of any suspended solids reaching them.
- Any soil contaminated from an accidental spillage will be contained and treated appropriately and disposed of in accordance with the Waste Management Act 1996-2012.
- Discharge points to the drainage network will entail a mechanism for containment of runoff. This will be used to contain any contaminated runoff in the event of a major accident on site. In the event of a fire, the shutoff valve will close and the forewater will be contained in the attenuation storage system.

Significance of Residual Effects

6.119 With regard to the KER habitats identified within the Proposed Development area, there will be a loss of :

- approximately six trees along the eastern hedgerow
- the *c.* 52m linear treeline to the north of Peamount Road (R120) to accommodate the proposed junction into the substation site
- the *c.* 145m treeline surrounding the residential properties to the north of Peamount Road (R120) and
- temporary loss of c. 2,078m^2 of dry meadows and grassy verges habitat.

6.120 However, the proposed retention of periphery hedgerows along the eastern (*c.* 494m) boundary, the extensive landscaping design summarised in section 6.90 and the mitigation strategy to protect trees and hedgerows to be retained, will minimise the temporary impact of those effects on treeline habitats over the medium to long-term. Although there will be a temporary impact on this habitat type during the construction phase until the proposed planting becomes established, following implementation of measures to protect vegetation to be retained from accidental damage, and considering the fact that the effects on dry meadows and grassy verges habitat will only be temporary in nature, potential effects of habitat loss as a result of the Proposed Development are reduced to levels not deemed significant at any geographical scale.

Bats

Potential Impacts

6.121 Part of the Proposed Development includes the demolition of the Bulmer residential property, the stable block and the corrugated tin shed. The Bulmer residential property and the Bulmer corrugated tin shed were confirmed to be actively used by small numbers (one individual was observed in both) of roosting soprano pipistrelle bats during the bat surveys in 2019. External inspections of the properties in March 2021 confirmed that no significant changes to the buildings had occurred since 2019 and therefore they are still considered to be bat roosts. Accidentally destroying a bat roost, particularly if the affected roost was a significant maternity or hibernation roost, has the potential to have long-term effects on the local bat population of the species concerned. 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 intentionally kill or injure bats or to interfere with or destroy their breeding or resting places. Under the European Communities (Birds and Natural Habitats) Regulations it is not necessary that the action should be deliberate for on offence to occur. This places an onus of due diligence on anyone proposing to carry out works that might result in such damage or destruction.

6.122 Therefore, mitigation measures are included to ensure that building demolition works do not result in bats being accidentally killed or injured during construction. Given the loss of two small roosts, in the absence of mitigation, there will be a significant impact at a local geographical scale.

6.123 A small number of trees with potential to be suitable to support roosting bats have been identified within the Proposed Development site (please refer to Fig. 6.4 for locations of suitable trees). However, these trees are not proposed to be removed as a result of the Proposed Development. Therefore, there is no potential for direct impacts on bats to occur in this regard and no mitigation is required.

6.124 Part of the Proposed Development includes the removal of two treelines and the removal of trees along the eastern hedgerows during the construction phase of the Proposed Development. The removal of these trees is not deemed to affect the overall function of these hedgerows as linear habitats of suitable foraging/commuting habitats. As such the Proposed Development will not result in fragmentation of suitable foraging habitat, as the linear eastern hedgerow will be retained, lands to the north and south of the site, which remain suitable for foraging bats, will continue to be connected via the eastern hedgerow and will be enhanced by the landscaping design summarised in section 7.90. Therefore, the Proposed Development is unlikely to affect the conservation status of the local bat population and will not result in a likely significant negative effect, at any geographic scale.

6.125 Disturbance and displacement effects may also arise from the introduction of artificial lighting during construction. The introduction of temporary artificial lighting within the immediate vicinity of the Proposed Development site during the construction stage of the Proposed Development may illuminate previously unlit feeding and/or commuting areas, making them unsuitable for bats.

6.126 No lighting during construction is anticipated for the Proposed Development and therefore there is no possibility of disturbance and displacement effects on local bats, as a result of the introduction of artificial lighting, during the construction stage of the Proposed Development.

6.127 Therefore, considering the above, the Proposed Development is unlikely to affect the conservation status of the local bat population during construction and will not result in a likely significant negative effect, at any geographic scale.

6.128 Disturbance and displacement effects may also arise from the introduction of artificial lighting, noise and an increase in human activity during operation. The operational phase of the Proposed Development will require minimal human activity at the Proposed Development.

6.129 Artificial lighting will be required in the vicinity of the proposed substation during operation. No other lighting is proposed. The proposed substation will be located in the area of improved agricultural grassland to the north of Peamount Road (R120). During bat surveys completed in 2019 to inform the ecological impact assessment of the permitted Power Generation Facility development in lands to the north of Peamount Road (R120), four bat species were recorded, and bat activity was concentrated around the residential properties fronting onto Peamount Road (R120). Bat activity within the improved grassland habitat was minimal, indicating that these lands are not of particular significance for local commuting and foraging bats. Any increase in artificial lighting in this area is therefore unlikely to be significant at any geographic scale and is highly unlikely to affect the conservation status of local bat populations. Nevertheless, mitigation in relation to the design of operational lighting have been proposed as a precautionary measure.

6.130 The Proposed Development is not predicted to result in a significant negative impact on the local bat populations during operation as a result of these disturbance effects at any geographic scale.

Mitigation Measures

6.131 All bat species and their roost sites are strictly protected under both European and Irish legislation including:

- Wildlife Act 1976 and Wildlife (Amendment) Act, 2000 (S.I. No. 38 of 2000)
- Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna 1992 (Council Directive 92/43/EEC)
- European Communities (Birds and Natural Habitats) Regulations, 2011

6.132 It is an offence under Section 23 of the Wildlife Acts 1976-2017 and under Section 51 of the European Communities (Birds and Natural Habitats) Regulations, 2011 to kill a bat or to damage or destroy the breeding or resting place of any bat species. Under the European Communities (Birds and Natural Habitats) Regulations it is not necessary that the action should be deliberate for on offence to occur. This places an onus of due diligence on anyone proposing to carry out works that might result in such damage or destruction. Under Section 54 of S.I. 477 of 2011, a derogation may be granted by the

Minister where there is no satisfactory alternative and the derogation is not detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range. Given that the proposed development will result in the loss of two small, confirmed bat roosts, a derogation licence under Section 54 of S.I. 477 of 2011 will be required from National Parks and Wildlife Service (NPWS).

6.133 Mitigation measures have been proposed with reference to practices outlined in *Bat Mitigation Guidelines for Ireland*[13] and within *Bats & Bat Boxes: Guidance Notes for Agri-environment Schemes*[14]. The aims of the mitigation strategy are to avoid disturbance of roosting bats or mortality of bats during the proposed demolition, and to provide alternative roost sites to offset the loss of known roost sites.

- **Supervision of Demolition Works:** A suitably qualified, experienced, and licenced bat worker will be employed to supervise demolition works within the proposed development site, and where necessary, remove bats from buildings. In this instance, the exclusion of bats from the buildings in advance of the commencement of works is not considered to be practically achievable in light of the potential for several small access/egress points in the building.
- Where possible, buildings confirmed as bat roosts will be demolished during the spring or autumn periods, as the risk of accidental death or injury is lower at this time. Bats may use roosts in smaller numbers in winter but may nevertheless be present.
- The following measures are proposed, should the building demolition works take place during the active bat season (April to September):
  - Presence/absence of bats will be determined by suitably qualified, experienced, and licensed ecologist(s) in advance of building demolition. Presence/absence will be determined by a combination of dusk emergence, dawn re-entry and roost inspection checks (*e.g.* using an endoscope device).
  - Immediately following completion of the above, cladding on the eves of the roof of buildings will be removed by hand by the demolition contractor, under the supervision of the licenced bat ecologist in daylight hours. The bat worker will inspect the tiles and other roof materials in advance of removal with a suitable device such as an endoscope. If bats were observed entering the roost on the night previous to the demolition works, the roofing materials will also need to be removed by hand under the supervision of the licenced bat ecologist.
  - The contractor undertaking roof demolition works will facilitate safe access for the bat worker to the roof area of buildings to allow inspection of the roof for roosting bats. Safe access may be facilitated via a scaffold, or via a Mobile Elevated Working Platform (MEWP) or similar.
  - In the event that bats are encountered during inspection of the roof, they will be removed by hand, and transferred to a bat box (for specification, refer to section below on **Provision of Alternative Roost Facilities**), which will be installed on site in advance of works.
- The following measures are proposed, should the building demolition works take place over the winter period (October to March):
  - Presence/absence of bats will be determined by suitably qualified, experienced, and licensed ecologist(s) in advance of building demolition. Presence/absence will be determined primarily by roost inspection checks (*e.g.* using an endoscope device) but may be supplemented by a combination of dusk emergence and/or dawn re-entry surveys, if weather conditions are suitable.
  - Immediately following completion of the above, cladding on the eves of the roof of buildings will be removed by hand by the demolition contractor, under the supervision of the licenced bat ecologist in daylight hours. The bat worker will inspect the tiles and other roof materials in advance of removal with a suitable device such as an endoscope. The roofing material of the buildings will be removed by hand under the supervision of the licenced bat ecologist.
  - The contractor undertaking roof demolition works will facilitate safe access for the bat worker to the roof area of the building to allow inspection of the roof for roosting bats. Safe access may be facilitated via a scaffold, or via a Mobile Elevated Working Platform (MEWP) or similar.
  - In the event that bats are encountered during inspection of the roof, they will be removed by hand, and transferred to a hibernation bat box (for specification, refer to section below on **Provision of Alternative Roost Facilities**), which will be installed on site in advance of works.

[13] Kelleher, C., and Marnell, F. (2006). *Bat Mitigation Guidelines for Ireland.* Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government.
[14] Bat Conservation Ireland (2015). *Bats & Bat Boxes: Guidance Notes for Agri-environmental Schemes*. August 2014. Updated January 2015. Available online at https://www.batconservationireland.org/wp-content/uploads/2015/05/BCIrelandGuidelines_BatBoxes.pdf

- **Provision of Alternative Roost Facilities On-site During and Post Construction**: A mixture containing two Habibat Double Chambered Rocket Box, two Schwegler type 2F boxes and four Schwegler type 1FF flat bat boxes (or similar models) will be installed on a suitable location to be determined by the bat worker/ecologist within the Proposed Development boundary. The retained treeline surrounding the Bulmers residential property is considered to be most suitable for locating bat boxes (see Figure 6.14). The tree mounted bat boxes will be installed either by the ecologist or by the contractor under the supervision of the ecologist. It is preferable that each faces a slightly different aspect from southeast to southwest facing, to provide a range of slightly differing temperature regimes (Bat Conservation Ireland, 2015). The Rocket Box is a pole mounted box which will be installed in a suitable location on site along the eastern hedgerow. All bat boxes will be installed at least 3m above ground level to minimise the risk of interference by humans. The bat boxes will be located away from areas that are subject to artificial light spill.

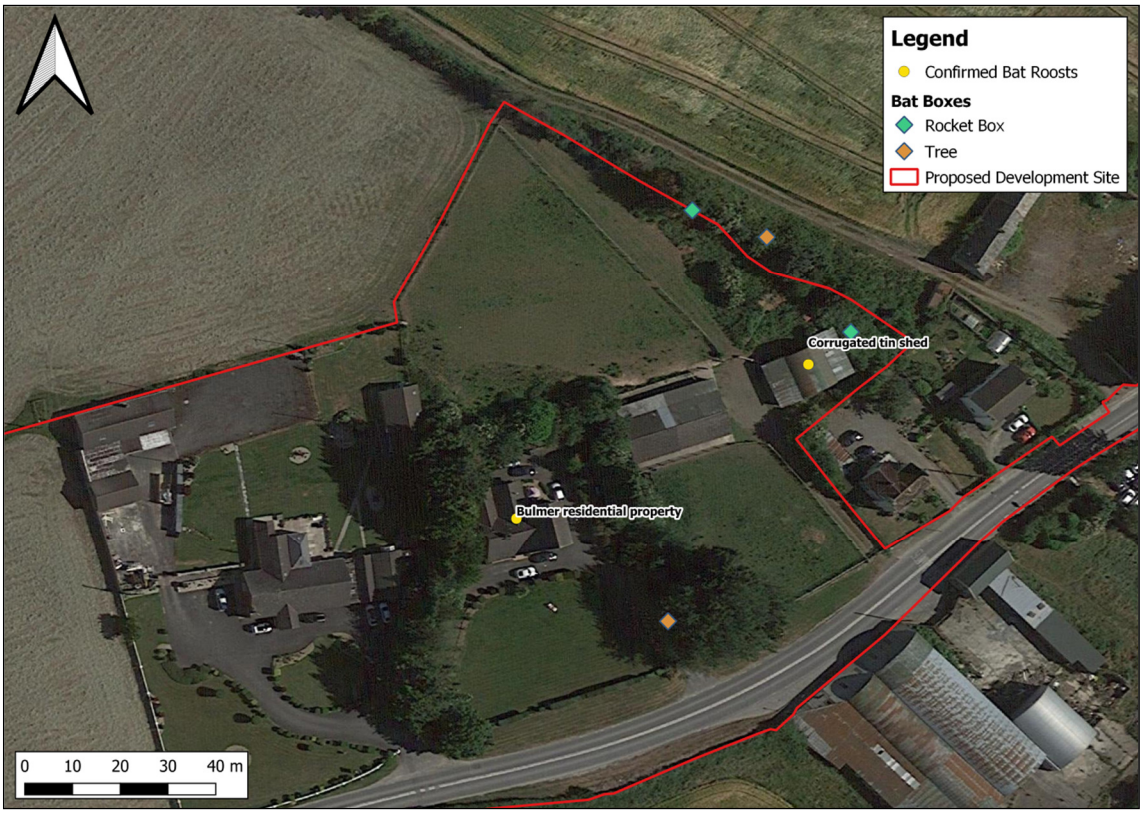

Figure 6.16 Locations of suggested bat boxes on retained trees and rocket boxes in retained hedgerow within the Proposed Development site (indicative site boundary)

- **Lighting proposals for the operational phase:** Lighting proposals for the operational phase will adhere to the following guidance:
  - *Bats & Lighting: Guidance Notes for Planners, engineers, architects and developers* (Bat Conservation Trust, 2010);
  - *Guidance Notes for the Reduction of Obtrusive Light GN01 (Institute of Lighting Professionals, 2020); and*
  - *Bats and Lighting in the UK – Bats and the Built Environment Series (Bat Conservation Trust UK, January 2018).*
- Operational stage lighting details shall be reviewed by a qualified bat ecologist. Any external lighting system for the Proposed Development will be designed to minimise glare and light spillage to surrounding agricultural lands and linear treelines and hedgerows. All external lighting will be of a type that ensures deflection of lighting downwards. If necessary, the bat ecologist shall recommend adjustments to directional lighting (*e.g.* through cowls, shields or louvres) to restrict light to those areas where it is needed, importantly along linear habitat features to ensure long-term suitability for foraging and commuting bats.

Significance of Residual Effects

6.134 With the full and successful implementation of the mitigation measures outlined above, no residual impacts are predicted on foraging/commuting bats at any geographical scale.

Small Mammals

Potential Impacts

6.135 The grassland, scrub, immature woodland, hedgerow and treeline habitats on the Proposed Development site are likely to support small mammal species such as pygmy shrew and hedgehog. Given that no individuals were observed on site, it is anticipated that relatively low numbers of individuals of each species are likely to be present and may be affected. They are highly mobile species, and it is likely that any individuals present will take refuge in the retained scrub, immature woodland and hedgerow habitats. It is not proposed to remove any area of scrub, immature woodland, hedgerow habitat as part of the Proposed Development. Displacement of small mammals arising from the loss of grassland habitat are expected to disperse into the adjacent agricultural land which surrounds the Proposed Development site. Considering this, construction at the Proposed Development is not likely to result in injury or mortality that would affect the species' conservation status, and therefore would not result in a significant negative effect, even at a local geographic scale.

6.136 In conjunction with any temporary displacement effects associated with increased human presence and/or noise and vibration associated with proposed works, the proposed works have the potential to displace mammal species from both breeding/resting places and from foraging habitat. However, given the temporary nature of the disturbance, the fact that all scrub, immature woodland and hedgerow habitats are to be retained as part of the Proposed Development, and the relatively low number of individuals the habitat is likely to support, it is extremely unlikely to even result in any short-term effects on the local mammal population or their conservation status. Therefore, disturbance/displacement during construction is unlikely to result in a significant negative effect, at any geographic scale.

Mitigation Measures

6.137 There are no significant effects predicted on small mammal species as a result of the proposed works, and therefore no mitigation measures are required.

Significance of Residual Effects

6.138 No significant residual effects on small mammal species are predicted as a result of the proposed works.

Amphibians

Potential Impacts

6.139 Amphibian species such as smooth newt and common frog are protected under the Wildlife Acts 1976-2019. Common frog is also listed under Annex V of the Habitats Directive.

6.140 During construction, contaminated surface water runoff and/or an accidental spillage or pollution event into any surface water feature has the potential to have a significant negative impact on water quality and consequently an impact on amphibian species; either directly (e.g. species coming into direct contact with pollutants) or indirectly (e.g. acute or sub-lethal toxicity from pollutants affecting their food supply or supporting habitats).

6.141 However, it is considered unlikely that a pollution event of such a magnitude would occur during construction or be any more than temporary in nature. Nevertheless, a precautionary approach is being taken in assuming a level of risk of water quality impacts and detailed mitigation measures are required to further minimise the risk of the Proposed Development having any perceptible effect on water quality during construction.

6.142 Habitat degradation as a result of effects on surface water quality during construction has the potential to affect the species' conservation status and result in a likely significant negative effect, at a local geographic scale.

6.143 Mitigation measures have been designed to protect water quality during construction and are outlined as per earlier in this chapter in terms of mitigation measures for National and European sites.

Breeding Birds

Potential Impacts

6.144 Bird species are protected under the Wildlife Acts 1976-2019 and it is an offence to disturb birds while on their nests, or to wilfully take, remove, destroy, injure, or mutilate their eggs or nests. In the absence of adoption of measures for the protection of birds and their nests, there is potential for direct impacts on nesting birds and/or mortality of birds arising from the clearance of vegetation within the Proposed Development site.

6.145 Vegetation removal required to facilitate the construction of the Proposed Development comprises largely habitat loss of agricultural grassland (GA1) and buildings and artificial surfaces (BL3) habitats. There are also proposals to remove two treelines and six individual trees from the hedgerow along the eastern boundary of the proposed substation site to the north of Peamount Road (R120). Loss of foraging/nesting habitat for breeding birds during the construction phase of the proposed development is not significant at any geographic scale, given the areas of retained periphery hedgerows and the suitability of the surrounding habitats beyond the Proposed Development site for foraging/nesting birds.

6.146 It is possible that birds currently using habitats within the Proposed Development site and its environs may be temporarily disturbed as a consequence of increased noise and human activity levels during the construction phase of the Proposed Development. This disturbance could potentially result in the temporary displacement of birds within the construction zone and in adjacent hedgerow and treeline habitats. As a result, a potential reduction in the breeding success of affected birds is expected during this period. Although construction phase impacts on breeding birds are considered to be temporary in nature, impacts are potentially significant at a local geographical scale.

6.147 The operational phase of the Proposed Development will require minimal human activity at the proposed substation, therefore disturbance is not expected during this phase. This impact is considered to be temporary and restricted to the construction phase of the development and post-construction until birds in the locality habituate to the Proposed Development.

6.148 Overall the development is not predicted to result in a significant impact on breeding birds during operation at any geographic scale.

Mitigation Measures

6.149 The following mitigation measures are proposed to comply with legislation protecting birds and their nests:

- In order to avoid disturbance of breeding birds, their nests, eggs and/or their unfledged young, all works involving any vegetation clearance will be undertaken outside of the nesting season (1st March to 31st August inclusive).

Or where this seasonal restriction cannot be observed then:

- A breeding bird survey will be undertaken, prior to works commencing, during the appropriate survey season (between early March and late June) by an ecologist with experience undertaking breeding bird surveys in order to confirm whether birds are nesting within suitable habitat affected by or immediately adjacent to the Proposed Development lands. Prior to any vegetation clearance during the nesting season (1st March to 31st August inclusive) a check of vegetation for nesting birds must be undertaken. If no breeding birds are found nesting in trees or hedgerows on the site, this vegetation must be removed within 48 hours or repeat surveys will be necessary. Should nesting birds be present during surveys, the removal of trees or hedgerows may be required to be delayed until after the nesting season (1st March to 31st August inclusive).

6.150 The following mitigation measures are proposed to enhance habitat suitability for breeding birds within the Proposed Development:

- The planting of bird friendly plants, specifically trees and shrubs with berries suitable for foraging local bird species (see Appendix 6.6)

- The installation of bird boxes within the new native woodland belt surrounding the development and within native trees planting in the wetland areas in the south of the site.

Significance of Residual Effects

6.151 Residual impacts on breeding birds include temporary displacement from the Proposed Development site during the construction phase and in particular vegetation clearance, albeit over a small scale. However, with the full and successful implementation of the mitigation measures, no long-term significant impacts are predicted on breeding birds at any geographical scale.

Development Plan Objectives

6.152 The local authority for this Proposed Development is South Dublin County Council. Plans and developments within South Dublin must comply with the policies and objectives of the South Dublin County Council Development Plan 2016-2022 (South Dublin County Council, 2016), including the plans objectives for biodiversity and green infrastructure, which apply to ecological features within the lands.

Cumulative Impacts

6.153 The surrounding lands to the east are largely zoned as 'EE- Enterprise and Employment' in the South Dublin County Council Development Plan 2016-2022 (South Dublin County Council, 2016). There are numerous granted planning permissions for industrial developments in the vicinity of the Proposed Development site which are likely to be in construction at the same time as the Proposed Development. In this case, there is potential for cumulative impacts to arise, as a consequence of the Proposed Development acting in-combination with other plans and projects, on water quality in the downstream surface water environment and on disturbance to birds and bats. It is considered that these potential cumulative impacts would be temporary and could occur at a local geographical scale, in the absence of mitigation.

6.154 There is also potential for cumulative impacts on local bird and bat populations in the area to arise as a result of habitat loss and habitat fragmentation, if areas of treeline, hedgerow and woodland are replaced by areas of hard standing or buildings and artificial surfaces. However, there is minimal vegetation clearance of trees and treelines proposed as part of the Proposed Development and there is substantial landscape planting proposed for the site. Additionally, there is suitable habitat available in the immediate vicinity of the Proposed Development site such as the surrounding farmland to the north, west and south and Newcastle Golf Centre. These lands won't be developed under the current development plan. Therefore, no cumulative effects are predicated as a result of habitat loss and habitat fragmentation, in conjunction with the proposed development. Potential cumulative impacts on local bat populations are also possible as a result of habitat loss associated with the removal of buildings at the Proposed Development site. Two known bat roosts, used by individual soprano pipistrelle bats, will be removed as a result of the Proposed Development site. In addition, the Little Acre residential building and associated outbuildings are permitted for demolition under SDCC Reg. Ref. SD20A/0058. Therefore, the cumulative effect of these two applications will result in a reduction of potential roosting opportunities to local bats. Considering the surrounding habitats and the fact that the two known roosts proposed for demolition under this application are known to support single soprano pipistrelle bats, this cumulative effect is not considered to be significant at any geographic scale.

6.155 There is potential for "in-combination" effects on water quality in Dublin Bay from any other projects carried out within the functional areas of the South Dublin County Council Development Plan 2016-2022 (South Dublin County Council, 2016), Dublin City Development Plan 2016-2022 (Dublin City Council, 2016), the Dún Laoghaire-Rathdown County Development Plan 2016-2022 (Dún Laoghaire-Rathdown County Council, 2016), the Fingal Development Plan 2017-2023 (Fingal County Council, 2017), or any other county level land use plans which can influence conditions in Dublin Bay via rivers and other surface water features. As noted within the AA Screening report accompanying this report (Scott Cawley, 2021), Dublin Bay is currently unpolluted and the Proposed Development will not result in any measurable effect on water quality in Dublin Bay. There are also protective policies and objectives in place at a strategic planning level to protect water quality in Dublin Bay. Therefore, there is no possibility of any other plans or projects acting in combination with the Proposed Development to undermine the conservation objectives of any of the qualifying interests or special conservation interests of the European or nationally designated sites in, or associated with, Dublin Bay as a result of water quality effects.

Conclusion

6.156 The assessment presented in the AA Screening Report concluded that the Proposed Development poses no risk of likely significant effects on any European sites, either alone or in combination with any other plans or projects. The Proposed Development will also not result in any significant effects on any nationally designated sites for nature conservation (i.e. pNHA or NHA sites).

6.157 The Proposed Development will not result in significant effects on the local bat or breeding bird populations. Nevertheless, due to the legal protection afforded to bats and breeding birds, mitigation measures are proposed to minimise the effects of site clearance, construction works and operational disturbance on these species.

6.158 The Proposed Development will result in minor habitat loss of KER habitats within the Proposed Development boundary. There are no proposals to remove any hedgerows as a result of the proposed development, although two treelines and six individual trees contained within the eastern hedgerow will be removed. Mitigation measures are proposed to avoid or minimise damage to trees and hedgerows to be retained within the Proposed Development site. Additionally, the extensive planting of native trees, wildflower meadow and woodland understorey as part of the proposed development will enhance the biodiversity of the area in the medium to long-term. In addition, mitigation measures have been proposed to prevent any accidental pollution event into surface waters in the vicinity of the proposed development site which could have negative impacts on amphibians, if present.

7. LAND, SOIL, GEOLOGY AND HYDROGEOLOGY

7.1 This chapter assesses and evaluates the potential impacts of the proposed development described in Chapter 2 (Description of the Proposed Development) on the land, soils, geological and hydrogeological environment. The impact on hydrology is addressed in Chapter 8. Chapter 15 Material Assets addresses the impacts on water supply, wastewater, and stormwater drainage.

Methodology

7.2 The duration of each effect is considered to be either momentary, brief, temporary, short-term, medium-term, long-term, or permanent. Momentary effects are considered to be those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects are considered to be those which are construction related and last less than one year. Short term effects are seen as effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years. This is based on the Institute of Geologists of Ireland (IGI) '*Guidelines for the preparation of Soils Geology and Hydrogeology Chapters of Environmental Impact Statements*' (2013).

7.3 The rating of potential environmental effects on the land, soil, geological and hydrogeological environment is based on the matrix presented in Environmental Protection Agency Guidelines on The Information to Be Contained In Environmental Impact Assessment Reports 2017 which takes account of the quality, significance, duration and type of effect characteristic identified (in accordance with impact assessment criteria provided in the Draft EPA Guidelines (2017) publication).

7.4 The TII criteria for rating the magnitude and significance of impacts on the geologically related attributes and the importance of hydrogeological attributes at the site during the EIA stage are also relevant in assessing the impact and are presented in Table 1 in Appendix 7.1.

Guidelines

7.5 This assessment has been carried out generally in accordance with the following guidelines:

- Environmental Protection Agency (EPA), Advice Notes for Preparing Environmental Impact Statements Draft (September 2015)
- Environmental Protection Agency Guidelines on The Information to Be Contained In Environmental Impact Assessment Reports 2017;
- Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report, European Union 2017;
- Institute of Geologists of Ireland (IGI) '*Guidelines for the preparation of Soils Geology and Hydrogeology Chapters of Environmental Impact Statements*' (2013); and
- Transport Infrastructure Ireland (TII) '*Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for Transport Infrastructure Ireland'* (2009).

7.6 The principal attributes (and impacts) to be assessed include the following:

- Geological heritage sites in the vicinity of the perimeter of the proposed development;
- Landfills, industrial sites in the vicinity of the proposed development and the potential risk of encountering contaminated ground;
- The quality, drainage characteristics and range of agricultural uses of soil around the proposed development;
- Quarries or mines in the vicinity, the potential implications (if any) for existing activities and extractable reserves;
- The extent of topsoil and subsoil cover and the potential use of this material on site as well as requirement to remove it off-site as waste for recovery or disposal;
- High-yielding water supply springs/wells in the vicinity to within a 2km radius and the potential for increased risk presented by the proposed development;
- Classification (regionally important, locally important etc.) and extent of aquifers underlying the perimeter area and increased risks presented to them by the proposed development associated with aspects such, as for example, removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes, change in groundwater quality;

- Natural hydrogeological/ karst features in the area and potential for increased risk presented by the activities at the site;
- Groundwater-fed ecosystems and the increased risk presented by operations both spatially and temporally; and
- Vulnerability of the proposed development to major disasters from a geological and hydrogeological standpoint such as landslides and seismic activity.

Sources of Information

7.7 Desk-based geological and hydrogeological information on the substrata underlying the extent of the proposed development and surrounding areas was obtained through accessing databases and other archives where available. Data was sourced from the following:

- Geological Survey of Ireland (GSI) - online mapping, Geo-hazard Database, Geological Heritage Sites & Sites of Special Scientific Interest, Bedrock Memoirs and 1:100,000 mapping;
- Teagasc soil and subsoil database;
- Ordnance Survey Ireland - aerial photographs and historical mapping;
- Environmental Protection Agency (EPA) – website mapping and database information;
- National Parks and Wildlife Services (NPWS) – Protected Site Register;
- South Dublin County Council- illegal landfill information; and
- Research papers referred to in this chapter.

7.8 Site specific data was derived from the following sources:

- Report and factual data provided by Ground Investigation Ireland (GII) –Site Investigations, Catherinstown House, Newcastle, Co. Dublin. Project no. 10109-10-20. October & November 2020. Data enclosed in Appendix 7.2 to 7.4 of this EIA Report.
- Data provided by Site Investigations Ireland (SII) – Grange Castle West Access Road Site Investigations, Newcastle, Co. Dublin. Project no. 5624:03/03. September 2019. Data enclosed in Appendix 7.2 (BH40, BH41 & TP31 logs, only) of this EIA Report.
- Various design site plans and drawings; and
- Consultation with civil engineers, J.B. Barry and Partners Limited.

Receiving environment

7.9 The receiving environment is discussed in terms of land geology, soils, hydrogeology and site history including potential for existing and historical contamination. The proposed development is located on existing agricultural lands and within infrastructure lands in Milltown, Co. Dublin. It is proposed that the GIS substation and 110kV Transmission line will be constructed alongside a power generation facility (SDCC Reg. Ref. SD20A/0058) and proposed ICT Facility (SDCC Reg. Ref. SD20A/0324). Refer to the engineering drawing D40-ARC-SP-00-DR-A-011 attached with this application.

7.10 The site is located close to the Grange Castle Business Park and its future expansion to the west in Clondalkin, Dublin 22. The site is zoned as - EE with the objective "*To provide for enterprise and employment related uses"*. When the development is operational, there will be a loss of agricultural land and two residential properties. There are no proposed discharges to ground and no impact to geological heritage sites.

Topography and setting

7.11 The main site on which the proposed substation is located falls generally from south to north, with topographical levels ranging from c. 78mAOD in the south east to c. 75 mAOD in the north-west of the development boundary. Regionally, topography gently decreases to the north towards the Grand Canal pNHA (proposed National Heritage Area) and River Liffey. The area surrounding the proposed substation location is currently a mix of greenfield and with industrial buildings to the east (forming the Grange Castle Business Park). The site was previously used for agricultural purposes. An assessment of site history using historical maps (OSI, 2021) indicates that the site has been in agricultural use since the earliest mapping available (1837-1842).

7.12 The site is in the River Liffey river catchment and the existing drainage is discussed in Chapter 8 of this EIAR.

Areas of Geological Interest & Historic Land-Use

7.13 The Geological Survey of Ireland (GSI) Public Viewer www.gsi.ie/mapping was reviewed to identify sites of geological heritage for the study area. There are no recorded sites within the development boundary or within the vicinity. A full audit has not yet been completed for the Dublin area by the Geological Survey of Ireland. However, there is no evidence of any site which could be considered suitable for protection under this program nor is there any recorded in the South Dublin County Development Plan 2016-2022. The closest geological heritage site is the Belgard Quarry, which is located c. 3 km south-east of the site.

7.14 The wider site on which the substation is located is bounded by the R120 (Peamount Road) to the south-east by agricultural lands and Newcastle Golf Centre to the west; by agricultural fields and the Lodge Motor Company to the south-west; and by more agricultural lands to the north. The grid connection route will connect the proposed Peamount 110kV GIS Substation to the existing 2 no. single 110kV underground circuits within the Castlebaggot-Kilmahud circuit some 550m to the east. The proposed transmission lines cover a distance of approximately 940m within the townlands of Milltown and Clutterland. The route will pass outside of the main site underneath the R120, the former Nangor Road, Griffeen River and the newly realigned Baldonnel Road.

7.15 The proposed development includes the construction of a two-storey substation, transmission line connection and all associated ancillary elements as descripted in Chapter 2 of this EIA Report. According to the EPA (2021), there are a number of licensed Integrated Pollution Prevention and Control (IPPC) and waste facilities in the vicinity, but these are located over c. 1 km away and downgradient from the site. Consultation with South Dublin County Council confirmed that there are no known illegal/historic landfills within 500 meters of the site.

Regional Soils

7.16 Figure 7.1 below shows the regional soil coverage in the area of the proposed development site. The GSI/ Tegasc mapping shows that the soil type beneath the local area is composed of BminPD, mainly basic poorly drained soils and BMinDW mainly basic deep well-drained soils.

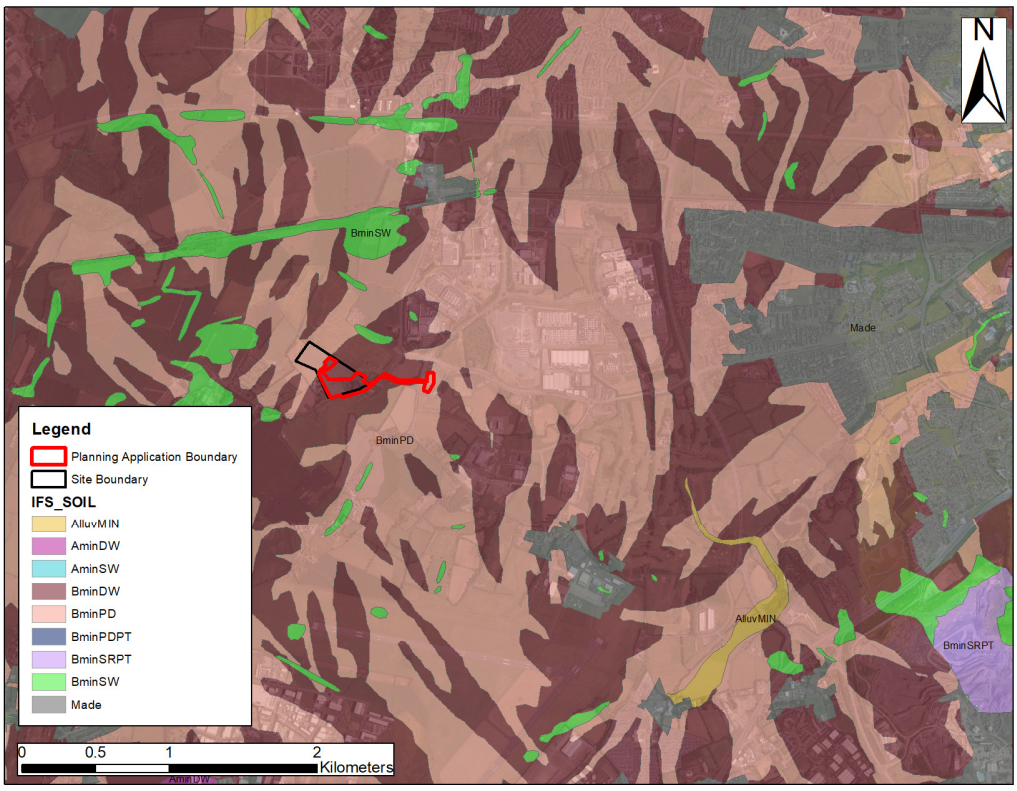

Figure 7.1 Soils map for the proposed development site (boundary indicated in red) (GSI/Tegasc, 2021)

7.17 The Quaternary geological period extends from about 1.5 million years ago to the present day and can be sub-divided into the Pleistocene Epoch, which covers the Ice Age period and which extended up to 10,000 years ago, and the Holocene Epoch, which extends from that time to the present day.

7.18 The GSI subsoil mapping database of the quaternary sediments in the area of the subject site indicates two principal soil types, as shown in Figure 7.2 below. These comprise Quaternary Glacial Till (TLs) and Rck – bedrock close to or at the surface. The Glacial Till is derived from limestone and is a common soil cover in this region.

Figure 7.2 Subsoils map for the proposed development site (boundary indicated in red) (GSI, 2021)

7.19 The following ground conditions were encountered in the site-specific investigations undertaken by GII (Ground Investigation Ireland) on the substation and part of the transmission line site (October to November 2020). Eleven (11) no. trial pits were excavated to a maximum depth of c.1.60m. Four (4) no. groundwater monitoring wells were installed as part of these investigations. Eight (8) no. representative soil samples were also recovered from a number of the pits for laboratory analysis (Figure 7.3 shows the borehole/trial pit locations).

7.20 A second site investigation close and to the immediate north of this part of the proposed development site was undertaken by Site Investigations Ireland Limited as part of an infrastructure project – Grange Castle West Access Road. Two (2) no. boreholes (BH40 & BH41) and one (1) no. trial pit (TP31) are located along the route of the two (2) no. 110 kV transmission lines, refer to Figure 7.4, below. Trial pit logs are included in Appendix 7.2.

7.21 The proposed development of the substation site is underlain by c. 0.2 metres of topsoil. This is underlain by natural firm to soft brown slightly sandy slightly gravelly CLAY. This layer is underlain by brown/ grey coarse GRAVEL. No groundwater was encountered during the site investigations. Trial pits stopped at a shallow depth due to possible bedrock. Trial pit logs are included in Appendix 7.2.

7.22 The proposed route of the transmission line is underlain by topsoil and made ground / tarmacadam. Topsoil indicates the undisturbed soil in the Grangecastle area while the made ground indicates areas such as walkways and roadways. These upper units are underlain by natural firm to stiff brown slightly sandy slightly gravelly CLAY. This CLAY extends to c. 3.20m bgl. This depth is the extent of the site investigations. No groundwater was encountered during the site investigations. Trial pits stopped at a shallow depth due to possible bedrock. Trial pit logs are included in Appendix 7.2.

Figure 7.3 Site Investigation Locations (Source: GII, 2020). Redline boundary refers to the Site Investigation works and not the application redline boundary.

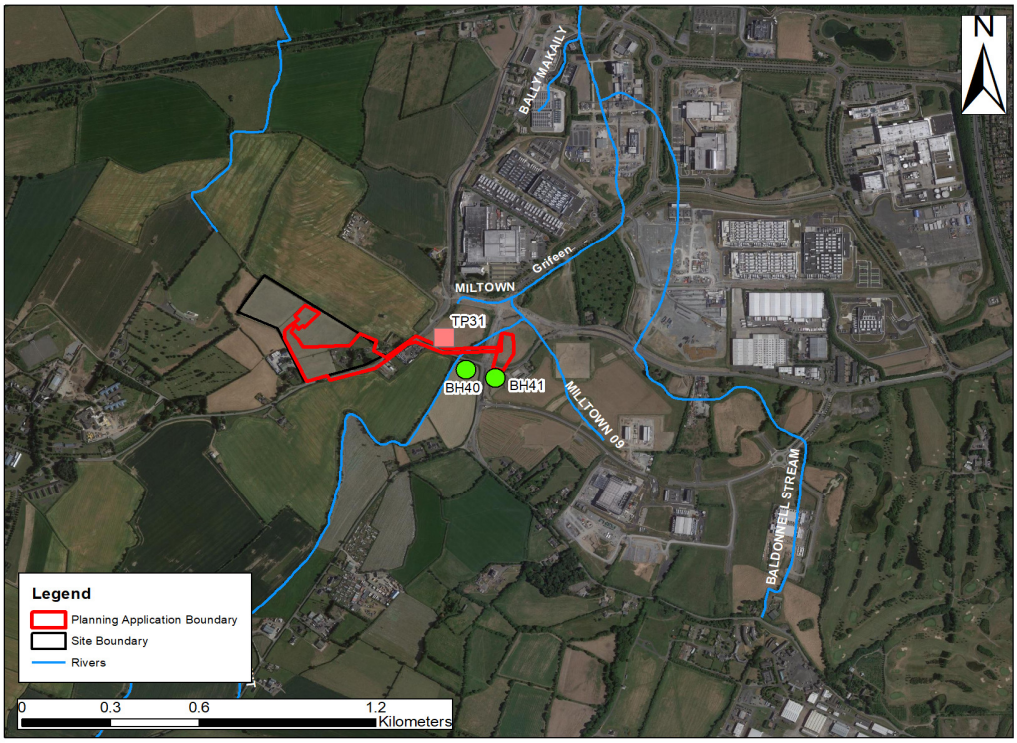

Figure 7.4 Site Investigation Locations (Source: SIL, 2019).

7.23 During the site investigation of the proposed substation site, eight (8) no. soil samples were taken from eleven (11) no. trial pits (TP1, 3, 4, 5, 6, 7, 9 & 10) which were excavated throughout the main site. These soil samples were analysed to confirm the existing soil quality. Samples were analysed for contaminants of concern i.e., mineral oils, Benzene, Toluene Ethyl Benzene and Xylene (BTEX), Poly-aromatic Hydrocarbons (PAHs), Poly- chlorinated Bi-Phenols (PCBs) and Metals. There are no legislative thresholds for soil in Ireland and therefore results were compared with UK CLEA threshold screening values which allow assessment based on health risk and use of the site. LQM (Land Quality Management) and the CIEH (Chartered Institute of Environmental Health) developed a document in July 2009 detailing their own research and derivation of their own 'LQM GACs'. A total of 82 substances including many organic substances had LQM GACs derived, for the standard land uses of residential, commercial/industrial and allotments. This was updated in 2015 following further research

and the derived results are now called LQM/CIEH Suitable 4 Use Level (S4UL). The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and as transparently - derived and cautious "trigger values" above which further assessment of the risks or remedial action may be needed. For each contaminant S4ULs have been derived for six land use scenarios based on assessing exposure pathways in each planning scenario. In this instance the commercial scenario has been considered. Soil type and soil organic matter (SOM) has an influence on the behaviour of contaminants. S4ULs have been derived for three SOM contents (1%, 2.5% and 6%) to cover the likely range in soils. A prudent approach has been taken by considering the lower 1% SOM content. A review of all soil quality results, indicates that there is no contamination across the site and that the site is suitable for this development. These results confirm that the soil is classified as '*inert'* for residential threshold concentrations which was used as a conservative measure. Soil laboratory results are presented in Appendix 7.3 below.

Regional Geology

7.24 Inspection of available GSI records (2021) show that the bedrock geology underlying the site and surrounding area is dominated by rocks of Carboniferous Age. The site and local area are underlain by the Lucan formation, also called the Dinantian (Upper Impure) Limestones or 'Calp' limestone that is dark grey to black limestone and shale (Figure 7.5 below).

7.25 No bedrock outcrops were encountered during the site investigations or are recorded by the GSI within the red line of the proposed development. However, bedrock outcrops occur at several locations within this region as illustrated in Figure 7.2, above. The GSI database presently lists no karst features in the immediate vicinity of the subject site and significant karstification would not be expected in this type of limestone.

7.26 In terms of the structural relationship of the area, the GSI (2021) bedrock geology map (100K structural database) shows some fault lines to the south and east of the subject site.

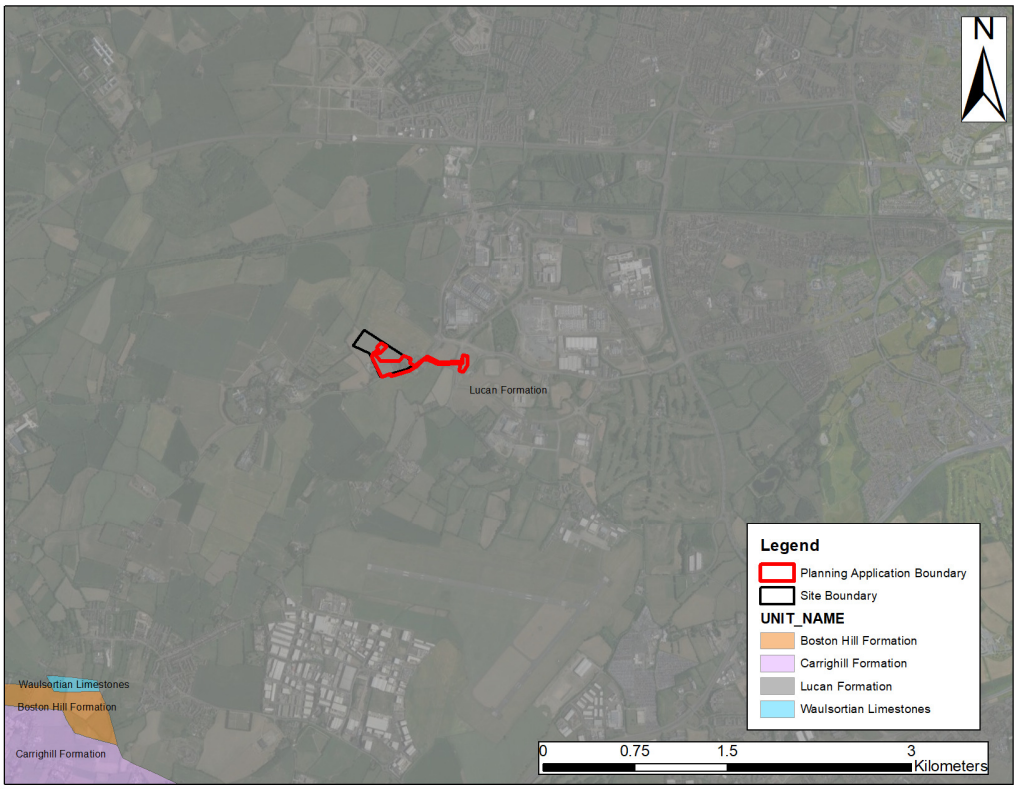

Figure 7.5 Bedrock geology map (planning application boundary indicated in red) (GSI, 2021)

Regional Hydrogeology

Description of the Groundwater Body

7.27 The GSI has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the area extent of the aquifer (km^2), well

yield (m^3/d), specific capacity ($m^3/d/m$) and groundwater transmissivity (mm^3/d). There are three main classifications: regionally important, locally important and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (Ll). Similarly, poor aquifers are classed as either generally unproductive except for local zones (Pl) or generally unproductive (Pu).

7.28 The bedrock aquifers underlying the proposed development site according to the GSI National Draft Bedrock Aquifer Map are classified as Dinantian Limestones (Calp). The GSI has classified this aquifer as Locally Important (Ll) i.e., an aquifer which is moderately productive only in local zones. Figure 7.6 presents the bedrock aquifer map for the proposed development area.

Figure 7.6 Aquifer Classification map (GSI, 2021)

7.29 Aquifer vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures/ fractures, the main feature that protects groundwater from contamination, and therefore the most important feature in the protection of groundwater, is the subsoil (which can consist of peat, sand, gravel, glacial till, clays or silts).

7.30 The GSI currently classifies the aquifer vulnerability in the region of the proposed development site and proposed route as 'Extreme' (E). Extreme vulnerability indicates an overburden depth of 0-3m is present. Site investigations assumed that there was bedrock present and the depth to rock was confirmed at ranged between 1.0 to 1.6 m BGL. This can be seen in Figure 7.7 below.

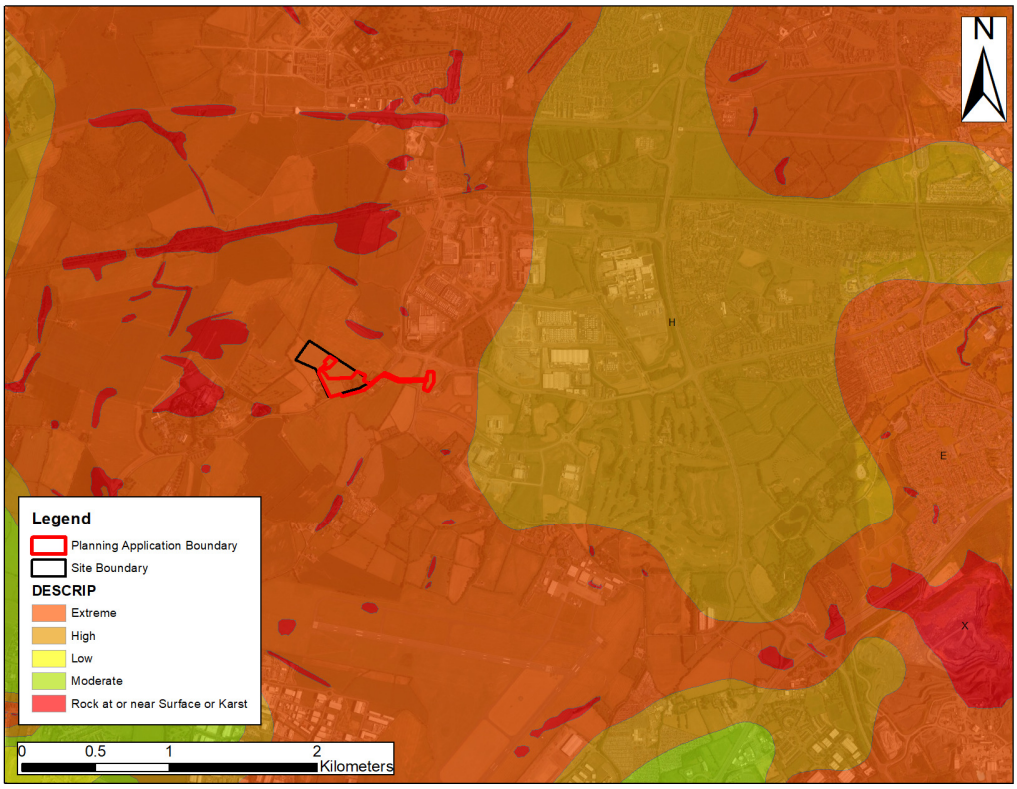

Figure 7.7 Aquifer Vulnerability map (GSI, 2021)

Groundwater Wells and Flow Direction

7.31 The GSI Well Card Index is a record of wells drilled in Ireland, water supply and site investigation boreholes. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in the Republic of Ireland. This current index does not show any wells drilled or springs at the site or surrounding area with the nearest recorded wells located over 3 km to the west and east of the site. The area is serviced by public mains therefore it is unlikely that any wells are used for potable supply. The site is not located near any public groundwater supplies or group schemes. There are no groundwater source protection zones in the immediate vicinity of the site.

7.32 Figure 7.8 (next page) presents the GSI well search for the area surrounding the site (note this source does not include all wells) and Table 7.1 below summarises the details of wells recorded within this search area.

Table 7.1 GSI Well Index Table from well search (GSI, 2021) – Some data is not available

GSI Name	Type	Depth to Bedrock	Townland	County	Use	Yield Class	Yield m3/d
2923SEW006	Borehole	3	Clondalkin	Dublin	Industrial	Good	157.1
2923SEW005	Borehole	1.2	Clondalkin	Dublin	Industrial	Good	185
2923SEW018	Borehole	6.3	Wilkinstown	Dublin	Industrial	Excellent	480
2923EW041	Spring		Bridswell Commor	Dublin			
2923SEW025	Borehole	7	Fox and Geese	Dublin	Industrial	Good	384
2923WW207	Borehole	1.5	Lucan	Dublin	Unknown	Poor	35
2921NEW002	Borehole	2.1	Cheeverstown	Dublin	Unknown	Good	109.1
2921NEW003	Borehole		Belgard	Dublin	Industrial	Excellent	654
2921NWW007	Spring		Rathcole	Dublin			
2921NWW004	Borehole	0.9	Highdownhill	Dublin	Domestic		
2921NWW130	Borehole	6	Lyons Demesne	Dublin	Unknown	Good	390
2921NWW128	Borehole	30	Lyons Demesne	Dublin	Unknown	Poor	10
2921NWW129	Borehole		Lyons Demesne	Dublin	Unknown	Moderate	75
2923SWW205	Spring		Loughtown Lower	Dublin			
2923SW196	Borehole	1.2	Loughlinstown	Dublin	Other		
2923SWW129	Borehole	3.1	Stacumny	Dublin	Unknown	Good	218.2
2923SWW202	Borehole	2	Backstown	Dublin	Other	Poor	17.5
2923SWW203	Borehole	3	Backstown	Dublin	Other		
2923SWW204	Borehole	3	Backstown	Dublin	Other	Poor	39.9
2923SWW133	Borehole	2.5	Castletown	Dublin	Other		
2923SWW134	Borehole	3.5	Castletown	Dublin	Other		
2923SWW135	Borehole	2.2	Castletown	Dublin	Other		
2923SWW136	Borehole	3.9	Castletown	Dublin	Other		

Figure 7.8 GSI Well Search (GSI, 2021)

7.33 Based on a regional topography, groundwater flows are assumed to be in a north-easterly direction towards the Griffeen River and River Liffey.

Groundwater quality

7.34 The European Communities Directive 2000/60/EC established a framework for community action in the field of water policy (commonly known as the Water Framework Directive [WFD]). The WFD required '*Good Water Status'* for all European water by 2015, to be achieved through a system of river basin management planning and extensive monitoring. 'Good status' means both *'Good Ecological Status'* and *'Good Chemical Status'*.

7.35 It is unlikely that there is any groundwater contamination leaching from the soil as there is no evidence of soil contamination based on visual assessment and laboratory analysis. Based on the nature of the surrounding areas (non-industrial) and the lack of soil contamination encountered during onsite investigations it can be inferred that groundwater is of relatively good quality.

7.36 Furthermore, there was four (4) no. groundwater samples taken from the groundwater monitoring wells within the lands proposed for the substation. Borehole logs are presented as Appendix 7.2 attached to this EIA Report.

7.37 The groundwater samples were analysed for the following parameters: dissolved metals, poly aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), polychlorinated biphenyls and inorganics.

7.38 The majority of analytes analysed in the groundwater samples were below the laboratory's limit of detection (LOD). PAHs, VOCs, PCBs, and SVOCs all recorded concentrations below LOD. There were only two parameters that recorded slight exceedances. arsenic and manganese. Groundwater results were compared to the available groundwater regulations S.I. No. 9 of 2010, S.I. No. 366 of 2016 (GTV) and EPA Interim Guideline Values (IGVs), 2003. Laboratory reports are attached as Appendix 7.4 attached to this EIA Report.

7.39 Arsenic recorded a slight exceedance at MW04 groundwater monitoring location. Arsenic recorded a concentration of 0.0108 mg/L which slightly exceeds the groundwater threshold value (GTV) of 0.0075

mg/L and the EPA IGV concentration of 0.010 mg/L. Manganese recorded exceedances at MW01, MW02 and MW04 groundwater locations. Concentrations ranged from 0.054 mg/L (MW02) to 0.075 mg/L (MW01). These concentrations slightly exceeded the available EPA IGV concentration of 0.05 mg/L. There is no GTV concentration for manganese. Arsenic and manganese exceedances can occur naturally often as a result of sediment within the samples following drilling. The monitoring wells are screened in both overburden and bedrock.

7.40 The Groundwater Body (GWB) underlying the site is the Dublin GWB (EU Groundwater Body Code: IE_EA_G_008). Assessments carried out under the 1st Cycle Water Framework Directive 2013-2018 concluded an overall groundwater status as "*Good*" through the assessment programme. Currently, the Dublin GWB has a WFD risk score of "not at risk" meaning the Dublin GWB is likely to meet its WFD targets. Figure 7.9 shows the current Dublin GWB WFD mapping for the proposed development area.

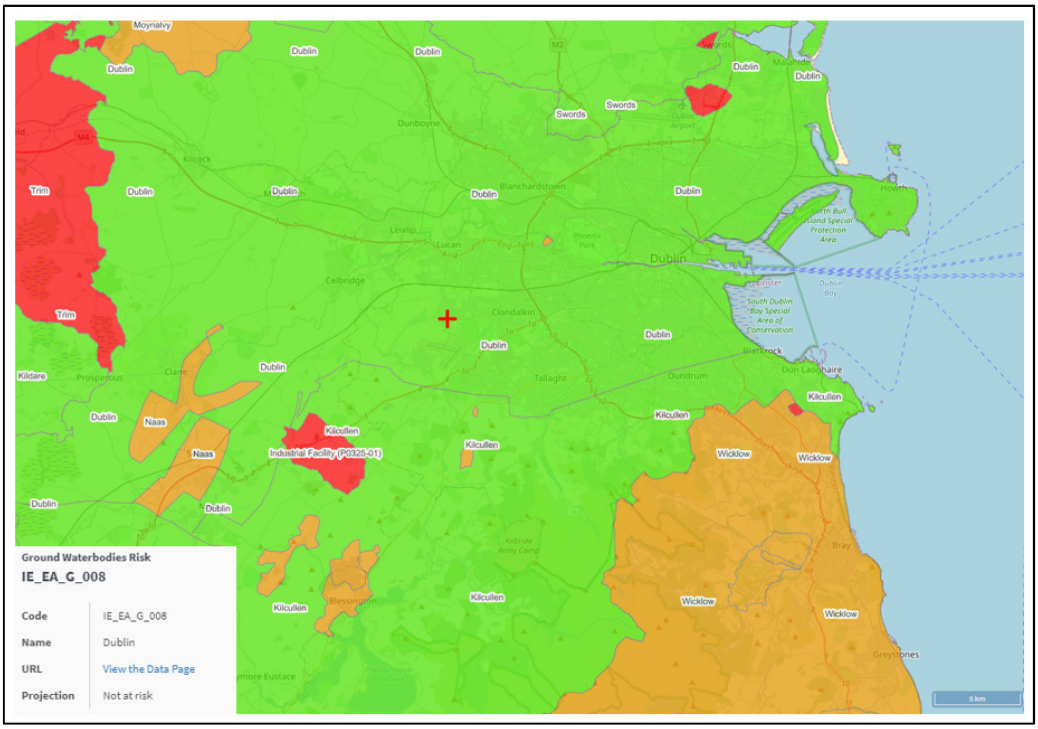

Figure 7.9 Dublin Groundwater Body Current WFD Status "*Not at Risk*" (EPA, 2021). Proposed development area is shown with a red cross.

Hydrogeological features

7.41 There is no evidence of springs or karstification in this area according to the GSI Karst database (2021).

Areas of Conservation

7.42 There are no Special Protection Areas, candidate Special Areas of Conservation or proposed Natural Heritage Areas within or immediately adjacent to the proposed development. The nearest designated site at Grange Castle Business Park is the Grand Canal pNHA (Site Code: 002104) at c. 720 m to the north of the northern boundary of the proposed development, see Figure 7.10, on next page. There is no direct hydrogeological link with the Grand Canal pNHA as it is fully lined.

Figure 7.10 Natura Sites close to the proposed development (NPWS, 2021)

Cross sections: A-A'& B-B'

7.43 Figure 7.11 and 7.12 present the representative cross sections through the site which show the local hydrogeology conceptual site model (CSM). This is described below. It is proposed to drill underneath the Griffeen River. Figure 7.13 presents the alignment of the HDD and the cross section of the alignment underneath the Griffeen River.

- The soil profile on site comprises thin topsoil overlying sandy gravelly CLAY with cobbles and boulders underlain by brown, grey clayey coarse GRAVELS with angular cobbles. The overburden is assumed to be underlain by Limestone (Calp) bedrock.
- Depth to bedrock is assumed to be shallow across the site with no outcrops noted. The section shows bedrock at c. 2.0 mbgl throughout the site although depth to bedrock was not confirmed during the site investigations. It is believed that no bedrock removal will be required as part of the proposed excavations.
- The site falls generally from south to north, with topographical levels ranging from c. 78mAOD in the south east to c. 75 mAOD in the north-west of the proposed development boundary. Regionally, topography gently decreases to the north towards the Grand Canal pNHA (proposed National Heritage Area).
- A continuous water table was not encountered in the any of the exploratory trial pits. Development of the site does not require any basement structure and therefore no significant dewatering of the bedrock aquifer will be required.
- Review of the hydrogeology and geology in the surrounding region indicates that there are no sensitive receptors such as groundwater-fed wetlands, Council Water Supplies/ Group Water Schemes or geological heritage sites which could be impacted by this development.
- No evidence of waste disposal material was identified during the site investigation. Any excavated material would be acceptable at an inert landfill or suitable for re-use as landscaping fill for the final development based on WAC analysis.
- Regional groundwater flows are in a north westerly direction assumed to be towards the Griffeen River and River Liffey to the south west from the proposed site of the substation; however, the potential for any impact on the baseflow in the Griffeen River as a result of the proposed development is low based on the absence of any abstraction /dewatering from the aquifer.
- Horizontal Directional Drilling (HDD) drilling underneath the Griffeen River is required for the installation of the two transmission cables. It is proposed to drill underneath this waterbody through

the Dublin Boulder Clay and underlying Limestone Calp bedrock. A feasibility study was carried out by Geo Drilling Solutions for the HDD beneath the Baldonnell Road & Griffeen River. Refer to the report GD2073 Grange Castle 110kV ESB Trenchless Crossing attached to this application.

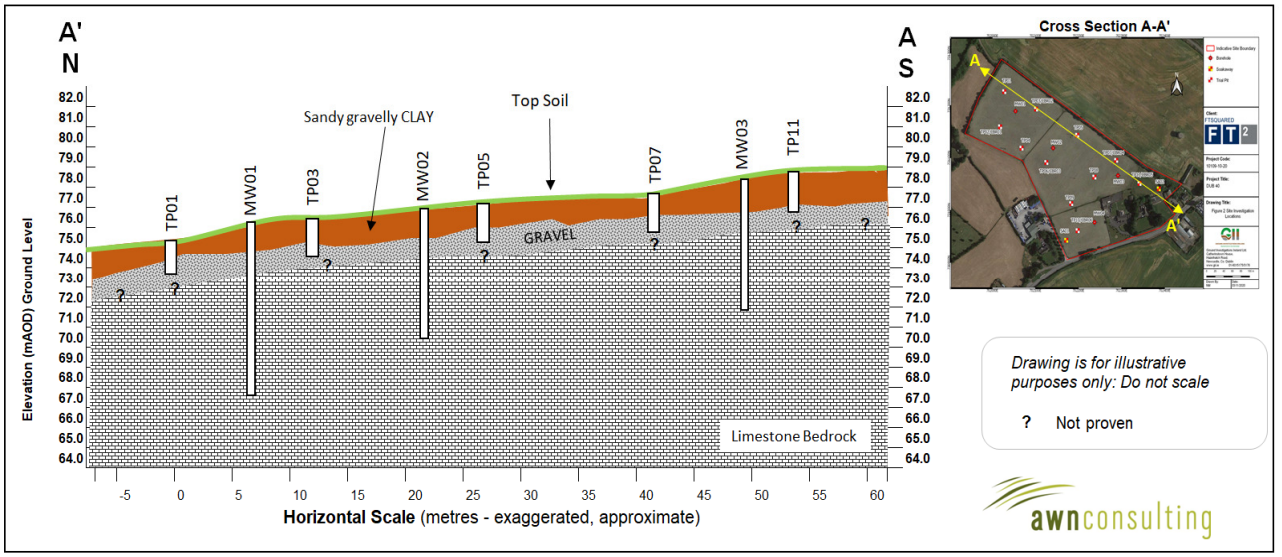

Figure 7.11 A - A' cross section of proposed site.

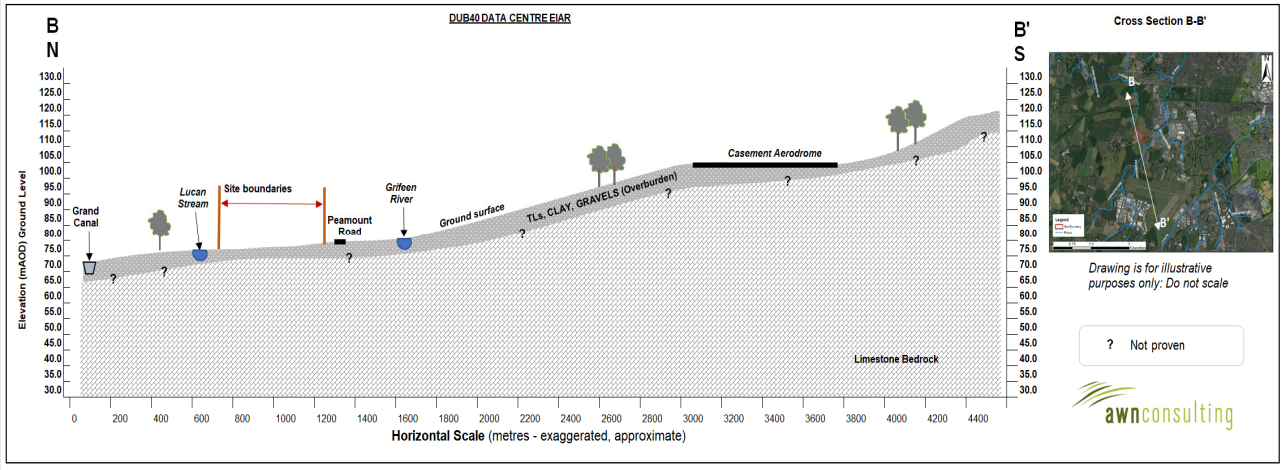

Figure 7.12 B – B' cross section of region located around the proposed site.

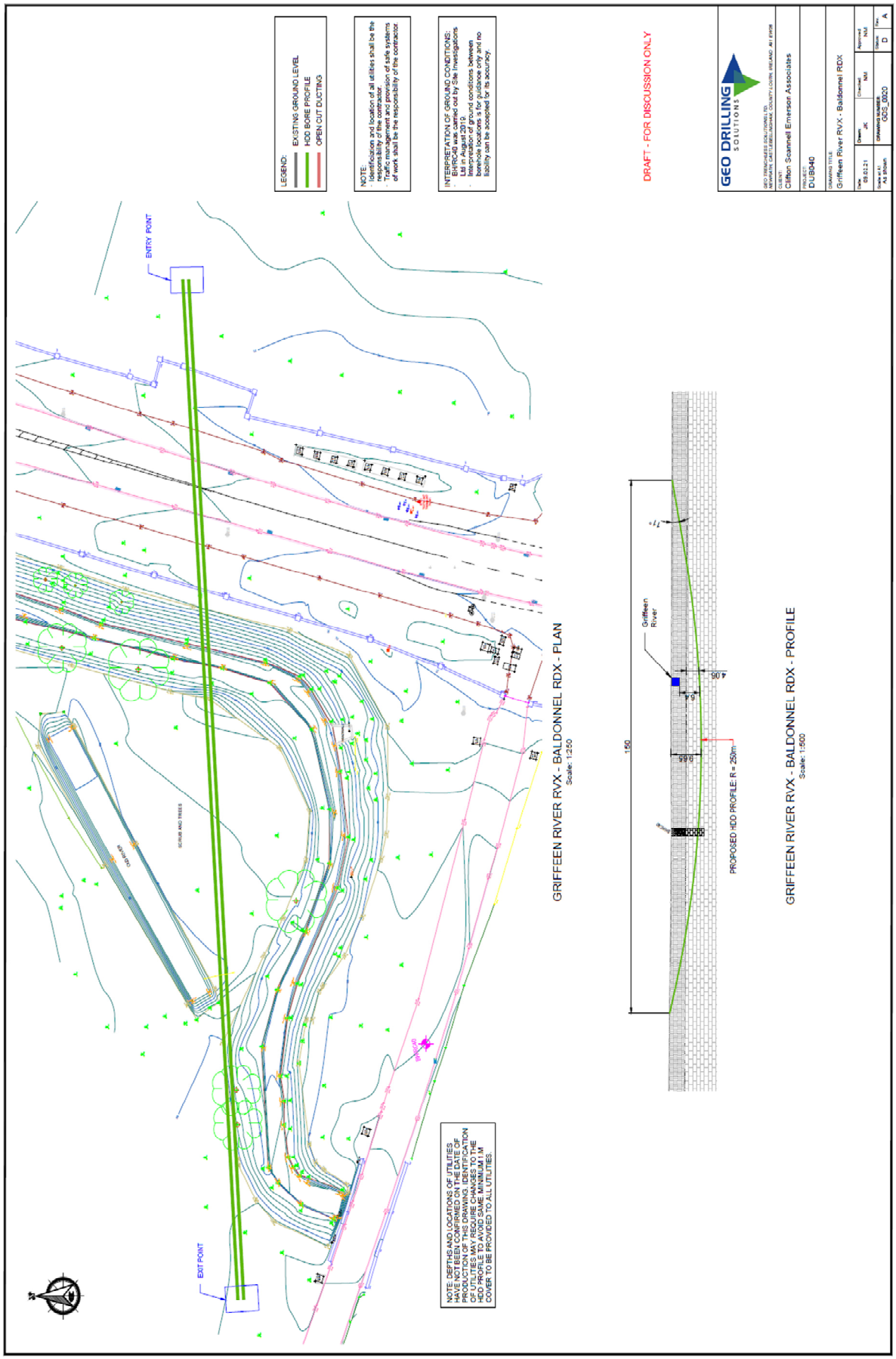

Figure 7.13 Proposed alignment of HDD for the installation of the transmission lines. (Reference - Geo Drilling Solutions report GD2073)

Rating of site importance of the geological and hydrogeological features

7.44 The importance of the hydrogeological features at this site is rated as ***medium importance*** based on the TII methodology refer to Appendix 7.1 below. This rating is based on the assessment that the hydrogeological attribute has a medium-quality significance or value on a local scale. The aquifer is a Locally Important Aquifer but is not widely used for public water supply or generally for potable use.

Economic Geology

7.45 The Extractive Industry Register (www.epa.ie) and the GSI mineral database were consulted to determine whether there were any mineral sites close to the proposed development. There are no active quarries located in the immediate vicinity with the nearest quarry being located c. 4km to the south-east which is classified as the Belgard Quarry. The EPA ENVision (https://gis.epa.ie/EPAMaps/) website also confirmed that there are no mines on or near the site.

Radon

7.46 According to the EPA (now incorporating the Radiological Protection Institute of Ireland) the site location in Grangecastle is a Low Radon Area where is it estimated that between 5% - 10% of dwellings will exceed the Reference Level of 200 Bq/m^3. This is the third-lowest of the five radon categories which are assessed by the EPA.

Geohazards

7.47 Much of the earth's surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating slope failure. Instability is often significantly increased by man's activities in building houses, roads, drainage and agricultural changes. Landslides, mudflows, bog bursts (in Ireland) and debris flows are a result. In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff and leads to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities. The GSI landslide database was consulted and the nearest landslide to the proposed development was c.7.5km to the north, referred to as the Diswellstown event which occurred on 24th December 1999. There have been no recorded landslide events at the site. Due to the local topography and the underlying strata, there is a negligible risk of a landslide event occurring at the site.

7.48 In Ireland, seismic activity is recorded by the Irish National Seismic Network. The Geophysics Section of the School of Cosmic Physics at the Dublin Institute for Advanced Studies (DIAS) has been recording seismic events in Ireland since 1978. The station configuration has varied over the years. However, currently, there are five permanent broadband seismic recording stations in Ireland and operated by DIAS. The seismic data from the stations comes into DIAS in real-time and are studied for local and regional events. Records since 1980 show that the nearest seismic activity to the proposed location was in the Irish sea (1.0 – 2.0 Ml magnitude) and ~55 km to the south in the Wicklow Mountains. There is a very low risk of seismic activity to the proposed development site.

7.49 There are no active volcanoes in Ireland so there is no risk from volcanic activity.

Land take

7.50 There will be a loss of agricultural land due to the proposed development. However, the site is zoned to provide for Enterprise and Employment uses subject to the provision of necessary physical infrastructure.

Summary & Type of Geological/Hydrogeological Environment

7.51 Based on the regional and site-specific information available the type of Geological/ Hydrogeological Environment as per the IGI Guidelines is:

Type B – Naturally Dynamic Hydrogeological Environment.

7.52 A summary of the site geology and hydrogeology is outlined as follows:

- Historically, the proposed development site has been used for residential, greenfield and agricultural use. There is no evidence of any historical waste disposal or contamination present.
- The study area is underlain by a locally important aquifer.
- The study area is underlain by the Lucan formation comprising dark grey to black limestone and shale from the Carboniferous Age.

Characteristics of the Proposed Development

7.53 A detailed description of the proposed development is provided in Chapter 2 of this EIA Report. The proposed development includes the demolition of all existing buildings within the subject site and the construction of the two storey substation, 110kV transmission lines and all associated ancillary elements as descripted in Chapter 2.

7.54 The activities associated with the proposed development which are relevant to the land, soils, geology and hydrogeological environment are detailed in Table 7.2.

Table 7.2 Site Activities Summary

Phase	Activity	Description
Construction	Discharge to Ground	Only stormwater run-off percolating to ground at the construction site.
	Earthworks: Excavation of Superficial Deposits	Cut and fill will be required to facilitate construction, installation of the transmission cable from the Peamount substation to the proposed 110kV Gas Insulated Switchgear (GIS) Substation Compound substation, and ancillary works. The proposed development includes the demolition of all existing buildings within the subject site. Topsoil/subsoil stripping and localised stockpiling of soil will be required for short periods of time during construction. The optimum depth of excavation of the trenches required to facilitate installation of the ducting will typically have an optimum depth of excavation of 1.25m below ground level but may increase to up to c. 3.5m at utility crossings. The typical width of each trench is 0.6m; however, this may vary depending on ground conditions and existing services. It is estimated that approximately 1,556m^3 of subsoils, tarmacadam / hardcore fill will be excavated to facilitate construction of the proposed transmission lines. In addition to the transmission lines, it is estimated that approximately 24,700m^3 of topsoil and subsoils will be excavated for the substation, attenuation, and landscaping component of the proposed development. Suitable soils and stones will be reused on-site as backfill in the grassed areas, where possible. It is currently envisaged that all of the excavated material will be reused for a landscaping on site, and will require an additional import of c. 22,000m^3 of soil to complete the landscaping aspects.
	Horizontal Directional Drilling	Horizontal Directional Drilling (HDD) drilling underneath the Griffeen River is required for the installation of the two transmission cables. It is proposed to drill underneath this waterbody through the Dublin Boulder Clay and underlying Limestone Calp bedrock. A feasibility study was carried out by Geo Drilling Solutions for the HDD beneath the Baldonnel Road & Griffeen River. Refer to the report GD2073 Grange Castle 110kV ESB Trenchless Crossing attached to this application. It is proposed that the drilling route will be approx. 7 metres below the Griffeen River. The HDD process will not impact on the flow of the river or the integrity of the river. This is further discussed in Chapter 8 – Hydrology.
	Storage of hazardous Material	Fuel for construction vehicles will be stored in the already approved contractors' compound at the development site during construction phase.
	Import/Export of Materials	It is envisaged that all excavated material will be removed as a waste off site. Any material re-used offsite for beneficial use on other sites with appropriate planning/waste permissions/derogations (e.g. in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011) or will be recovered and/or disposed off-site at appropriately authorised waste facilities. The soil removed as part of the transmission lines will be tested prior to disposal. The removal of waste from the site will be carried out in accordance with Waste Regulations, Regional Waste Plan and Waste Hierarchy/Circular Economy Principals. Refer to Chapter 14 Waste Management for further detail. The importation of clean engineered fill will be required to facilitate construction. In the event of any soils/stones being imported onto the site from another construction site as a by-product, this will also be done in accordance with Article 27. (EPA agreement should be obtained before use of soils/stones as a by-product.)
Operation	Increase in hard standing area	Altering of local recharge due to increase in hard standing area.
	Storage of hazardous Material	It is assumed that there will be no bulk storage of any chemicals during the operational phase of this development.

7.55 As outlined in Table 7.2 the activities required for the construction phase of the proposed development represents the greatest risk of potential impact on the geological environment. These activities primarily pertain to the site preparation, excavation, levelling and infilling activities required to facilitate construction of the proposed development.

Potential impacts of the Proposed Development

7.56 An analysis of the potential impacts of the proposed development on the land, soils, geology and hydrogeological environment during the construction and operation is outlined below. Due to the inter-relationship between soils, geology and hydrogeology and surface water (hydrology) the following impacts discussed will be considered applicable to both Chapter 7 and 8 of the EIA Report. Remediation and mitigation measures included in the design of this project to address these potential impacts are presented in Sections 7.63 – 7.82.

Construction phase

7.57 The following potential effects to land soil and groundwater have been considered:

- Due to the lack of previous development at the site and the historical residential and agricultural use at the site, the risk of contaminated soils being present onsite is low and this was confirmed by onsite soil sampling and analysis. Nonetheless material, which is exported from site, if not correctly managed or handled, could impact negatively on human beings (onsite and offsite) as well as water and soil environments.
- Excavation of soil will be required for levelling of the site to render it suitable for building the proposed development (proposed two storey substation). Excavation of soil, tarmac and hardcore will be required for the installation of the transmission line. Local removal and reinstatement (including infilling) of the 'protective' topsoil and subsoil cover across the development area at the site will not change the overall vulnerability category for the site which is already 'high to extreme'. Capping of the substation footprint of the site by hardstand/ building following construction and installation of drainage which will minimise the potential for contamination of the aquifer beneath the site: The Locally Important Bedrock Aquifer (Ll) which is moderately productive in local zones only. Site investigation and laboratory analysis has not identified any existing contamination with hazardous substances. Although, there is no soil quality data obtained along the route of the 110kV transmission lines. No treatment of any water will be required during construction works.
- The excavation of material along the 110kV lines encompass removing material along roadways. It is assumed that the material removed along these roadways is expected to be contaminated. This material will be required to be removed and disposed by a licenced contractor to an appropriate waste facility.
- As with all construction projects there is potential for water (rainfall and/or groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a significant short-term risk to groundwater quality for the duration of the construction if contaminated water is allowed percolate to the aquifer. The potential main contaminants include:
  - Suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates)) – arising from excavation and ground disturbance;
  - Cement/concrete (increase turbidity and pH) – arising from construction materials;
  - Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage;
  - Wastewater (nutrient and microbial rich) – arising from poor on-site toilets and washrooms.

Loss of agricultural land

7.58 There will be a local loss of agricultural soil however, the area of development is small in the context of the overall agricultural land available in the region and has been zoned for enterprise and employment development.

Operational phase

7.59 The following risks have been considered in relation to the operational phase of the development:

- There will be an increase in overall hardstand as a result of the development of c 1,500 m^2. A SuDs design was incorporated in the design for the concurrent data storage facility (SD20A/0324) and power generation application (SD20A/0058). The attenuation network includes the proposed substation development.
- The SuDs design will encourage discharge to ground where feasible using a network of swales, attenuation pond, filter drains, permeable pavement and interceptors. The attenuation and drainage system are presented as part of the planning drawings – J.B Barry Partners 19229-JBB-00-XX-DR-C01503 & -01507. The water services report detailing the SuDs designed is attached to this planning application - 19229-JBB-00-XX-RP-C-00008.
- As part of the SuDs design, there will be an attenuation pond with a storage volume of 2,903m^3. This pond will contain a hydro-brake flow control device with a flow of 56.3 l/sec. Refer to JB Barry Water Services Report attached to this application.
- There is a potential for leaks and spillages from vehicles along access roads and in parking areas. Any accidental emissions of oil, petrol or diesel could cause soil/groundwater contamination if the emissions are unmitigated.
- In the event of a fire at the temporary substation facility, firewater could become contaminated and in the absence of mitigation may contaminate soil and groundwater.

7.60 Groundwater abstraction does not form part of the proposed development. There will be no impact on local or regional groundwater resources (abstraction) as a result of the proposed development.

7.61 These potential impacts are not anticipated to occur following the implementation of mitigation measures outlined in Sections 7.79 – 7.80.

Do-Nothing Scenario

7.62 The proposed development is currently primarily agricultural land with two residential properties, which is zoned as '*EE: To provide for enterprise and employment related uses.'* It is likely that the land use will change over time even if this development does not go ahead. The associated impact of any such development will be similar to the proposed development for the underlying land soils and hydrogeological regime.

Remedial and mitigation measures

7.63 This section describes a range of mitigation measures designed to avoid or reduce any potential adverse geological and hydrogeological impacts identified.

Construction phase

7.64 In order to reduce impacts on the soils and geology environment, a number of mitigation measures will be adopted as part of the construction works on site. The measures will address the main activities of potential impact which include:

- Control of soil excavation and export from site;
- Sources of fill and aggregates for the proposed development;
- Fuel and chemical handling, transport and storage; and
- Control of water during construction.

Construction Environment Management Plan

7.65 An outline Construction Environmental Management Plan (CEMP) has been prepared by J.B Barry Consultimng Engineers for the proposed development and is included with the planning documentation. In advance of work starting on site, the works Contractor will prepare a detailed Construction Environmental Management Plan (CEMP). The detailed CEMP will set out the overarching vision of how the construction of the proposed development will be managed in a safe and organised manner by the Contractor. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and

standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent planning conditions relevant to the proposed development.

Control of soil excavation

7.66 Subsoil will be excavated to facilitate the construction of foundations and auxiliary works associated with the construction of the two storey substation and transmission lines. The proposed development will incorporate the reduce, reuse and recycle approach in terms of soil excavations on site. The construction will be carefully planned to ensure only material required to be excavated will be excavated resulting in as much material left in situ as possible.

7.67 It is unlikely any contaminated material will be encountered during construction of the proposed development. Nonetheless, any excavation works will be carefully monitored by a suitably qualified person to ensure any potentially contaminated soil is identified and segregated from clean/inert soil. In the unlikely event that any potentially contaminated soils are encountered, they should be tested and classified as hazardous or non-hazardous in accordance with the EPA *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* publication, HazWasteOnline tool or similar approved method. The material will then need to be classified as inert, non-hazardous, stable non-reactive hazardous or hazardous in accordance with *EC Decision 2003/33/EC*. It should then be removed from site by a suitably permitted waste contractor to an authorised waste facility.

7.68 Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated against through the implementation of appropriate earthworks handling protocol during construction. It is anticipated that any stockpiles will be formed within the boundary of the site and there will be no direct link or pathway from this area to any surface water body.

Export of material from site

7.69 It is estimated that approximately 1,556 m3 of topsoil, subsoils, tarmacadam / hardcore fill will be excavated to facilitate construction of the proposed transmission lines. It is currently envisaged that majority of this excavated material will require removal offsite for reuse, recovery and/or disposal. Refer to Chapter 14 Waste Management for further detail. In addition to the transmission lines, it is estimated that c. 24,700m^3 of topsoil and subsoils will be excavated for the substation, attenuation, and landscaping component of the proposed development. Suitable soils and stones will be reused on-site as backfill in the grassed areas, where possible. It is currently envisaged that all of the excavated material will be reused for a landscaping on site, and will require an additional import of c. c. 22,000m^3 of soil/stone fill to complete the landscaping aspects.

7.70 If any waste soil requires removal from site, it should be classified by an experienced and qualified environmental professional to ensure that the waste soil is correctly classified for transportation and recovery/disposal offsite. Refer to Chapter 14 Waste Management for further relevant information.

Sources of fill and aggregates

7.71 All fill and aggregate for the proposed development will be sourced from reputable suppliers. All suppliers will be vetted for:

- Aggregate compliance certificates/declarations of conformity for the classes of material specified for the proposed development;
- Environmental Management status; and
- Regulatory and Legal Compliance status of the Company.

Fuel and chemical handling

7.72 The following mitigation measures will be taken at the construction stage in order to prevent any spillages to ground of fuels and prevent any resulting soil and/or groundwater quality impacts:

- Designation of a bunded refuelling areas on the site;

- Provision of spill kit facilities across the site; and
- Where mobile fuel bowsers are used the following measures will be taken:
  - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
  - The pump or valve will be fitted with a lock and will be secured when not in use;
  - All bowsers to carry a spill kit
  - Operatives must have spill response training; and
  - Drip trays used on any required mobile fuel units.

7.73 In the case of drummed fuel or other potentially polluting substances which may be used during construction the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the site, they will be secured and on spill pallets; and
- Drums to be loaded and unloaded by competent and trained personnel using appropriate equipment.

7.74 The aforementioned list of measures is non-exhaustive and will be included in the CEMP.

Control of water during construction

7.75 No significant dewatering is required for the site development. However, run-off from excavations/earthworks cannot be prevented entirely and is largely a function of prevailing weather conditions. Earthwork operations will be carried out such that surfaces, as they are being raised, shall be designed with adequate drainage, falls and profile to control run-off and prevent ponding and flowing. These measures will ensure that there will be minimal inflow of shallow/perched groundwater into any excavation.

7.76 Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. All run-off will be prevented from directly entering into any watercourses/ drainage ditches.

7.77 Should any discharge of construction water be required during the construction phase, discharge will be to foul sewer. Pre-treatment and silt reduction measures on site will include a combination of silt fencing, settlement measures (silt traps, 20 m buffer zone between machinery and watercourses, refuelling of machinery off site) and hydrocarbon interceptors.

7.78 During the operational phase of the proposed development site, there is limited potential for site activities to impact on the geological and hydrogeological environment of the area. There will be no emissions to ground or the underlying aquifer from operational activities. There will be no impact on local or regional groundwater resources (abstraction) as a result of the proposed development.

Operational phase

7.79 The following mitigation measures will be undertaken at the operational stage to manage any leaks from vehicles resulting in soil and/or groundwater quality impacts:

- Provision of spill kit facilities and training of operatives in use of same;
- Where mobile fuel bowsers are used the following measures will be taken:
  - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
  - The pump or valve will be fitted with a lock and will be secured when not in use;
  - All bowsers to carry a spill kit;
  - Operatives must have spill response training; and
  - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

Increase in hardstand

7.80 A proportion of the development area will be covered in hardstand which includes the two other developments - data storage facility (SD20A/0324) and power generation application (SD20A/0058). This protects the underlying aquifer but also reduces local recharge in this area of the aquifer. As the area of the aquifer is large this reduction in local recharge will have no significant change in the natural hydrogeological regime.

Predicted impact of the Proposed Development

7.81 This section describes the predicted impact of the proposed development following the implementation of the remedial and mitigation measures.

Construction phase

7.82 The implementation of mitigation measures outlined in Sections 7.64 – 7.78 will ensure that the predicted impacts on the geological and hydrogeological environment do not occur during the construction phase and that the residual impact will be ***short-term-imperceptible-neutral****.* Following the TII criteria for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered ***negligible****.*

Operational phase

7.83 The implementation of mitigation measures highlighted in Sections 7.79 – 7.80 will ensure that the predicted impacts on the geological and hydrogeological environment do not occur during the operational phase and that the residual impact will be ***long-term-imperceptible-neutral.*** Following the TII criteria (Appendix 7.1) for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered ***negligible****.*

Residual impacts

7.84 Based on the natural conditions present and with appropriate mitigation measures to reduce the potential for any impact of accidental discharges to ground during the construction phase, the potential impact on land soils, geology and hydrogeology during construction (following EPA, 2017) are considered to have a ***short-term, imperceptible*** significance, with a ***neutral*** impact on quality.

7.85 There are no likely significant impacts on the land, geological or hydrogeological environment associated with the proposed operational development of the site with mitigation in place. As such the impact is considered to have a ***long-term, imperceptible*** significance with a ***neutral*** impact on quality i.e., no effects of effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.

7.86 Following the TII criteria for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of the impact is considered ***negligible*** for the construction and operational phases.

Cumulative impacts

7.87 The anticipated cumulative effect of the Proposed Development with any/all relevant other planned developments as outlined in Chapter 2 or permitted developments as outlined in Chapter 3 are discussed below for the construction and operational phases respectively. This consideration has included the permitted Power Generation Facility (SDCC Reg. Ref. SD20A/0058) and the concurrent application for an ICT Facility under SDCC Reg. Ref. SD20A/0324.

7.88 In relation to the potential cumulative impact on the geological or hydrogeological environment during the construction phases, the key engineering works which would have additional impacts above are:

- Construction works will require additional removal of topsoil and subsoil cover and will further increase the vulnerability of the underlying bedrock. Although this is minimised due to the underlying clayey overburden. Capping of significant areas of the sites by hardstand/ buildings following construction and installation of drainage will minimise the potential for contamination of groundwater.

- Contamination of soils and groundwater underlying the site from accidental spillage and leakage from construction traffic and construction materials may occur unless project-specific Construction Environmental Management Plans (CEMPs) are put in place and complied with. A project-specific CEMP's will be put in place for the proposed development.

7.89 In relation to the potential cumulative impacts from the operational stages, the following would apply:

- Overall increase in hardstanding: Cumulatively these developments will result in localised reduced recharge to ground and increase in surface run-off. The aquifer underlying the site is a locally important aquifer which is moderately productive only in local zones. Based on site specific and regional geological investigations there is circa 1 to 2 metres of overburden overlying the bedrock aquifer classifying it as "Extreme" vulnerability (GSI classification). The proposed development and known other development have a relatively small footprint in comparison to the underlying aquifer size. As such, the impact is considered to be Low.
- Accidental releases from fuel storage/unloading could contaminate groundwater or soil environments unless mitigated adequately. Localised accidental discharge of hydrocarbons could occur in car parking areas and along roads unless diverted to surface water drainage system with petrol interceptors. However, all developments are required to ensure they do not have an impact on the receiving water environment in accordance with the relevant legislation (primarily the Local Government (Water Pollution) Act, 1977 and 1990 as amended and Groundwater Threshold Value (Groundwater Directive S.I. No. 9 of 2010 and amendment; S.I. No. 366 of 2016) and EPA Interim Guidelines for groundwater where available) such that they would be required to manage runoff and fuel leakages.
- There will be a further loss of greenfield area locally however, the area of development is small in the context of the overall agricultural land available in the region. It is likely that the land use will change over time based on the current zoning of the proposed land in the vicinity as EE.
- The residual cumulative effect on land, soils, geology and hydrogeology for the construction and operation phases are anticipated to be long-term, neutral in terms of quality and of not significant, once the appropriate mitigation measures are put in place for each development.

8. HYDROLOGY

8.1 This chapter assesses and evaluates the potential impacts of the proposed development described in Chapter 2 (Description of the Proposed Development) on the surrounding water and hydrological environment. The impact on land, soils, geology, and hydrogeology is addressed in Chapter 7 (Lands, Soils, Geology and Hydrogeology). Chapter 15 (Material Assets) addresses the impacts on water supply, wastewater, and stormwater drainage.

Methodology

8.2 The methodology used in this assessment follows current European and Irish guidance as outlined in:

- Environmental Protection Agency (EPA), Advice Notes for Preparing Environmental Impact Statements Draft (September 2015)
- Environmental Protection Agency (EPA), Guidelines on the Information to be Contained in Environmental Impact Assessment Reports Draft (August 2017)
- Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report, European Union 2017
- Department of Housing, Planning and Local Government (DoHPLG), Guidelines for Planning Authorities and An Bord Pleanála on Carrying Out Environmental Impact Assessment (August 2018); and,
- Transport Infrastructure Ireland (TII) '*Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes',* by the Transport Infrastructure Ireland (2009).

Criteria for Rating Impacts

8.3 In assessing likely potential and predicted impacts, an account is taken of both the importance of the attributes and the predicted scale and duration of the likely impacts. The quality, significance and duration of potential impacts defined in accordance with the criteria provided in the EPA Draft EIA Report Guidelines (2017) for describing effects are summarised in Table 1.2 in Chapter 1. In addition, due significance is also given to the document entitled '*Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*' by Transport Infrastructure Ireland (2009) where appropriate. The Transport Infrastructure Ireland Authority (TII) criteria is summarised in Table 1 Appendix 8.1.

Sources of Information

8.5 This assessment was considered in the context of the available baseline information, potential impacts, consultations with statutory bodies and other parties, and other available relevant information. In collating this information, the following sources of information and references were consulted:

- Latest EPA Maps & Envision water quality monitoring data for watercourses in the area (these data can be accessed at https://gis.epa.ie/EPAMaps/ & catchments.ie);
- National River Basin Management Plan 2018-2021;
- Eastern River Basin District (ERBD) Management Plan;
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW);
- Office of Public Works (OPW) flood mapping data (www.floodmaps.ie);
- Flood points & Historical Floods – Office of Public Works (OPW) floods website www.floodmaps.ie;
- Relevant Eastern Catchment Flood Risk Assessment and Management (CFRAM) Flood Reports;
- Requirements for the Protection of Fisheries Habitat During Construction and Development Works at River Sites (Eastern Regional Fisheries Board (ERFB);
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters' (Inland Fisheries Ireland, 2016);
- South Dublin City Council (2005) Greater Dublin Strategic Drainage Study (GDSDS): Technical Documents of Regional Drainage Policies. Dublin: Dublin City Council;

- Greater Dublin Regional Code of Practice for Drainage Works: Version Draft 6.0 (Wicklow County Council, South Dublin County Council, Meath County Council, Kildare County Council, Fingal County Council, Dún Laoghaire- Rathdown County Council & Dublin City Council); and
- Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001).

8.4 Other relevant documentation consulted as part of this assessment included the following:

- Report and factual data provided by Ground Investigation Ireland (GII) – Dub 40 Site Investigations, Catherinstown House, Newcastle, Co. Dublin. Project no. 10109-10-20. October & November 2020.
- Data provided by Site Investigations Ireland (SII) – Grange Castle West Access Road Site Investigations, Newcastle, Co. Dublin. Project no. 5624:03/03. September 2019.
- Various design site plans and drawings; and
- Consultation with project engineers, J.B. Barry and Partners Engineering Consultants, and Clifton Scannell Emerson Associates Civil and Structural Consulting Engineers.

Receiving environment

8.5 The receiving environment is discussed in terms of hydrology, flood risk and water quality. The proposed development is located on existing agricultural lands and within public lands (greenfield and roadways) in Newcastle, Co. Dublin. It is proposed that the GIS substation and the western part of the 110kV transmission lines will be constructed alongside a permitted Power Generation Facility (SDCC Reg. Ref. SD20A/0058) and a proposed ICT Facility (SDCC Reg. Ref. SDC20A/0324). The 110kV transmission lines outside this site will follow the Peamount Road, old Nangor Road before passing under the Griffeen River to reach the east side of the Baldonnel Road (Please refer to engineering drawing by CSEA (Drawing no. 20_147-CSE-GEN-XX-DR-C-2120) attached with this application).

8.6 The site is zoned as – EE - with the objective "*To provide for enterprise and employment related uses"*. When the development is operational it will generate limited additional traffic, air, noise and water emissions.

Hydrology (Surface Water)

8.7 The main master plan site falls generally from south to north, with topographical levels ranging from c. 78mAOD in the south east to c. 75 mAOD in the north-west of the site. Regionally, topography gently decreases to the north towards the Grand Canal proposed National Heritage Area (pNHA). The area surrounding the proposed development is currently a mix of greenfield lands and industrial buildings (Grange Castle Business Park).

8.8 The grid connection route will connect the proposed Peamount 110kV GIS Substation to the existing 2 no. single 110kV underground circuits within the Castlebaggot-Kilmahud circuit to the east. The proposed transmission lines cover a distance of approximately 940m within the townlands of Milltown, and Clutterland. The route will pass outside of the site underneath the R120 (Peamount Road), the former Nangor Road, Griffeen River and the newly realigned Baldonnel Road.

8.9 The proposed development is within the River Liffey catchment, which encompasses an area of approximately 1,369 km^2. The river extends from the mountains of Kippure and Tonduff in County Wicklow to the sea at Dublin Bay. The main channel covers approximately 120 km and numerous tributaries enter along its course. The proposed development site is within the sub-catchment of the Griffeen River, Lucan Stream and Baldonnel Stream which are tributaries of the River Liffey.

8.10 The Griffeen River (stream) is located 0.16 km south-west from the proposed development site for the substation. The proposed route of the two 110kV transmission cables cross under the Griffeen River. It is proposed to horizontally drill beneath the waterbody for the installation of the transmission lines, refer to Figure 8.1 below. The Griffeen River rises in the townland of Greenoge, approximately 3.5 km south of the proposed development. It flows in a northerly direction where it is culverted beneath the Grand Canal and from there it flows north through Lucan. The Griffeen River enters the River Liffey just north of Lucan town. A section of the Griffeen was realigned during the construction of the Grange Castle Business Park and associated access roads. It now runs alongside the internal access road of the Business Park in a more northerly direction.

8.11 The Lucan Stream is located approx. 0.20 km north west of the proposed development site for the proposed substation. It flows in a northerly direction where it is culverted beneath the Grand Canal and from there it flows north through Lucan. The Lucan Stream enters the River Liffey just north of Lucan town.

8.12 Other notable hydrological features near the proposed development are the Baldonnell River, Camac River and the stream called 'Miltown 09' by the EPA. The Baldonnell River flows in a northerly direction and is a tributary to the Griffeen River. The River Camac runs from the south to the northeast, approximately 2.5 km south west of the proposed development site. The River Camac catchment is located immediately downstream of Baldonnell Business Park and has an estimated catchment area of 13.6 km^2 which is steep to moderately sloping (1% to 10%). The catchment area consists largely of greenfield, a section of residential areas on the outskirts of Saggart, Baldonnel Business Park and one-off residential / commercial developments. The Miltown 09 is a small stream running off the Griffeen River which runs through the site from north-west to south-east. It has been culverted discharging to the Griffeen to the north-east. The local hydrological environment is shown in Figure 8.1 below.

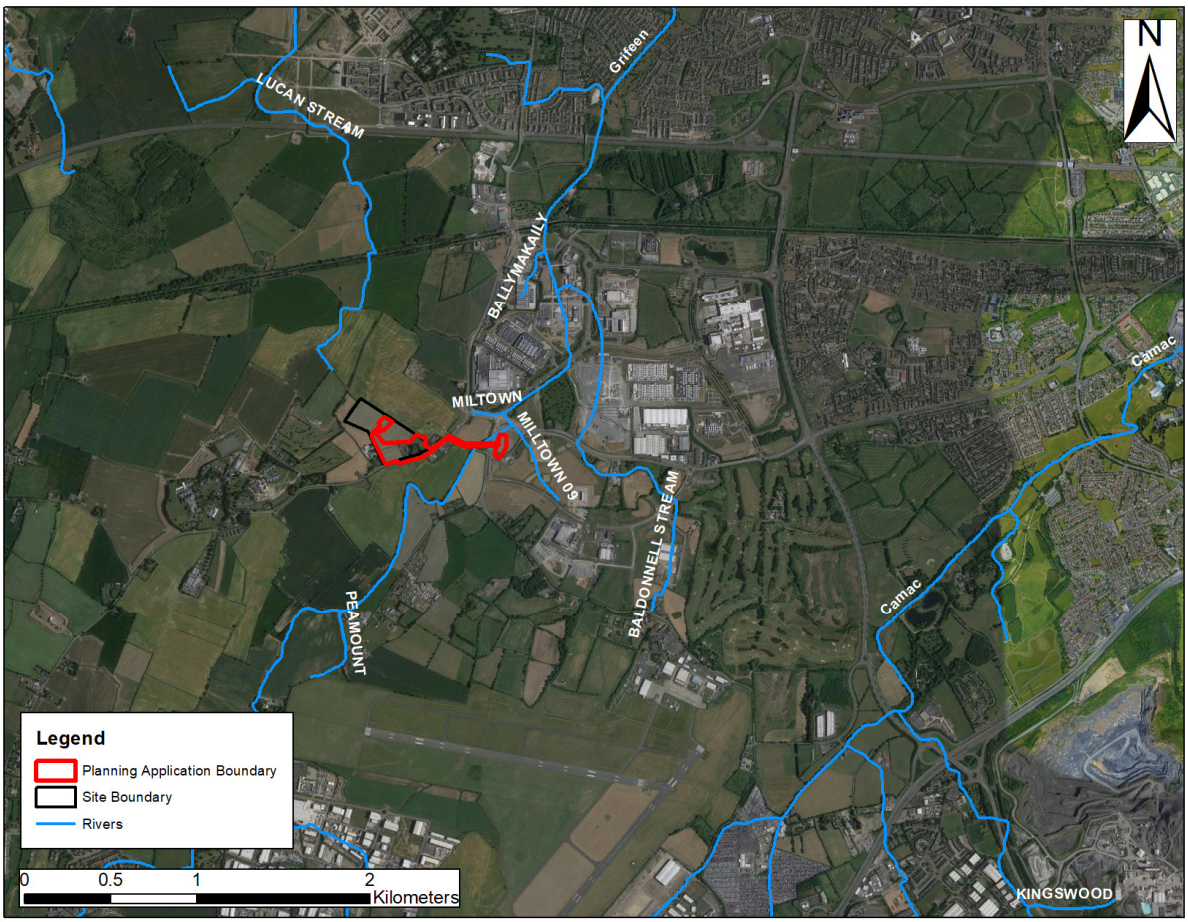

Figure 8.1 Local hydrological environment.

Surface Water Quality

8.13 The proposed development is located within the former ERBD (now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD). It is situated in Hydrometric Area No. 09 of the Irish River Network and is located within the River Liffey Catchment.

8.14 The WFD requires *'Good Water Status'* for all European waters to be achieved through a system of river basin management planning and extensive monitoring by 2015 or, at the least, by 2027. 'Good status' means both *'Good Ecological Status'* and *'Good Chemical Status'*. In 2009 the ERBD River Basin Management Plan (RBMP) 2009-2015 was published. In the ERBD RBMP, the impacts of a

range of pressures were assessed including diffuse and point pollution, water abstraction and morphological pressures (e.g., water regulation structures). The purpose of this exercise was to identify water bodies at risk of failing to meet the objectives of the WFD by 2015 and include a programme of measures to address and alleviate these pressures by 2015. This was the first River Basin Management planning cycle (2010-2015). The second cycle river basin management plan for Ireland is currently in place and will run between 2018-2021 with the previous management districts now merged into one Ireland River Basin District (Ireland RBD).

8.15 This second-cycle RBMP aims to build on the progress made during the first cycle. Key measures during the first cycle included the licensing of urban waste-water discharges (with an associated investment in urban waste-water treatment) and the implementation of the Nitrates Action Programme (Good Agricultural Practice Regulations). In more general terms, three key lessons have emerged from the first cycle and the public consultation processes. These lessons have been firmly integrated into the development of the second cycle RBMP. Firstly, the structure of multiple RBDs did not prove effective, either in terms of developing the plans efficiently or in terms of implementing those plans. Secondly, the governance and delivery structures in place for the first cycle were not as effective as expected. Thirdly, the targets set were too ambitious and were not grounded on a sufficiently developed evidence base. The second cycle RBMP has been developed to address these points.

8.16 The strategies and objectives of the WFD in Ireland have influenced a range of national legislation and regulations. These include the following:

- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003);
- European Communities (Drinking Water) Regulations 2014 (S.I. 122 of 2014);
- European Communities Environmental Objectives (Surface Waters); Regulations, 2009 (S.I. No. 272 of 2009 as amended by SI No. 77 of 2019)
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010 S.I. No. 366 of 2016);
- European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2010 (S.I. No. 610 of 2010);
- European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011 (S.I. No. 489 of 2011);
- Statutory Instrument (SI) No. 293 of 1988 European Communities (Quality of Salmonid Waters) Regulations 1988;
- Local Government (Water Pollution) Acts 1977-1990; and
- SI No. 258 of 1988 Water Quality Standards for Phosphorus Regulations 1998.

8.17 Figure 8.2 below presents the EPA quality monitoring points in the context of the site and other regional drainage settings.

Figure 8.2 Surface Water Quality Monitoring Point (EPA, 2021) (Site location of proposed substation indicated with red cross).

8.18 Surface water quality is monitored periodically by the EPA at various regional locations along with principal and other smaller watercourses. The EPA assess the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality.

8.19 In relation to the site, the nearest EPA monitoring stations are Griffeen (RS09G010200), located at the first bridge East of Milltown, and Baldonnell Stream (RS09B090400), located at Nangor Road. There is no monitoring station along the Lucan Stream. The status recorded from the Griffeen station and provided by the EPA in 1991 is classified as Q3- Poor. A station at the Lucan Bridge which monitors the River Liffey provides a more recent status of 'Good' water quality. This monitoring was undertaken between 2004 and 2016. Water quality is recorded approximately 400 m downstream from where the Griffeen River enters the River Liffey.

8.20 In accordance with the WFD, each river catchment within the former ERBD was assessed by the EPA and a water management plan detailing the programme of measures was put in place for each. Currently, the EPA classifies the Griffeen River, which leads into the Liffey River, waterbody as being 'at risk'. For the River Liffey WMU (Water Management Unit) the main pressure preventing the achievement of 'Good Status' is diffuse agricultural pollution. As part of the River Basin Management Plan 2009-2015, the water quality of the Griffeen Lower was assessed. The overall water quality status obtained for the Griffeen Lower was 'Bad' primarily due to its fish status and overall chemical status which each obtained a 'Bad' classification. The overall objective is to achieve 'Good' water quality status by 2027 however the Griffeen Lower has an overall risk rating of 'at risk of not achieving 'Good' status. Figure 8.3 presents the river waterbody risk EPA map.

Figure 8.3 River Waterbody Score – The Griffeen River and Lucan Stream (Liffey_170 in the figure above) is currently considered 'at risk' (Site location indicated with red cross).

Flood Risk

8.21 Project Engineers J.B Barry & Partners undertook a flood study which is included with the planning application. Based on the indicative flood mapping, the development site is located within Flood Zone C "Low Probability", with the 2 No. 110kV transmission lines will be underground. Therefore, this does not pose a risk to flooding. Therefore, the development is classified as appropriate for this flood zonation. Refer to the full flood report attached to this planning application – 19229-JBB-00-XX-RP-C-00009_HV Connection and Sub Station Flood Risk Assessment.

8.22 Stormwater drainage has been designed with enough capacity for the permitted and concurrent developments on the site – Power Generation Facility (SDCC Reg. Ref. SD20A/0058 and ICT facility (SDCC Reg. Ref. SD20A/0324). The attenuation for the proposed substation development is designed with SuDs measures. It is proposed to connect to the existing public surface water network to the exiting 450mm public sewer to the east of the site, approximately 550m away. This will necessitate laying a 225mm outfall pipe through the public roads, the R120 and former R134. Drainage requirements for these projects are designed to adhere to the Local Authority requirements, the Greater Dublin Strategic Drainage Study and has incorporated SuDS measures. As such there will be no adverse impact on flood risk for other neighbouring properties. Refer to the JB Baerry, Consulting Engineers Drawing no. 19229-JBB-00-XX-C-1500 and their Water Services Report 19229-JBB-00-XX-RP-C-00008.

Rating of site importance of the hydrological features

8.23 In accordance with the 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the TII (2009) the environmental significance of the nearest receiving environment (i.e., Griffeen River and Lucan Stream) has been considered as having low-quality significance or value on a local scale.

Characteristics of the Proposed Development

8.24 The proposed development primarily comprises the provision of two no. 110kV transmission lines and a 110kV Gas Insulated Switchgear (GIS) substation compound and Transformers / MV switch room compound along with associated and ancillary works and is described in detail within Chapter 2 of this EIA Report.

8.25 The proposed transmission lines will pass underneath the R120, the former Nangor Road, Griffeen River and the newly realigned Baldonnel Road. The development includes the connections to the proposed Peamount substation as well as to the Castlebaggot-Kilmahud circuit, changes to the attenuation pond permitted under SDCC Reg. Ref. SD20A/0058 and all associated construction and ancillary works.

8.26 The Griffeen River is located 0.17 km to the south-east of the proposed main development site. It is culverted through the Grange Castle Business Park and beneath the New Nangor Road where it flows northwards to the River Liffey. The Lucan Stream is located 0.20 km north-west of the proposed main development site and flows northerly towards the River Liffey.

8.27 The route of the two 110kV transmission lines intersect the Griffeen River, refer to Figure 8.1 above. Therefore, it is proposed to horizontal directional drill (HDD) underneath this waterbody. This is further discussed in Section 8.30, below.

8.28 A detailed description of the proposed development is provided in Chapter 2 of this EIA Report.

8.29 The characteristics of the proposed development regarding the hydrological environment, related to both construction and operation activities are described below.

Construction phase

8.30 The key civil engineering works which will have a potential impact on the water and hydrological environment during construction of the proposed development are summarised below.

(i) Excavations are required for foundations of the two-storey substation and installation of services including the ducting for the 110kV transmission lines;
(ii) Possible discharge of collected rainwater during excavation works and groundworks (the extent of which is dependent on the time of year development works are carried out);
(iii) Construction activities will necessitate storage of cement and concrete materials, temporary oils, and fuels on site. Small localised accidental releases of contaminating substances including hydrocarbons have the potential to occur from construction traffic and vehicles operating on site; and

(iv) Horizontal Directional Drilling (HDD) drilling underneath the Griffeen River is required for the installation of the two transmission cables. It is proposed to drill underneath this waterbody through the Dublin Boulder Clay and underlying Limestone Calp bedrock. A feasibility study was carried out by Geo Drilling Solutions for the Horizontal Directional Drilling (HDD) beneath the Baldonnell Road & Griffeen River. Based on a review of the local information and historical and present-day knowledge on the ground conditions near the site, it is not anticipated that any exceptional or unusual risks are posed by the ground conditions which would cause difficulties during HDD operations at the site. Refer to the report GD2073 Grange Castle 110kV ESB Trenchless Crossing attached to this application.

Operational phase

8.31 The key activities which will have a potential impact on the hydrological environment during operation of the Proposed Development are summarised below:

(i) Increase in local overall hardstand by c. 2,400m^2.
(ii) The attenuation for the proposed substation development has been designed to account for the permitted development and concurrent application at the proposed development site. Storm water will be discharged following attenuation to the surface water system located to the south of the site as proposed in the concurrent planning application under SD20A/0324. Refer to the JB Barry Consulting Engineers Drawing no. 19229-JBB-00-XX-DR-C-1005 and the details of the drainage system is set in their Water Services Report (19229-JBB-00-XX-RP-C-00008) submitted as part of this planning application. Potential contamination of surface water with hydrocarbons from vehicle movements and other areas could cause downstream contamination if no controls are in place;
(iii) Wastewater generation will be minimal and will be discharged to the foul water drainage system installed during the proposed development (no discharges to ground/surface waters) which will discharge to the existing foul drainage system located to the east of the site proposed as part of the concurrent planning application SDCC Reg. Ref. SD20A/0324 and which are replicated again under this application. Refer to the Water Services Report (19229-JBB-00-XX-RP-C-00008_Water_Services_Report_P01.01); and
(iv) Water supply (minimal requirement) will be from the public water main (via a connection to an existing 700 mm Ø main located along the Peamount Road, adjacent to the southern boundary of the property) and will not require surface water/groundwater abstraction. See project engineers J.B Barry & Partners' Water Services Report and associated drawings attached to this application for more information.

Potential impacts of the Proposed Development

8.32 The potential impacts in relation to surface water during the construction and operational phases are outlined below. The assessment of effects defined is based on the description of effects as set out in the EPA Guidelines (2017) (refer to Table 1.2 Chapter 1) and the TII criteria detailed in Appendix 8.1.

Construction phase

8.33 Surface water run-off from site preparation, levelling and excavations during the construction phase may contain increased silt levels or become polluted from construction activities. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses. Silt water can arise from excavations, exposed ground, stockpiles, and access roads.

8.34 During the construction phase, there is potential for a slight increase in run-off due to the introduction of impermeable surfaces and the compaction of soils. This will reduce the infiltration capacity and increase the rate and volume of direct surface run-off. The potential impact of this is a possible increase in surface water run-off and sediment loading which could potentially impact local drainage, if not adequately mitigated.

8.35 The Griffeen River will be drilled underneath for the installation of the two (2) no. transmission lines as part of this development. The use of horizontal drilling (HDD) will ensure that there will be no impact on the bed of the Griffeen River. It is proposed that the drilling will commence approx. 7 metres beneath

the river. The HDD is crossing beneath the river; therefore, due care is required when managing the drilling fluids.

8.36 The Lucan Stream is the closest surface water receptor to the Proposed Development site for the substation. It is located approx. 0.20 km north-west of the Proposed Development site. It flows in a northerly direction where it is culverted beneath the Grand Canal and from there it flows north through Lucan. The Lucan Stream enters the River Liffey just north of Lucan town. Based on the chemical storage at the site and the distance, there is no likely source-pathway receptor linkage with European designated sites in Dublin Bay i.e. North Dublin Bay SAC, South Dublin Bay SAC, South Dublin Bay, River Tolka Estuary SPA and North Bull Island SPA.

8.37 The Proposed Development will require site preparation, excavations and levelling for foundations, and the trenching works associated with the installation of services. Some removal of perched rainwater from the excavation may be required. Volumes will be quite low, and all pumped water will be subject to on site settlement before release.

8.38 During the construction phase, there is a risk of accidental pollution incidences from the following sources:

- Spillage or leakage of fuels (and oils) stored on site;
- Spillage or leakage of fuels (and oils) from construction machinery or site vehicles;
- Spillage of oil or fuel from refuelling machinery on site;
- The use of concrete and cement; and
- Storage of chemical on site.

8.39 Machinery activities on site during the construction phase may result in contamination of runoff/surface water. Potential impacts could arise from accidental spillage of fuels, oils, paints etc. which could impact surface water if allowed to infiltrate to runoff to surface water systems and/or receiving watercourses. However, implementation of the mitigation measures detailed in Sections 8.53 onwards will ensure that this does not occur.

8.40 Concreting operations carried out near surface water drainage points during construction activities could lead to discharges to a watercourse. Concrete (specifically, the cement component) is highly alkaline and any spillage to a local watercourse would be detrimental to water quality and local fauna and flora. However, employment of the mitigation measures highlighted in Sections 8.53 onwards will ensure that any impact will be mitigated.

Operational phase

Surface Water

8.41 Rainwater runoff from the substation roofs, car parking areas and yard will be collected in stormwater drainage channels and diverted to a stormwater attenuation system (sized for a 1 in 100-year rainfall event +20% climate change). The surface water drainage system has capacity to incorporate all developments within the main site of the substation, permitted PGF and proposed ICT facility. This surface water drainage system is being installed as part of the planning permission and will be amended slightly from that granted under SDCC Reg. Ref. SD20A/0058. The SuDs features have been designed to accommodate surface water drainage from the entire development on site. Attenuation measures include bio retention areas, attenuation ponds, swales, filter drains, permeable paving and hydrocarbon interceptors. Refer to Refer to the planning drawings 19229-JBB-00-XX-DR-C-1005 and the details of the drainage system is set in the water services report (19229-JBB-00-XX-RP-C-00008) provided as part of this planning application.

8.42 The drainage design for the Proposed Development includes an oil separator interceptor system to ensure the quality of stormwater discharge is controlled prior to discharge. It is proposed that the hardstanding areas that drain surface water from hardstanding areas and shall pass through full Class 1 forecourt separators prior to entering the surface water drainage system. The development also includes Class 1 by-pass separators prior to the attenuation ponds in order to treat rainfall and prevent hydrocarbon spillages entering the stormwater system.

8.43 The attenuated stormwater will be discharged at the allowable greenfield runoff rate to the local drainage system located at the southern boundary of the site. It is proposed to use 'Hydrobrake' flow control systems to achieve the required discharge rates. Further detail on the stormwater drainage system and the basis of its design is provided for in the water services report.

8.44 There will be additional hardstanding (2,400m^2) due to the construction of the proposed substation and auxiliary works.

8.45 Foul water will be discharged to the proposed foul water sewer system proposed, and replicated under this application, under the concurrent application for the ICT facility under SDCC Reg. Ref. SD20A/0324. It is proposed to connect to the existing 450mm public sewer to the east of the site, approximately 550m away. Details on this is discussed in the JB Barry, Consulting Engineers, Water Services Report (19229-JBB-00-XX-RP-C-00008) attached to the planning application.

Wastewater

8.46 There is no Irish Water foul water infrastructure adjacent to the site. The Proposed Development will discharge via a new 225mm sewer to the exiting 375mm public sewer to the east of the site, approximately 550m away, as shown on drawing no. 19229-JBB-00-XX-DR-C-01500. All relevant wayleave and permissions would need to be obtained by the applicant. Details on this is discussed in the JB Barry, Consulting Engineers, Water Services Report (19229-JBB-00-XX-RP-C-00008) that forms part of this planning application.

Water Supply

8.47 The proposed development will be supplied from the existing 4'' AC watermain in the public road directly outside the site as shown on JB Barry Drawing no. 19229-JBB-00-XX-DR-C-01502. A Pre-Connection Enquiry form was submitted to Irish Water on 24th February 2020 as part of the Power Generation Facility that was permitted under SDCC Reg. Ref. SD20A/0058. The water supply of this project will serve the proposed substation development.

Fuel and Other Accidental Spills

8.48 There is a potential for leaks and spillages from vehicles along access roads and in parking areas. Any accidental emissions of oil, petrol or diesel could cause contamination if the emissions enter the water environment unmitigated.

8.49 There is no direct pathway to surface water from this site, furthermore, based on design and mitigation measures discussed in Sections 8.68 onwards there will be no impact on the receiving surface water bodies i.e. Lucan Steam, the Baldonnell Stream and Griffeen River.

Do-Nothing Scenario

8.50 The proposed development land is currently agricultural land; the land is zoned as '*EE: To provide for enterprise and employment related uses.'* It is likely that the land use will change over time even if this development does not go ahead. The associated impact of any such development will be similar to the proposed development for the underlying land soils and hydrogeological regime.

Remedial and Mitigation Measures

8.51 The design of the proposed development has taken account of the potential impacts of the development and the risks to the water environment specific to the areas where construction is taking place.

8.52 There are two watercourses (Lucan & Griffeen waterbodies) to the west and south east, which are tributaries of the River Liffey, therefore caution is required to mitigate the potential effects on the local water environment. It is proposed to drill underneath the Griffeen River. Horizontal Directional Drilling procedures incorporate due care as described in the Geo Drilling Solutions Report for CSEA - GD2073 Grange Castle 110kV ESB Trenchless Crossing that forms part of this application. The Lucan Stream is open channel close to the proposed development as discussed above in this chapter. It is culverted

through the Grand Canal pNHA and Adamstown further downstream. Construction works will have a buffer zone from any drainage ditches which discharge to this waterbody or any waterbody in the area. Therefore, there is no direct impact to this waterbody. There is no direct hydraulic link to the Griffeen or River Liffey or the Grand Canal pNHA to the north. The following measures seek to avoid or minimise potential effects in the main through the implementation of best practice construction methods and adherence to all relevant legislation.

Construction phase

Construction Environmental Management Plan (CEMP)

8.53 An outline Construction Environmental Management Plan (CEMP) has been prepared by J.B. Barry Consulting Engineers for the proposed development and is included with the planning documentation. A detailed CEMP will be prepared and maintained by the appointed contractors during the construction phase of the proposed project. The CEMP will cover all potentially polluting activities and include an emergency response procedure. All personnel working on the site will be trained in the implementation of the CEMP. At a minimum, the CEMP will be formulated in consideration of the standard best international practice including, but not limited, to:

- CIRIA, (2001), *Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, (C532)* Construction Industry Research and Information Association;
- CIRIA (2002) *Control of water pollution from construction sites: guidance for consultants and contractors (SPI56)* Construction Industry Research and Information Association;
- CIRIA (2005), *Environmental Good Practice on Site* (C650); Construction Industry Research and Information Association;
- BPGCS005, *Oil Storage Guidelines*;
- CIRIA 697 (2007), *The SuDS Manual*; and
- *UK Pollution Prevention Guidelines,* (PPG) UK Environment Agency, 2004.

8.54 All contractors will be required to implement the CEMP.

Surface Water Run-off

8.55 As there is potential for run-off to enter current stormwater systems and indirectly discharge to a watercourse, mitigations will be put in place to manage run-off during the construction phase.

8.56 Run-off water containing silt will be contained on site via settlement tanks and treated to ensure adequate silt removal. Silt reduction measures on site will include a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds).

8.57 The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection. This will prevent any potential negative impact on the stormwater drainage and the material will be stored away from any surface water drains. Movement of material will be minimised to reduce the degradation of soil structure and generation of dust. Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations. Soil from works will be stored away from existing drainage features to remove any potential impact.

8.58 Before any works commence for the HDD process, a mud engineer along with the driller will design a drilling programme to include a mud blend for the profile. The starting drilling pad is located c. 50metres east from the Griffeen River. The exit drilling pad is located approx. 30 metres west from the Griffeen River. The drilling route is proposed to be approx. 9.7 metres beneath the river. This will avoid any potential impacts to the Griffeen River.

8.59 In order to minimize the risk of mud breakouts, care shall be taken to keep the mud pressures between the minimum and maximum calculated pressures. The driller and mud engineer, from experience, will know when to increase the viscosity of the drilling fluid in formations that are prone to break out and reduce the ROP so not to overload the annulus with cuttings. Monitoring the discharge of cuttings over the shale shakers is important, excessive material will indicate a wash out in formation. It is important

that any losses to formation are recorded and addressed as this is an early tell-tale sign of a potential breakout.

8.60 Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site and the suitable distance of topsoil piles from surface water drains will be maintained.

Fuel and Chemical Handling

8.61 The following mitigation measures will be taken at the construction stage in order to prevent any spillages of fuels and prevent any resulting impacts to surface water systems.

- Designation of a bunded refuelling areas on the site;
- Provision of spill kit facilities across the site;
- Where mobile fuel bowsers are used the following measures will be taken:
  - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
  - The pump or valve will be fitted with a lock and will be secured when not in use;
  - All bowsers will carry a spill kit and operatives must have spill response training; and
  - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

8.62 In the case of drummed fuel or other potentially polluting substances which may be used during construction the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded areas;
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage;
- All drums to be quality approved and manufactured to a recognised standard;
- If drums are to be moved around the site, they should be done so secured and on spill pallets; and
- Drums to be loaded and unloaded by competent and trained personnel using appropriate equipment.

8.63 All ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated stormwater to the underlying subsoil. Wash-down and washout of concrete transporting vehicles will take place at an appropriate facility offsite.

Accidental Releases

8.64 Emergency response procedures will be outlined in the detailed CEMP. All personnel working on the site will be suitably trained in the implementation of the procedures.

Soil Removal and Compaction

8.65 Temporary storage of soil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment. The material will be stored away from any surface water drains (see Surface Water Run-off section above). Movement of material will be minimised to reduce degradation of soil structure and generation of dust.

8.66 All excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.

8.67 Site investigations carried out at the site in October/ November 2020 found no residual contamination on site. Nonetheless, all excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is

contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.

Operational phase

Environmental Procedures

8.68 During operation the site will operate in compliance with the requirements of an Irish Water (IW) licence for discharge to sewer. The following containment measures are included within the design to reduce potential for environmental impact. There will be comprehensive emergency response procedures and standard operating procedures to respond to chemical spillage of all types. All employees will be provided with such equipment, information, training and supervision as is necessary to implement the emergency response procedures and standard operating procedures.

Storm Water & Foul Sewer Drainage

8.69 The proposed development will provide a significant improvement to the local drainage catchment as it is proposed to provide full attenuation for increase in hardstand area in compliance with the requirements of the Greater Dublin Strategic Drainage Study. A number of measures will be put in place to minimise the likelihood of any spills entering the water environment to include the design of the car park, fitting of refuelling areas with hydrocarbon interceptors and on-site speed restrictions. Refer to the JB Barry, Consulting Engineers Drawing no. 19229-JBB-00-XX-DR-C-01500 and their Water Services Report (19229-JBB-00-XX-RP-C-00008).

8.70 It is proposed to ultimately discharge surface water from the proposed development, post attenuation and outflow restrictions, to the pre-existing surface water drainage system located along Baldonnel Road where it will connect into the private SDCC waste water treatment system within Grange Castle Business Park.

Water Supply

8.71 Irish Water has confirmed available capacity for the required water supply for this development A Confirmation of Feasibility was issued by Irish Water on the 14th April 2020 and a copy of this is included with the JB Barry, Water Services Report (19229-JBB-00-XX-RP-C-00008). Flow monitoring for the purpose of billing and leakage monitoring shall be installed at the interface of the public and private mains. The detail of the meter and enclosure required shall be agreed with the water authority in advance of construction.

8.72 Water meters in line with South Dublin County Council and Irish Water requirements and specifications, will be installed at the connections onto the aforementioned existing water mains as required.

Predicted Impacts of the Proposed Development

8.73 This section describes the predicted impact of the proposed development following the implementation of the remedial and mitigation measures.

Construction phase

8.74 The implementation of mitigation measures highlighted in Sections 8.53 onwards will ensure that the potential impacts on the surface water environment do not occur during the construction phase and that the predicted impact will be ***short-term-imperceptible*** and ***neutral****.*

Operational phase

8.75 The implementation of mitigation measures highlighted in Sections 8.68 onwards will ensure that the potential impacts on the surface water environment do not occur during the operational phase and that the predicted impact will be ***long-term-imperceptible*** and ***neutral.***

Residual Impacts

8.76 In the case of the Proposed development, there will be no significant residual impacts; the potential impact on surface water during operation and closure (following the EPA Draft EIA Report Guidelines (2017) will be ***long term, imperceptible*** and ***neutral*** i.e. an impact capable of measurement but without noticeable consequences.

Cumulative Impacts

8.77 The anticipated cumulative effect of the Proposed Development with any/all relevant other planned developments as outlined in Chapter 2 or permitted developments as outlined in Chapter 3 are discussed below for the construction and operational phases respectively. This consideration has included the permitted power generation facility (SDCC Reg. Ref. SD20A/0058) and the concurrent application for the ICT facility under SDCC Reg. Ref. SD20A/0324.

8.78 In relation to the potential cumulative impact on hydrology during the construction phases, the construction works which would have potential cumulative impacts include:

- Surface water run-off during the construction phase may contain increased silt levels or become polluted from construction activities. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses; and
- Contamination of local water sources from accidental spillage and leakage from construction traffic and construction materials unless project-specific CEMPs are put in place for each development and complied with.

8.79 Potential cumulative impacts included in the operational phase include:

- Increased hard standing areas will reduce local recharge to the ground and increase surface water run-off potential if not limited to the green field run-off rate from the site;
- Increased risk of accidental releases from fuel storage/delivery unless mitigated adequately i.e. bunded tank;
- Increased risk of accidental discharge of hydrocarbons from car parking areas and along roads and unless diverted to surface water system with petrol interceptor; and
- Any additional foul discharges should be treated where appropriate and/or diverted to the foul sewer system and not directly to ground.

8.80 All developments will be required to manage any discharges to water and operate in compliance with relevant legislation (European Communities Environmental Objectives (Surface Waters); Regulations, 2009 (S.I. No. 272 of 2009 as amended by SI No. 77 of 2019). As such there will be no likely cumulative impact on water quality.

8.81 Increase in wastewater loading and water supply requirement is an impact of all development. Each development will require approval from IW confirming available capacity in the water and wastewater infrastructure. The surface water and foul drainage infrastructure and water supply requirements for the data storage campus development has been designed and assessed to accommodate the proposed development.

8.82 Development will result in an increase in hard standing which will result in localised reduced recharge to ground and an increase in run-off rate. However, each permitted development is required by the Local Authority and IW to comply with the Greater Dublin Strategic Drainage Strategy (GDSDS) and Local Authority and IW requirements by providing suitable attenuation on site to ensure greenfield run-off rates and ensure that there is no increase in offsite flooding as a result of development.

8.83 The residual cumulative impact on water and hydrology for the construction and operation phases is anticipated to be ***long-term***, ***neutral*** in terms of quality and ***not significant***, once appropriate mitigation measures to manage water quality runoff in compliance with legislative requirement are put in place for each development.

9. NOISE AND VIBRATION

9.1 As detailed in Chapter 1 Introduction, this EIAR has been prepared to accompany an application for the development of a 110kV Gas Insulated Switchgear (GIS) substation and grid connection: The proposed development primarily comprises the provision of two no. 110kV transmission lines and a 110kV GIS substation compound and Transformers / MV switch room compound along with associated and ancillary works.

9.2 Two proposed underground single circuit 110kV transmission lines will connect the proposed Peamount 110kV GIS Substation to the existing 2 no. single 110kV underground circuits within the Castlebaggot-Kilmahud circuit to the east. The proposed transmission lines cover a distance of approximately 940m within the townlands of Milltown and Clutterland. They will pass outside of the site underneath the R120, the former Nangor Road, Griffeen River and the newly realigned Baldonnel Road.

9.3 The nearest residential noise sensitive locations are located to the south-east and south-west of the GIS substation part of the site where several dwellings are located along both the Peamount Road and other local roads. There is a halting site some distance to the north-east of the substation site.

9.4 The proposed development has been assessed and discussed in terms of the potential noise and vibration impacts on the surrounding environment.

9.5 Permission has been granted within the wider substation site for a Power Generation Facility to the north of the substation under South Dublin County Council (SDCC) Reg. Ref. SD20A/0058. An application has also been lodged under SDCC Reg. Ref. SD20A/0324 for an ICT facility on the lands to the south of the proposed substation. The Planning Authority have requested Additional Information on this application. The noise assessment is undertaken on a cumulative basis taking into consideration this application, the permitted PGF and ICT facility.

Methodology

9.6 The following methodology has been adopted for this assessment:

- review appropriate guidance, typical local authority planning conditions, etc. in order to identify appropriate noise criteria for the site operations;
- carry out noise monitoring at a number of locations (e.g. in the vicinity of nearest sensitive properties/boundaries) to identify existing levels of noise in the vicinity of the development;
- development of a detailed 3D noise model to consider the cumulative sites, i.e. the proposed development along with the power generation facility; and
- comment on predicted levels against the appropriate criteria and existing noise levels and outline required mitigation measures (if any).

9.7 Appendix 9.1 of the Appendix document presents a glossary of the acoustic terminology used throughout this document. In the first instance it is considered appropriate to review some basic fundamentals of acoustics.

Fundamentals of Acoustics

9.8 In order to provide a broader understanding of some of the technical discussion in this report, this section provides a brief overview of the fundamentals of acoustics and the basis for the preparation of this noise assessment.

9.9 A sound wave travelling through the air is a regular disturbance of the atmospheric pressure. These pressure fluctuations are detected by the human ear, producing the sensation of hearing. In order to take account of the vast range of pressure levels that can be detected by the ear, it is convenient to measure sound in terms of a logarithmic ratio of sound pressures. These values are expressed as Sound Pressure Levels (SPL) in decibels (dB).

9.10 The audible range of sounds expressed in terms of Sound Pressure Levels is 0dB (for the threshold of hearing) to 120 dB (for the threshold of pain). In general, a subjective impression of doubling of

loudness corresponds to a tenfold increase in sound energy which conveniently equates to a 10 dB increase in SPL. It should be noted that a doubling in sound energy (such as may be caused by a doubling of traffic flows) increases the SPL by 3dB.

9.11 The frequency of sound is the rate at which a sound wave oscillates and is expressed in Hertz (Hz). The sensitivity of the human ear to different frequencies in the audible range is not uniform. For example, hearing sensitivity decreases markedly as frequency falls below 250 Hz. In order to rank the SPL of various noise sources, the measured level has to be adjusted to give comparatively more weight to the frequencies that are readily detected by the human ear. Several weighting mechanisms have been proposed but the 'A-weighting' system has been found to provide one of the best correlations with perceived loudness. SPL's measured using 'A-weighting' are expressed in terms of dB(A). An indication of the level of some common sounds on the dB(A) scale is presented in Figure 9.1.

9.12 The 'A' subscript denotes that the sound levels have been A-weighted. The established prediction and measurement techniques for this parameter are well developed and widely applied. For a more detailed introduction to the basic principles of acoustics, reference should be made to an appropriate standard text.

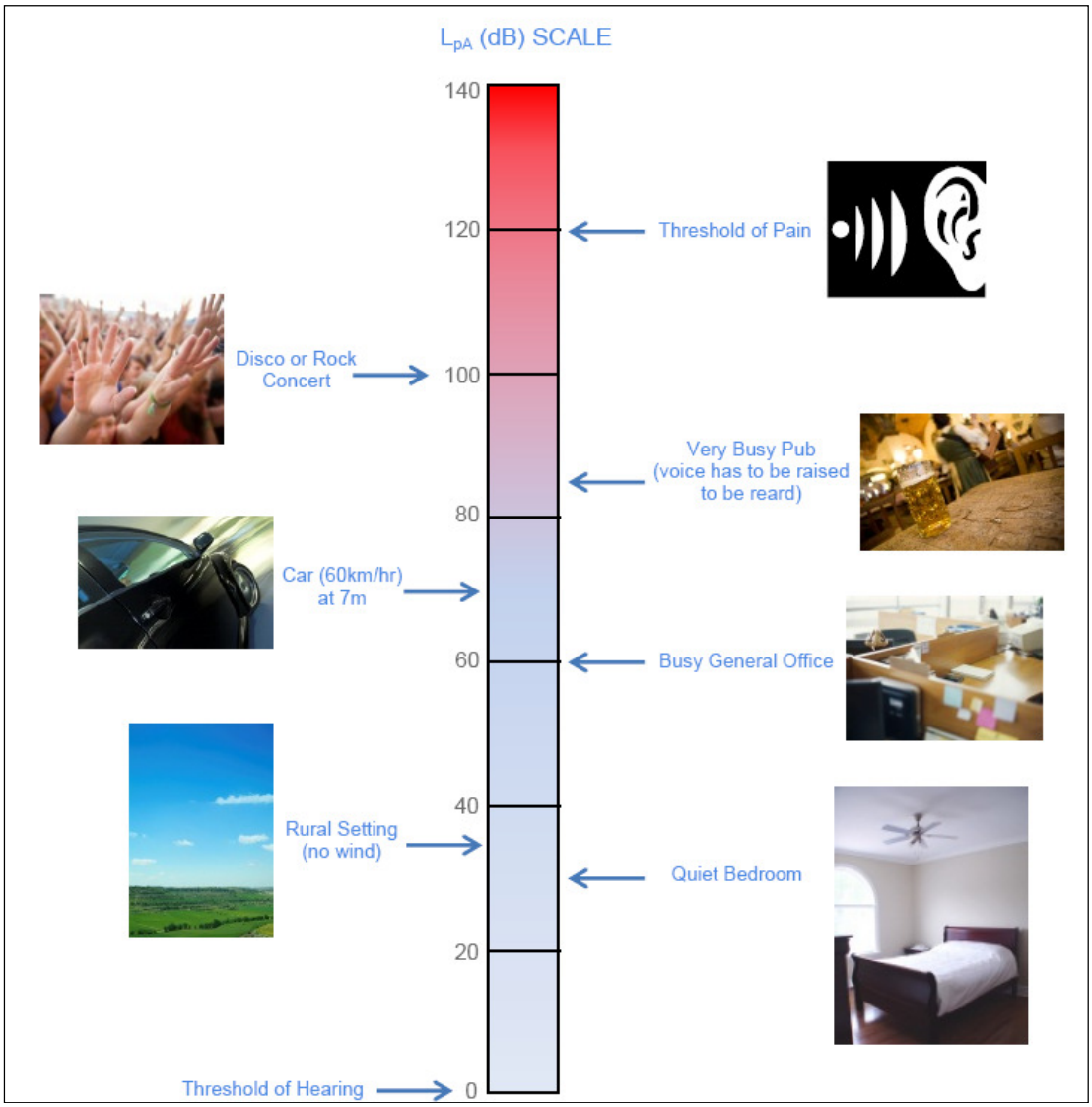

Figure 9.1 dB(A) Scale & Indicative Noise Levels – (EPA: Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4 – 2016))

Significance of Impacts

9.13 The significance of noise and vibration impacts has been assessed in accordance with the EPA Draft EIA Report Guidelines 2017 and EPA Draft Advice Notes for EIS 2015 see Tables 9.1 to 9.3 below. As these guidelines do not quantify the impacts in decibel terms, further reference has been made to

the *Guidelines for Environmental Noise Impact Assessment*' produced by the Institute of Environmental Management and Assessment (IEMA) (2014).

9.14 With regard to the quality of the impact, ratings may have positive, neutral or negative applications where:

Table 9.16 Quality of Potential Effects

Quality of Effects	Definition
Negative	A change which reduces the quality of the environment (e.g. by causing a nuisance).
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment (e.g. by removing a nuisance).

9.15 The significance of an effect on the receiving environment are described as follows:

Table 9.17 Significance of Effects

Significance of Effects on the Receiving Environment	Description of Potential Effects
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline 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 a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

9.16 The duration of effects as described in the Draft EPA Guidelines are:

Table 9.18 Duration of Effects

Duration of Impact	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

Construction Phase Guidance

Criteria for Rating Noise Impacts

9.17 There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local authorities normally control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

9.18 In the absence of specific noise limits, appropriate criteria relating to permissible construction noise levels for a development of this scale may be found in the *British Standard BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise*.

9.19 The approach adopted in BS5228 – 1 calls for the designation of a noise sensitive location into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a significant noise impact is associated with the construction activities.

9.20 BS5228 – 1 sets out guidance on permissible noise levels relative to the existing noise environment. Table 9.4 sets out the values which, when exceeded, signify a significant effect at the facades of residential receptors as recommended by BS 5228 – 1. These are construction noise levels only and not the cumulative noise level due to construction plus existing ambient noise.

Table 9.19 Example Threshold of Significant Effect at Dwellings

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A Note A	Category B Note B	Category C Note C
Night-time (23:00 to 07:00hrs)	45	50	55
Evenings and weekends Note D	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

Note A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.
Note B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.
Note C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.
Note D) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

9.21 It should be noted that this assessment method is only valid for residential properties.

9.22 For the appropriate periods (i.e. daytime, evening and night-time) the ambient noise level is determined and rounded to the nearest 5 dB. Baseline monitoring carried out as part of this assessment would indicate that the categories detailed in Table 9.5 are appropriate in terms of the nearest noise sensitive locations being considered in this instance.

Table 9.20 Rounded Baseline Noise Levels and Associated Categories

Period	Baseline Noise Category	Construction Noise Threshold Value $L_{Aeq,1hr}$ (dB)
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	A	65
Evening (19:00 to 23:00hrs)	A	55
Night time (23:00 to 07:00hrs)	A	45

9.23 If the construction noise level exceeds the appropriate category value, then a significant effect is deemed to occur. This assessment process determines if a significant construction noise impact is likely. Notwithstanding the outcome of this assessment, the overall acceptable levels of construction noise are set out in the Transport Infrastructure Ireland (TII) publication *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*[15], which should not be exceeded at noise sensitive locations during the construction phase of the development. Table 9.6 sets out these levels.

[15] *Guidelines for the Treatment of Noise and Vibration in National Road Schemes, Revision 1, 25 October 2004*, Transport Infrastructure Ireland

Table 9.21 Maximum Permissible Noise Levels at the Facade of Dwellings during Construction

Days and Times	Noise Levels (dB re. $2x10^{-5}$ Pa)	
	$L_{Aeq(1hr)}$	L_{Amax}
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60*	65*
Saturdays 08:00 to 16:30hrs	65	75
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

Note * Construction activity at these times, other than that required for emergency works, will normally require the explicit permission of the relevant local authority.

9.24 In exceptional circumstances there may be a requirement that certain construction works are carried out during night-time periods. In these instances, the relevant evening (60 dB L_{Aeq1hr}) and night time (50 dB $L_{Aeq,1hr}$) will apply.

9.25 Therefore, based on the above the following construction noise criteria are proposed for the site in relation to day to day works during the stated construction hours:

65 dB $L_{Aeq,1hr}$ at noise sensitive location
75 dB $L_{Aeq,1hr}$ at commercial property

Criteria for Rating Vibration Impacts

9.26 Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. In both instances, it is appropriate to consider the magnitude of vibration in terms of Peak Particle Velocity (PPV).

9.27 It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of road traffic, vibration is perceptible at around 0.5 mm/s and may become disturbing or annoying at higher magnitudes. However, higher levels of vibration are typically tolerated for single events or events of short duration. For example, rock breaking and piling, two of the primary sources of vibration during construction, are typically tolerated at vibration levels up 2. 5mm/s. This guidance is applicable to the daytime only; it is unreasonable to expect people to be tolerant of such activities during the night.

9.28 Guidance relevant to acceptable vibration within buildings is contained in the following documents:

- British Standard BS 7385: 1993: *Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration*, and;
- British Standard BS 5228-2: 2009+A1:2014: *Code of practice for noise and vibration control on construction and open sites – Vibration*.

9.29 BS 7385 states that there should typically be no cosmetic damage if transient vibration does not exceed 15mm/s at low frequencies rising to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. These guidelines relate to relatively modern buildings and should be reduced to 50% or less for more critical buildings.

9.30 BS 5228 recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. Below these values minor damage is unlikely. Where continuous vibration is such as to give rise to dynamic magnification due to resonance, the guide values may need to be reduced by up to 50%. BS 5288-2 also comments that important buildings which are difficult to repair might require special consideration on a case by case basis.

9.31 The TII document *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* also contains information on the permissible construction vibration levels as follows:

Table 9.22 Allowable Vibration during Construction Phase

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of		
Less than 10Hz	10 to 50Hz	50 to 100Hz (and above)
8 mm/s	12.5 mm/s	20 mm/s

Operational Phase – Noise Guidance

9.32 BS 4142:2014+A1:2019: Methods for rating and assessing industrial and commercial sound is the industry standard method for analysing building services plant sound emissions to residential receptors. BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident. It should also be noted that the Environmental Protection Agency (EPA) document "Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities" (NG4 - 2016) indicates that this assessment methodology should be used in the assessment of complaints associated with a site's operations.

9.33 For an appropriate BS 4142 assessment it is necessary to compare the measured external background sound level (i.e. the $L_{A90,T}$ level measured in the absence of plant items) to the rating level ($L_{Ar,T}$) of the various plant items, when operational. Where sound emissions are found to be tonal, impulsive, intermitent or to have other sound characteristics that are readily distinctive against the residual acoustic environment, BS4142 advises that penalties be applied to the specific level to arrive at the rating level.

9.34 The subjective method for applying a penalty for tonal sound characteristics outlined in BS 4142 recommends the application of a 2dB penalty for a tone which is just perceptible at the receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible. In relation to intermittency, BS 4142 recommends that if the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied. The following definitions as discussed in BS 4142 are summarised below:

"*ambient sound level,* $L_{Aeq,T}$" equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at any given time, usually from many sources near and far, at the assessment location over a given time interval, T.

"*residual sound level,* $L_{Aeq,T}$" equivalent continuous A-weighted sound pressure level of the residual sound (i.e. ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound) at the assessment location over a given time interval, T.

"*specific sound level,* $L_{Aeq,T}$" equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr.

"*rating level,* $L_{Ar,T}$" specific sound level plus any adjustment for the characteristic features of the sound.

"*background sound level,* $L_{A90,T}$" A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.

9.35 In order to establish an initial estimate of impact, BS 4142 states the following:

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level from the rating level, and consider the following:

- *Typically, the greater this difference, the greater the magnitude of the impact.*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*

- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*

- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

- *Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.*

9.36 The assessment methodology described above (i.e. comparison of rated sound level to background sound level) is quoted in BS4142 as representing a methodology to 'obtain an initial estimate' of impact. It is important to note that BS4142 also comments that 'Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration'. BS4142 provides a list of potential pertinent factors that can influence the 'initial estimate'. The plant noise assessment conducted in the following sections has been carried out with consideration of the guidance contained in BS4142 as summarised above.

9.37 The average night-time background noise level identified in the vicinity of noise sensitive locations which are proximate to the proposed development, are as outlined in Table 9.8.

Table 9.23 Measured Background Levels & Target Design Criteria

Location	Period	Average Background Noise Level dB L_{AF90} (Measured)	Target Criterion dB $L_{Aeq,15min}$
U1	Daytime (07:00 to 19:00hrs)	47	45
	Evening (19:00 to 23:00hrs)	45	45
	Night (23:00 to 07:00hrs)	37	37
U2	Daytime (07:00 to 19:00hrs)	46	45
	Evening (19:00 to 23:00hrs)	45	45
	Night (23:00 to 07:00hrs)	38	38

9.38 Based on the review it is proposed that the design criterion of typically 45dB $L_{Aeq,15min}$ during daytime and evening periods and 40dB $L_{Aeq,15min}$ during night-time be adopted at the façades of nearby residential properties. The night-time criterion will dictate the design of the development from an acoustic perspective so this will be focused on in this assessment as compliance with the night time criterion infers compliance with that of the daytime. This criterion is considered to be approximately equivalent to the lower existing background noise level measured during night-time periods at nearby residential properties and adverse impacts would not be considered likely should noise emissions be controlled to this level. Considering the L_{AF90} levels measured during the surveys it is considered that the above represents a robust design criterion.

9.39 In addition, typical planning conditions applied to developments of this nature by the relevant planning authority in terms of noise would state the following:

> *"Noise due to the normal operation of the proposed development, at the façade of a noise sensitive location, shall not exceed the daytime background level by more than 10dB(A) and shall not exceed the background level for evening and night time."*

9.40 It is considered the approach outlined in this section result in an adopted operational noise criterion that complies with the intent of the typical local authority planning condition for developments of this nature.

Amenity Areas

9.41 Guidance on appropriate noise criteria for outdoor amenities can be found in the UK document *Professional Guidance on Planning & Noise* (ProPG). The document is generally intended to provide guidance on amenity areas within residential developments, but it is considered to provide useful guidance on acceptable outdoor noise levels in amenity areas such as the Newcastle Golf Club which lies to the west and south west of the proposed development. The following advice with regards to external noise levels for amenity areas in the development:

> *"The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$."*

9.42 Thus noise levels due to the proposed development below the 55 dB(A) within the golf amenity are considered acceptable.

Summary

9.43 Based on the considerations outlined above, the following noise limits are proposed for this assessment:

- Day to Day Daytime 07:00 – 19:00hrs 45 dB $L_{Aeq,15min}$
Evening 19:00 – 23:00hrs 45 dB $L_{Aeq,15min}$
Night time 23:00 – 07:00hrs 37 dB $L_{Aeq,15min}$

- Emergency Daytime 07:00 – 19:00hrs 55 dB $L_{Aeq,15min}$
Evening 19:00 – 23:00hrs 55 dB $L_{Aeq,15min}$
Night time 23:00 – 07:00hrs 55 dB $L_{Aeq,15min}$

- Tonal and impulsive noise not permitted at noise sensitive locations.

Assessment of Significance

9.44 The '*Guidelines for Environmental Noise Impact Assessment*' produced by the Institute of Environmental Management and Assessment (IEMA) (2014) have been referenced in relation to the potential impact of changes in the ambient noise levels during the construction and the operational phases of the proposed development.

9.45 The guidelines state that for any assessment, the potential significance should be determined by the assessor, based upon the specific evidence and likely subjective response to noise. Due to varying factors which effect human response to environmental noise (prevailing environment, noise characteristics, time periods, duration and level etc.) assigning a subjective response must take account of these factors.

9.46 The scale adopted in this assessment is shown in Table 9.9 below is based on an example scale within the IEMA guidelines. The corresponding significance of impact presented in the Draft '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*' (EPA, 2017) is also presented.

Table 9.24 Noise Impact Scale

Noise Level Change dB(A)	**Subjective Response**	**Long Term Impact Classification (IEMA, 2014)**	**Impact Guidelines on the Information to be contained in EIA Report's (EPA)**
< 0	No change	Negligible	Imperceptible
≥ 0 and < 3	Barely perceptible		Not Significant
≥ 3 and < 5	Noticeable	Minor	Slight – Moderate
≥ 5 and < 10	Up to a doubling or halving of loudness	Moderate	Moderate – Significant
≥10	More than a doubling or halving of loudness	Major	Significant – Profound

9.47 The significance table reflects the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10 dB(A) change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level.

9.48 It is considered that the criteria specified in the above table provide a good indication as to the likely significance of changes on noise levels in this case and have been used to assess the impact of operational noise.

Operational Phase – Vibration Guidance

9.49 Guidance as to an acceptable magnitude of vibration during the operational phase of the development is best taken from British Standard *BS 6472 (1992): Guide to Evaluation of human exposure to vibration in buildings (1Hz to 80Hz).* The Standard contains recommendations that continuous vibration in residential buildings should not exceed nominally 0.3mm/s by daytime and 0.2mm/s by night-time.

9.50 It should be noted that the proposed development will not give rise to any significant levels of vibration off site and therefore the associated impact is not significant.

Forecasting Methods

9.51 Construction noise calculations have been conducted generally in accordance with BS 5228: 2009+A1:2014: *Code of practice for noise control on construction and open sites - Noise.* Prediction calculations for operational building services noise, car park activity and vehicle movements on site have been conducted generally in accordance with ISO 9613 (1996): *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation.* Changes in road traffic noise on the local road network have been considered using prediction guidance contained within *Calculation of Road Traffic Noise (CRTN)* issued by the Department of Transport in 1988.

Receiving environment

9.52 An environmental noise survey was conducted in order to quantify the existing noise environment. The survey was conducted in general accordance with ISO 1996-2:2017 Acoustics - Description, Measurement and Assessment of Environmental Noise - Determination of Sound Pressure Levels. Specific details are set out below.

Noise Survey Locations

9.53 Figure 9.2 illustrates the two locations in the vicinity of the site for noise measurements proposed development site at which noise monitoring was undertaken as part of the current assessment.

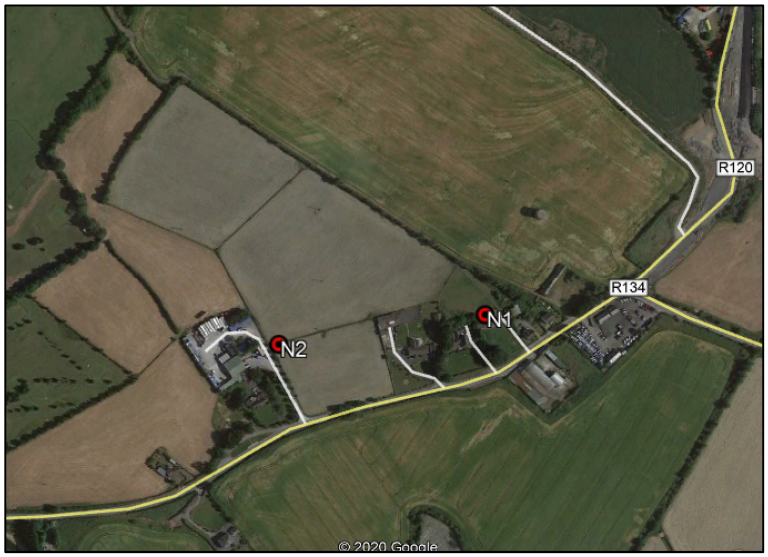

Figure 9.2 Noise Monitoring Locations

9.54 Noise measurements were conducted at two positions on the site that are representative of noise levels at the nearest noise sensitive receptors. Details for the particular locations are outlined below.

Location N1 located to the south-east of the site in line with the rear facades of neighbouring houses.

Location N2 Located at the south-west boundary at a location representing the noise environment of a nearby neighbouring house.

9.55 These locations are shown in the following figures:

Figure 9.3 Noise Measurement Location N1

Figure 9.4 Noise Measurement Location N2

9.56 Background noise levels (e.g. $L_{A90,T}$) at the various locations were typically dictated by local and distant road traffic noise. These levels fell as would be expected into the early hours of the morning when the volume of traffic on the local and wider road network reduced.

Survey periods

9.57 Unattended noise measurements were conducted between 10:00hrs on Tuesday 12 November and 10:00 Monday 18 November 2019. Attended noise measurements were carried out on Friday 15th November 2019 between 14:00hrs and 16:00hrs.

9.58 The weather during the survey period was dry with varying cloud cover. Wind speeds were moderate; however, they were not considered to have had a detrimental effect on the noise measurements.

Survey results

9.59 Table 9.10 outlines the average $L_{Aeq,15min}$ and $L_{A90,15min}$ levels measured at the survey locations over the duration of the survey period for day, evening and night time periods.

Table 9.25 Summary of Unattended Noise Measurements

Location / Period		Measured Noise Levels (dB re. $2x10^{-5}$ Pa)	
		Average $L_{Aeq,15min}$	Average $L_{A90,15min}$
U1	Daytime (07:00 to 19:00hrs)	64	47
	Evening (19:00 to 23:00hrs)	62	45
	Night (23:00 to 07:00hrs)	59	38
U2	Daytime (07:00 to 19:00hrs)	52	46
	Evening (19:00 to 23:00hrs)	52	45
	Night (23:00 to 07:00hrs)	47	38

Location U1 Average ambient noise levels were the order of 64, 62 and 59 dB $L_{Aeq,15min}$ during daytime, evening and night-time periods respectively.

Average background noise levels were the order of 47, 45 and 38 dB $L_{A90,15min}$ during daytime, evening and night-time periods respectively.

Location U2 Average ambient noise levels were the order of 52, 52 and 47 dB $L_{Aeq,15min}$ during daytime, evening and night-time periods respectively.

Average background noise levels were the order of 46, 45 and 38 dB $L_{A90,15min}$ during daytime, evening and night-time periods respectively.

Characteristics of the Proposed Development

9.60 The proposed development will comprise the development of a 110kV GIS substation and two 110kV transmission lines to be constructed over a c. 2 year period. When considering a development of this nature, the potential noise and vibration impact on the surroundings must be considered for each of two distinct stages – Construction and Operational.

9.61 In terms of the construction phase, a variety of items of plant will be in use: there will be vehicular movements to and from the site that will make use of existing roads. Due to the nature of these activities, there is potential for generation of high levels of noise. The underground cables will be laid along a strip of land to the existing Castlebaggot-Kilmahud Circuit to the east using a methodology similar to the one detailed below:

- The area where excavations are planned will be surveyed, prior to the commencement of works, with a cable avoiding tool and all existing underground services will be identified;

- A team consisting of a rubber tracked excavator, a dumper and a tractor and stone cart with side-shoot will dig the trench for and lay approximately 120m of the underground cabling per day;
- The excavators will open a trench, the trench will be a maximum of 600mm wide;
- Clay plugs will be installed at 50m intervals to prevent the trench becoming a conduit for surface water runoff;
- The excavated material will be loaded into the dumpers to be transported to a designated temporary stockpiling area to be reused as backfilling material where appropriate;
- Once the trench has been excavated, a base layer of blinding will be installed by the tractor and cart and compacted by the excavators;
- The ducting will then be placed in the trench as per relevant specifications;
- Blinding will be installed above the cable ducting and compacted.
- The remainder of the trench will be backfilled with granular material and compacted, and;
- The trench will be reinstated as per existing surfacing i.e. landscaped in greenfield area where appropriate.

9.62 Construction activities will mostly be carried out during normal daytime working hours. Normal construction hours will be specified by planning conditions of a grant of permission for the Proposed Development, or by the local authority.

9.63 Once operational, there will be no significant off-site noise emissions from the operation of the cable installations or 110kV substations and associated cable bays. The principal potential noise source which requires assessment is the set of three transformers, located to the northwest of the ICT facility buildings.

9.64 These issues are discussed in detailed in the following sections.

Potential impacts of the Proposed Development

9.65 Figure 9.5 highlights the nearest noise sensitive receptors located adjacent the proposed development. The receptors comprise residential dwellings and an amenity, Newcastle Golf Club.

Construction phase

9.66 It is predicted that the construction programme will create typical construction activity related noise on site. During the construction phase of the proposed development, a variety of items of plant will be in use, such as excavators, lifting equipment, dumper trucks, compressors and generators.

9.67 The proposed general construction hours are 07:00 to 18:00hrs, Monday to Friday and 08:00 to 14:00hrs on Saturdays. Occasional weekday and evening works may also be required, however evening activities will be significantly reduced in order to manage any associated noise impacts in an appropriate manner and a more stringent construction noise criteria (as per Table 9.5) will be applicable during any evening works that may be required. As a result, noise emissions from evening activities are expected to be significantly lower than for other general daytime activities.

9.68 Due to the nature of daytime activities undertaken on a construction site of this nature, there is potential for generation of significant levels of noise. The flow of vehicular traffic to and from a construction site is also a potential source of relatively high noise levels. The potential for vibration at neighbouring sensitive locations during construction is typically limited to excavation works and lorry movements on uneven road surfaces. Due to the distances from sensitive locations to site works however, there is little likelihood of structural or even cosmetic damage to existing neighbouring dwellings as a result of vibration.

9.69 As the construction programme has been established in outline form only, it is difficult to calculate the actual magnitude of noise emissions to the local environment. However, it is possible to predict typical noise levels using guidance set out in BS 5228-1. Table 9.11 outlines typical plant items and associated noise levels that are anticipated for various phases of the construction programme.

9.70 For the purposes of the assessment we have assumed that standard good practice measures for the control of noise from construction sites will be implemented. These issues are commented upon in further detail in the mitigation section of this report.

Table 9.11 Indicative Noise Levels from Construction Plant at Various Distances from the cable installation Works

Item (BS 5228 Ref.)	Highest Predicted Noise Level at Stated Distance from Edge of Works (dB $L_{Aeq,1hr}$)			
	20m	40m	60m	100m
Pneumatic breaker (C.8.12)	66	60	56	52
Wheeled loader (C.3.51)*	62	56	52	48
Tracked excavator (C.3.43)*	63	57	53	49
Dozer (C.3.30)*	64	58	54	50
Dump truck (C.3.60)*	60	54	50	46
Asphalt Spread (C.8.24)	70	64	60	56
Compressor (C.7.27)	61	55	51	47
Road Roller (C.3.114)	65	59	55	51
HGV Movements (10 per hour)	53	50	49	46

9.71 Construction works associated with cable works will be the dominant source of noise at the nearest noise sensitive locations when they occur. Other construction activity from the proposed development, is at sufficient distance from a significant proportion of the proposed cable works, so that when they occur at the same time, cumulative issues would not be a material issue.

9.72 The noise levels presented in Table 9.11 are within the weekday daytime construction noise limit values shown in Table 9.5, at distances of 40m or greater from the works. Where works are taking place at 20m or less from noise-sensitive properties, there is the potential for a significant effect to occur. This is only likely at NSL3 and NSL4 and as the works will progress along the route, the effect with by temporary in nature. The section of works along the road by locations NSL3 and NSL4 is expected to last just one-two weeks.

Figure 9.5 Noise Sensitive Locations Considered for Assessment

9.73 Considering the typical distance from works to noise sensitive locations, it is expected that the day and evening criteria for construction noise outlined here can be satisfied. Additional measures will need to be considered during periods where works are carried out during night-time periods to ensure night-time criterion are not exceeded. Specifically, high impact activities will not be permitted during night-time hours. Various measures that can be considered are outlined in the mitigation section of this chapter.

9.74 In terms of noise associated with the construction activities for the proposed development the associated effect is stated to be negative and minor at the majority of locations. At NSL3 and NSL4, the overall effect of construction noise is considered moderate as the duration is temporary.

9.75 It is anticipated that the construction of the facility will be completed during normal construction hours i.e. 07:00 to 18:00hrs Monday to Friday and 08:00 to 14:00hrs on Saturdays. However, it is possible that the contractor may wish to carry out certain operations outside these hours i.e. evening hours during long summer days etc. Such occurrences will be kept to a minimum and take place over a short timeframe and as such are unlikely to cause excessive disturbance. A more stringent construction noise criteria (as per Table 9.6) will be applicable during any evening works that may be required.

9.76 In the unlikely event that works are scheduled out of normal hours or at night, the range of calculated noise levels are also below a level that would lead to a significant impact. Given, however, the potential for cumulative noise impacts to occur if multiple items of plant operate at the same time, noise mitigation measures will need to be considered during these periods. As noted above, however, it is not anticipated that any works will be carried out at night-time. Various measures relating to the control of noise from the works are outlined in the mitigation section of this assessment.

9.77 The predicted external construction noise levels for the site preparation phase are within the relevant noise criterion of 65 dB $L_{Aeq,12hr}$ over the construction noise at all locations at distances of 40m or greater, subject to the implementation of the mitigation measures outlined in this chapter. A significant effect is therefore not predicted in relation to these noise sensitive locations at these distances in terms of this aspect of potential construction noise.

9.78 Noise levels for the remaining phases are within the 'significance' thresholds presented in the British Standard BS 5228 – 1: 2009+A1:2014: *Code of practice for noise and vibration control on construction and open sites – Noise* therefore there is not a significant impact at residential locations, subject to the implementation of the mitigation measures outlined in this chapter.

9.79 There is no item of plant that would be expected to give rise to noise levels that would be considered out of the ordinary or in exceedance of the levels outlined. The impact on the noise environment due to construction activities will be transient in nature and mitigation measures will be implemented to minimise the impact of construction activities on the noise environment.

Construction Traffic

9.80 In terms of the additional construction traffic on local roads that will be generated as a result of the proposed development the following comment is presented: Given that in order to increase traffic noise levels by 1dB, traffic volumes would need to increase by the order of 25%, it is considered that additional traffic introduced onto the local road network due to the construction of the various phases of the development, as outlined in the relevant sections of Chapter 12, will not result in a significant noise impact

Review of Construction Impacts

9.81 In terms of noise associated with these construction activities the associated effect is stated to be:

Quality	***Significance***	***Duration***
Negative	*Minor*	*Short Term*

9.82 In terms of vibration due to the distance of activities from the site to the nearest sensitive locations and controlling vibration levels to those detailed in Table 9.7 the associated effect is stated to be

Quality	***Significance***	***Duration***
Neutral	*Imperceptible*	*Medium Term*

Operational phase

9.83 The primary sources of outward noise in the operational context are the three transformers. These issues are discussed in detailed in the following sections. See Appendices 9.2, 9.3 and 9.4 for details of the noise modelling undertaken for this assessment and associated assumptions.

Building Services Noise / Emergency Site Operation

9.84 As stated towards the start of this chapter, there are two adjacent developments, one, the PGF that is in receipt of permission, and another the ICT facility that is subject to an Additional Information request from the Planning Authority. A full noise assessment was submitted with each application, both individually as part of the PGF application and collectively as part of an EIAR with the ICT facility application. Worst-case noise impacts were described as being not significant.

9.85 In respect of the current application, the following extract from the "*EirGrid Evidence Based Environmental Studies Study 8: Noise – Literature review and evidence based field study on the noise effects of high voltage transmission development (May 2016)*" states the following in relation to noise impacts associated with 110KvA transformer installations:

> *"The survey on the 110kV substation at Dunfirth indicated that measured noise levels (L_{Aeq}) were less than 40dB(A) at 5m from each of the boundaries of the substation. This is below the WHO night-time free-field threshold limit of 42dB for preventing effects on sleep and well below the WHO daytime threshold limits for serious and moderate annoyance in outdoor living areas (i.e. 55dB and 50dB respectively). Spectral analysis of the data recorded at this site demonstrated that there were no distinct tonal elements to the recorded noise level. To avoid any noise impacts from 110kV substations at sensitive receptors, it is recommended that a minimum distance of 5m is maintained between 110kV substations and the land boundary of any noise sensitive property."*

9.86 Assuming the proposed substation installation has comparable noise emissions to the 110kV unit discussed above and considering the distance between the 110kV substation and the nearest off site locations (i.e. >100m) noise from this aspect installation is not predicted to be an issue off site.

9.87 The only noise potentially generating item in the current application (for the Gas Insulated Switchgear (GIS) substation compound and Transformers / MV switch room compound along with associated and ancillary works) is the set of three transformers located to the northwest of the proposed ICT facility building, as shown in Figure 9.6. Each bay is surrounded by a 6.5m high wall on three sides.

9.88 In the assessment of noise impact from the current application, the approach taken is to consider the cumulative noise impact of the Power Generation Facility, the ICT facility and the transformers in the current application, all acting together.

9.89 Sound power levels of each transformer unit are assumed to be similar to those which formed part of the Power Generation Facility, details of which are presented in Appendix 9.4. The predicted noise levels of the three transformers acting alone are presented in Table 9.12.

Table 9.26 Predicted Plant Noise Levels due to transformers only

Location	Height (m)	Predicted dB $L_{Aeq,T}$
		Transformers Only
NSL1	2.0	<20
NSL2	4.0	<20
NSL3	2.0	<20
NSL4	2.0	<20
NSL5	4.0	20
NSL6	2.0	<20

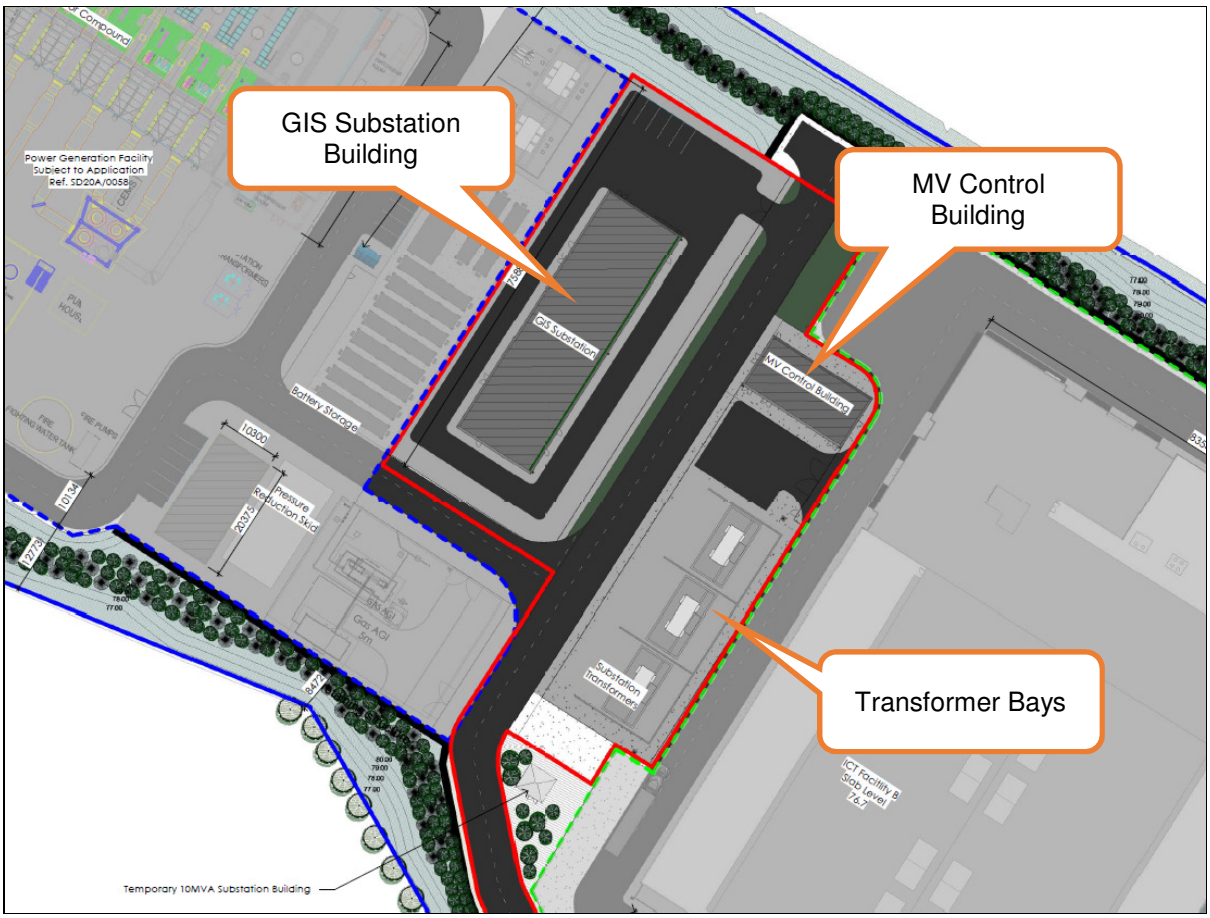

Figure 9.6 Layout of the substation compound within the current application

9.90 The predicted noise levels are such that the noise due to the current application is imperceptible at noise-sensitive properties and have will have no effect of the cumulative overall noise levels as prepared and submitted in the cumulative assessment for the Power Generation Facility and the ICT facility.

9.91 In respect of the Power Generation Facility and the ICT facility, four scenarios were developed to consider the noise impact of the proposed operations, as follows:

- Scenario A – Proposed Data storage facility – Normal Operation – Day/Evening
- Scenario B – Proposed Data storage facility – Normal Operation – Night
- Scenario C – Proposed Data storage facility – Emergency
- Scenario D – Proposed Data storage facility – Generator Testing

9.92 Scenarios A and B would be considered to be the most representative of normal operation during daytime and evening periods respectively. Scenario C is representative of emergency situation when a power outage or issue with supply from the national grid has occurred. It should be noted that such an event is an extremely rare occurrence.

9.93 Scenario D considers the impact associated with the occasional testing of proposed back-up generators on the site. Typically, five generator units will be tested at any one time. The assessment presented here assumes the closest generator to existing noise sensitive locations are running when presenting expected noise levels associated with the generator testing.

9.94 Figure 9.7 highlights the nearest noise sensitive locations at which predictions have been carried out. Various noise contours are also presented for scenarios A, B, C and D in order to demonstrate the noise impact of the proposed development over a wider area. The results of the iterations of the noise model are presented in Table 9.13. Note all plant will be selected such that no tonal noise emissions are evident at noise sensitive locations. It is confirmed that these noise levels are cumulative values, i.e. they include the noise due to the power generation facility, which is the subject of a separate planning application within the same site.

Table 9.27 Predicted Plant Noise Levels for Various Scenarios

cation	eriod	Scenario A & B			Scenario C			Scenario D		
		Predicted dB $L_{Aeq,T}$	Criterion dB $L_{Aeq,T}$	Complies ?	Predicted dB $L_{Aeq,T}$	Criterion dB $L_{Aeq,T}$	Complies ?	Predicted dB $L_{Aeq,T}$	Criterion dB $L_{Aeq,T}$	Complies ?
NSL1	Day	38	45	✓	41	50	✓	39	55	✓
	Evening		45	✓			✓	--	--	--
	Night	34	37	✓			✓	--	--	--
NSL2	Day	39	45	✓	44		✓	41	55	✓
	Evening		45	✓			✓	--	--	--
	Night	37	37	✓			✓	--	--	--
NSL3	Day	40	45	✓	46		✓	39	55	✓
	Evening		45	✓			✓	--	--	--
	Night	33	37	✓			✓	--	--	--
NSL4	Day	39	45	✓	47		✓	41	55	✓
	Evening		45	✓			✓	--	--	--
	Night	33	37	✓			✓	--	--	--
NSL5	Day	38	45	✓	41		✓	38	55	✓
	Evening		45	✓			✓	--	--	--
	Night	34	37	✓			✓	--	--	--
NSL6	Day	39	45	✓	43		✓	40	55	✓
	Evening		45	✓			✓	--	--	--
	Night	33	37	✓			✓	--	--	--

9.95 The above predicted levels are based on a situation where the receiver is downwind of all noise sources. For the purposes of the assessment against the adopted criteria this is a robust worst-case assumption. Table 9.14 compares the predicted noise levels to the adopted criteria for Scenarios A, B, C and D. All cumulative noise levels are found to be within the criteria.

Table 9.28 Comparison of cumulative noise levels against day evening and night-time criteria for the various scenarios

Location	Height (m)	Predicted dB $L_{Aeq,T}$			
		Scenario A	Scenario B	Scenario C	Scenario D
		Day/Evening	Night	Emergency	Gen Test Day
NSL1	2.0	38	34	41	39
NSL2	4.0	39	37	44	41
NSL3	2.0	40	33	46	39
NSL4	2.0	39	33	47	41
NSL5	4.0	38	34	41	38
NSL6	2.0	39	33	43	40

Comment on Adopted Noise Criteria Day to Day Operations

9.96 The predicted noise levels presented in Table 9.14 have been compared to the relevant noise criteria as adopted for this assessment. It should be noted that the back-up generator testing shall take place only at times between 09.00 and 17.00hrs. Residents of the adjacent dwelling houses shall be provided with adequate prior warning of the proposed testing times where the testing is expected to exceed 1 hour in duration.

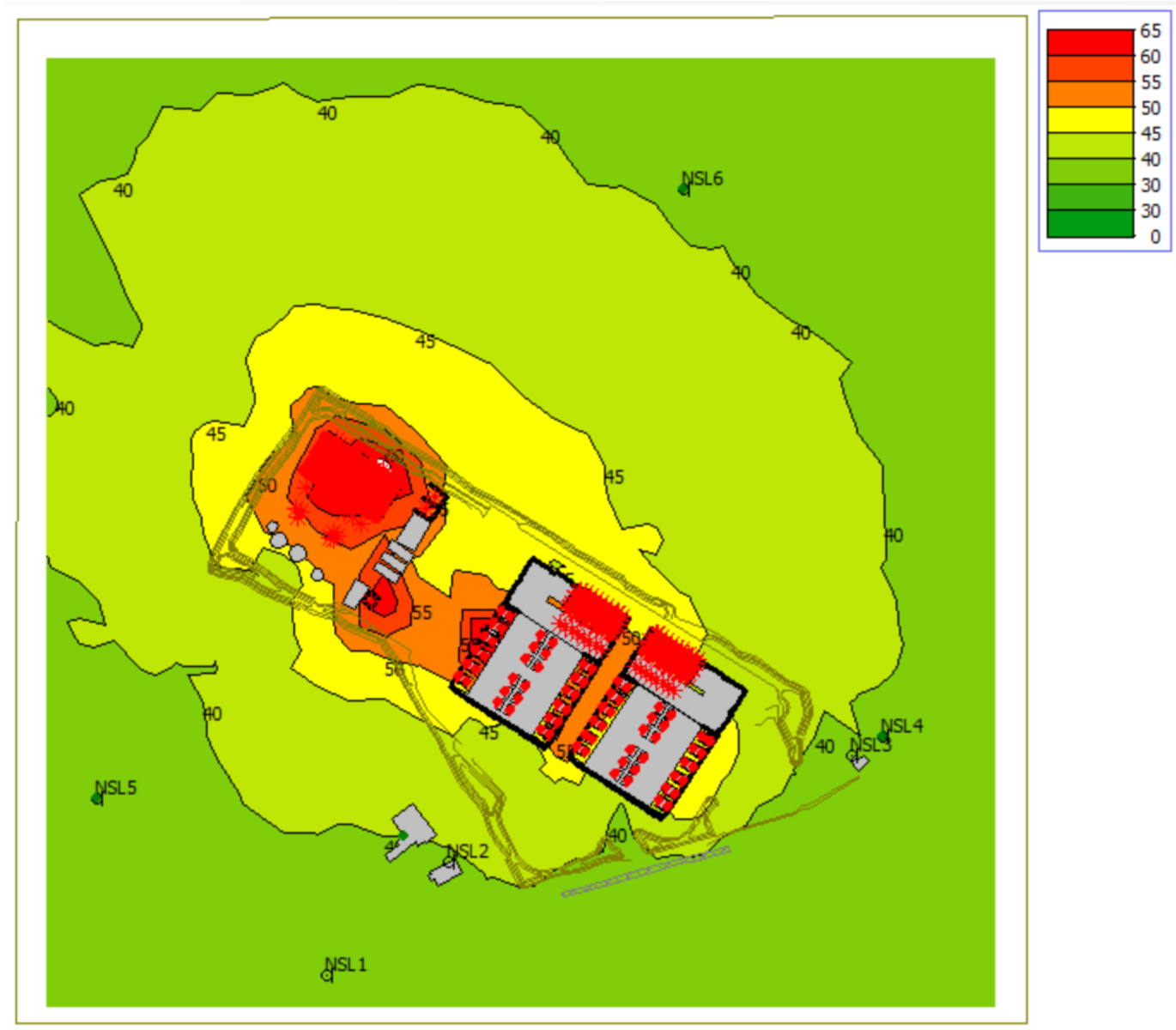

Figure 9.7 Scenario A – Proposed Data storage facility – Normal Operation (Day/Evening) Noise Contour

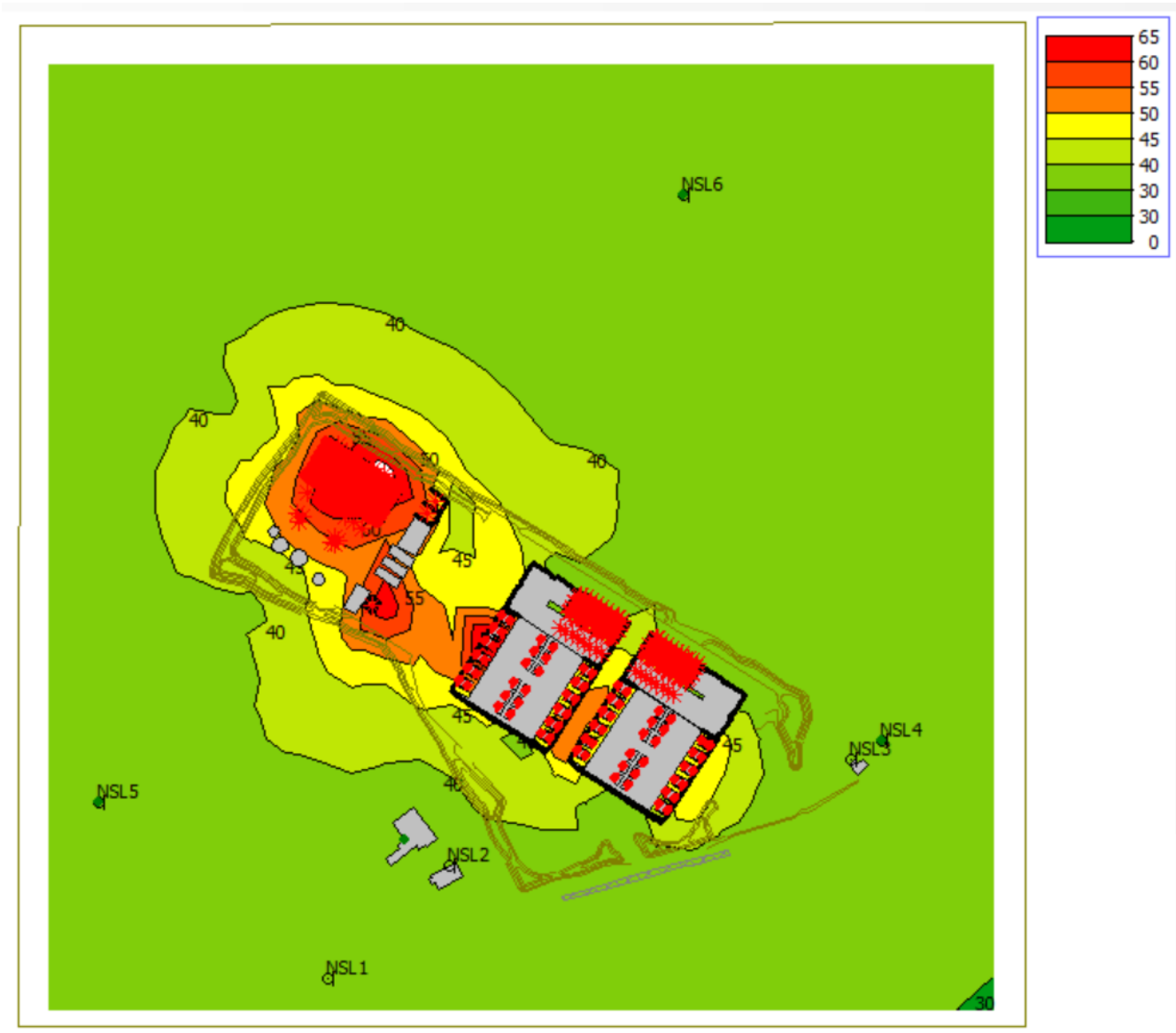

Figure 9.8 Scenario B – Proposed Data storage facility – Normal Operation (Night) Noise Contour

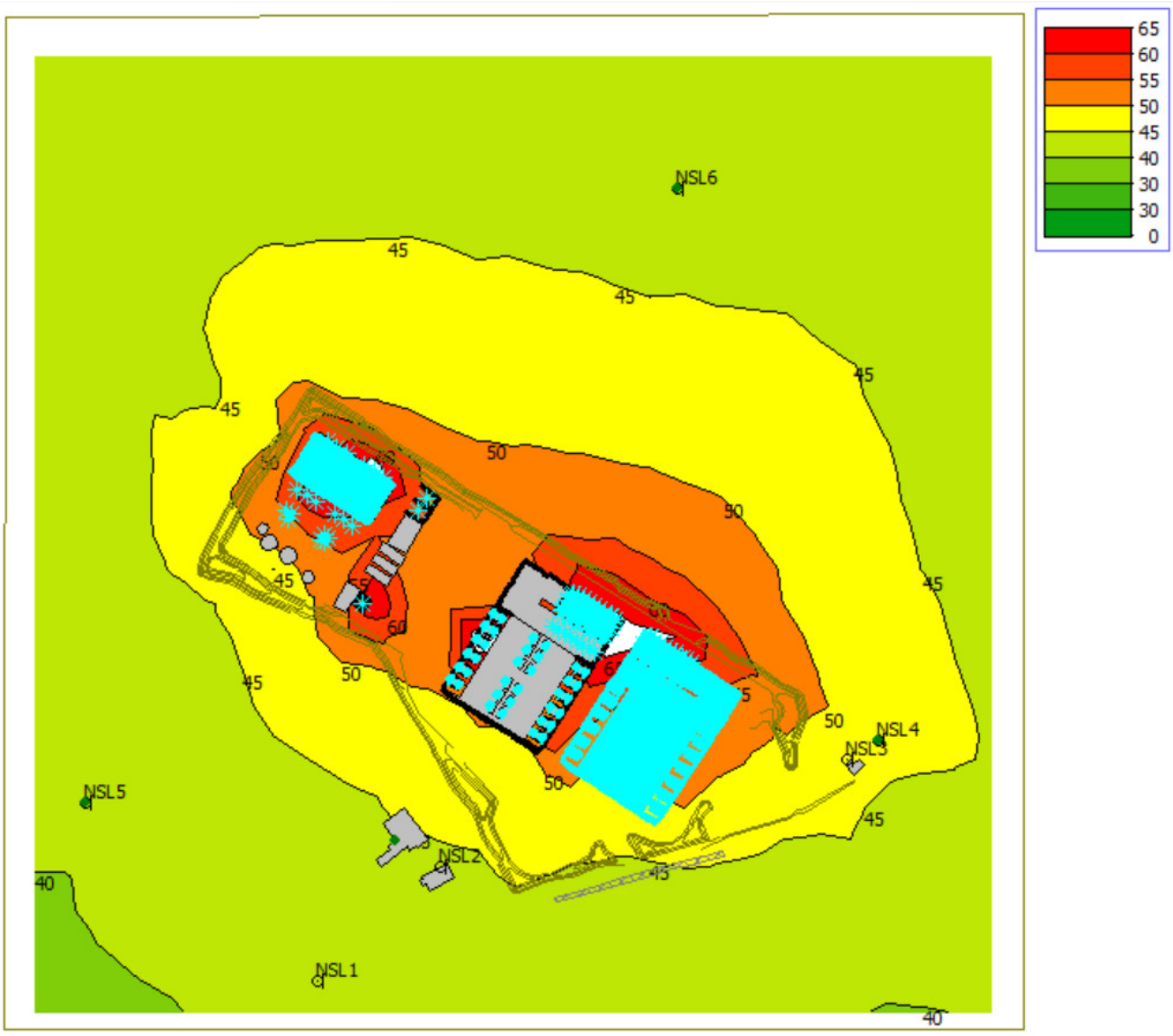

Figure 9.9 Scenario C – Proposed Data storage facility – Emergency Noise Contour

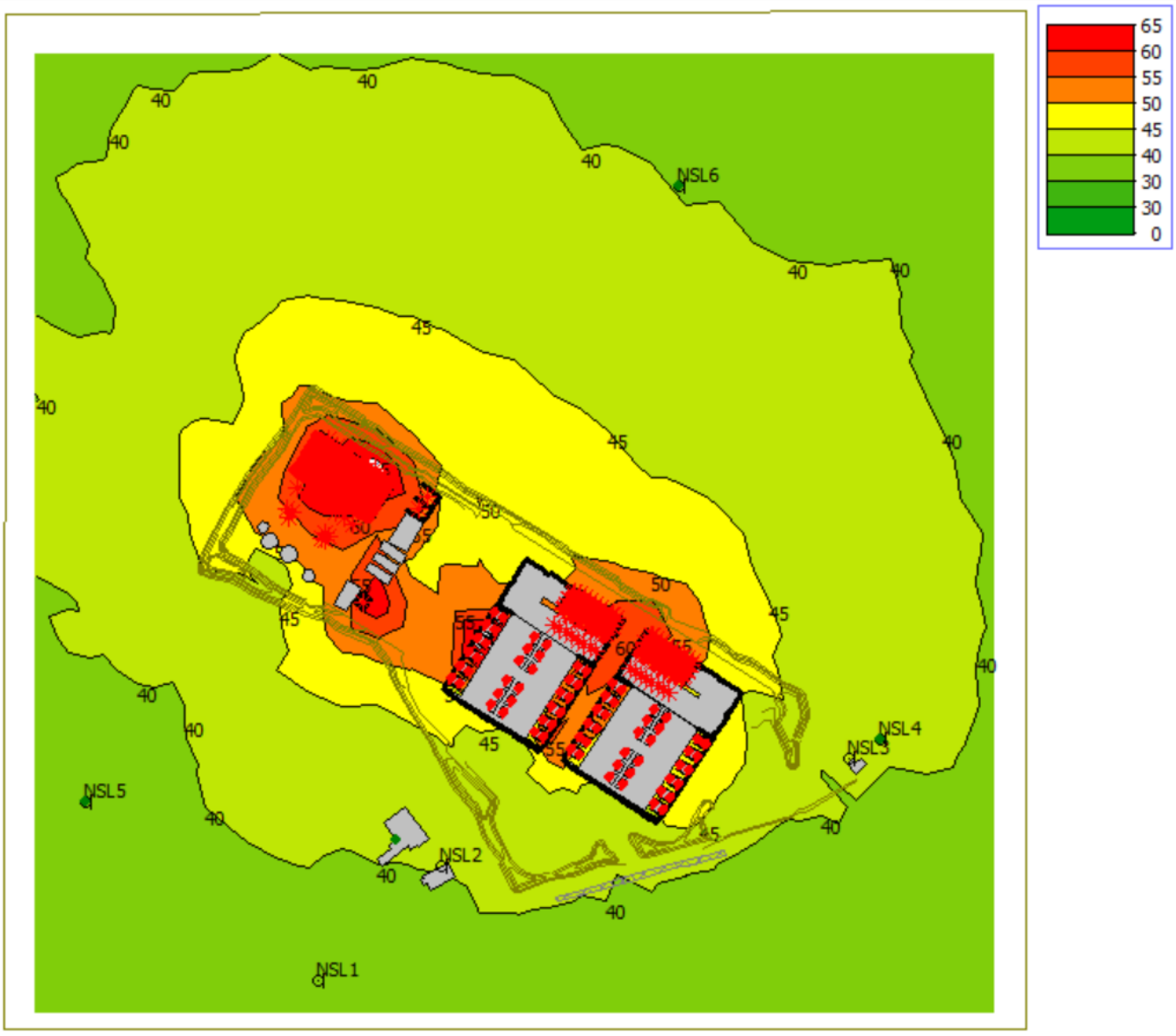

Figure 9.10 Scenario D – Proposed Data storage facility – Generator Testing Noise Contour

Scenario A/B All locations are within the relevant adopted daytime, evening and night-time limits. All locations comply with the adopted criteria in relation to day to day operations. Figure 9.8 presents a noise contour for Scenario A and Figure 9.8 presents a noise contour for Scenario B.

Scenario C All locations are within the relevant adopted emergency operation limit in the rare event that a power loss to the site occurs. Figure 9.9 presents a noise contour for Scenario C.

Scenario D All locations are within the relevant adopted daytime limits during periods when a set of generators is undergoing routine testing. Figure 9.10 presents a noise contour for Scenario D.

Comment noise levels within golf amenity

9.97 Figure 9.8 shows that the daytime 50 dB(A) contour is largely confined to the proposed development boundary, therefore the noise impact on the golf amenity is considered not significant.

Summary

9.98 Scenarios A and B would be representative of the typical day to day operations envisioned for the site during daytime, evening and night time periods. Review of the predicted noise levels and associated noise contours confirms that the site-specific levels comply with the noise criterion adopted for this assessment and are compliant with those typically espoused by the EPA.

9.99 Scenario C is representative of emergency situations such as a power outage on the national grid. Review of the predicted noise levels and associated noise contours confirm that the site-specific levels comply with the noise criterion that has been adopted for these situations following review of relevant guidance.

Review of Increases in Noise Level

9.100 Table 9.15, 9.16 and 9.17 present the predicted changes in noise level associated with the development at the nearest noise sensitive locations to the site.

Table 9.29 Review of Predicted Changes in Existing Noise Levels – Day

Loc.	Scenario A – Typical Operation Daytime				
	Predicted dB $L_{Aeq,T}$	**Background Level dB $L_{A90,T}$**	**Cumulative Noise Level (dB(A))**	**Change in Noise Level (dB)**	**EPA Glossary of Impacts**
NSL1	38	46	46.6	0.6	Not Significant
NSL2	39	46	46.8	0.8	Not Significant
NSL3	40	46	47.0	1.0	Not Significant
NSL4	39	46	46.8	0.8	Not Significant
NSL5	38	46	46.6	0.6	Not Significant
NSL6	39	46	46.8	0.8	Not Significant

Note A : Location USL01 assumed for Locations R01 to R07 and USL02 assumed for Locations R08 & R09

9.101 Review of the predicted increases in noise level at the nearest noise sensitive locations conclude that the associated impact is '*Imperceptible*' at all locations for Scenario A – Typical Operation daytime periods.

Table 9.30 Review of Predicted Changes in Existing Noise Levels – Evening

Loc.	Scenario A – Typical Operation Evening				
	Predicted dB $L_{Aeq,T}$	Background Level dB $L_{A90,T}$	Cumulative Noise Level (dB(A))	Change in Noise Level (dB)	EPA Glossary of Impacts
NSL1	38	45	45.8	0.8	Imperceptible
NSL2	39	45	46	1	Imperceptible
NSL3	40	45	46.2	1.2	Imperceptible
NSL4	39	45	46	1	Imperceptible
NSL5	38	45	45.8	0.8	Imperceptible
NSL6	39	45	46	1	Imperceptible

9.102 Review of the predicted increases in noise level at the nearest noise sensitive locations conclude that the associated impact is '*Imperceptible*' or '*Not Significant'* at all locations for Scenario A – Typical Operation evening periods.

Table 9.31 Review of Predicted Changes in Existing Noise Levels – Night

Loc.	Scenario A – Typical Operation Evening				
	Predicted dB $L_{Aeq,T}$	Background Level dB $L_{A90,T}$	Cumulative Noise Level (dB(A))	Change in Noise Level (dB)	EPA Glossary of Impacts
NSL1	34	37	38.8	1.8	Imperceptible
NSL2	37	37	40	3	Imperceptible
NSL3	33	37	38.5	1.5	Imperceptible
NSL4	33	37	38.5	1.5	Imperceptible
NSL5	34	37	38.8	1.8	Imperceptible
NSL6	33	37	38.5	1.5	Imperceptible

9.103 Review of the predicted increases in noise level at the nearest noise sensitive locations conclude that the associated impact is '*Imperceptible*' or '*Not Significant'* at all locations for Scenario B – Typical Operation night time periods.

9.104 In essence the existing soundscapes that are encountered at the nearest noise sensitive locations are predicted to remain unchanged in terms of ambient noise levels with the development of the data storage facility introducing a low level of plant noise which will increase the background noise environment.

9.105 In terms of noise associated with day to day activities the associated effect is stated to be as follows:

Quality	***Significance***	***Duration***
Negative	*Imperceptible to Not Significant*	*Long-term*

Additional Vehicular Traffic on Public Roads

9.106 In terms of the additional traffic on local roads that will be generated as a result of this development the following comment is presented: Given that in order to increase traffic noise levels by 1dB traffic volumes would need to increase by the order of 25% it is considered that additional traffic introduced onto the local road network due to this development will not result in a significant noise impact. The resultant noise impact is ***neutra****l,* ***imperceptible*** and ***long-term***.

Vibration

9.107 There is no source of vibration associated with the day to day operation of the development that will give rise to impacts at nearby sensitive locations. In terms of these the operational phase of the development the associated effect is stated to be:

Quality	***Significance***	***Duration***
Neutral	*Imperceptible*	*Long-term*

Remedial and mitigation measures

9.108 In order to sufficiently ameliorate the likely noise impact, a schedule of noise control measures has been formulated for both construction and operational phases associated with the proposed development.

Construction phase

9.109 With regard to construction activities, reference has been made to BS5228 Parts 1 and 2, which offer detailed guidance on the control of noise and vibration from demolition and construction activities. Various mitigation measures will be considered and applied during the construction of the proposed development. As an example, the following measures will be implemented on site:

- limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- establishing channels of communication between the contractor/developer, Local Authority and residents;
- appointing a site representative responsible for matters relating to noise and vibration;
- monitoring levels of noise and/or vibration during critical periods and at critical sensitive locations; and
- all site access roads will be kept even so as to mitigate the potential for vibration from lorries.

9.110 Furthermore, a variety of practicable noise control measures will be employed, such as:

- selection of plant with low inherent potential for generation of noise and/ or vibration;
- erection of barriers as necessary around items such as generators or high duty compressors;
- situate any noisy plant as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary.

9.111 It is recommended that vibration from construction activities to off-site residences be limited to the values set out in Table 9.7. It should be noted that these limits are not absolute but provide guidance as to magnitudes of vibration that are very unlikely to cause cosmetic damage. Magnitudes of vibration

slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Where there is existing damage, these limits may need to be reduced by up to 50%.

9.112 Appendix 9.5 presents an indicative construction noise and vibration management plan that will be implemented in terms of the day to day operation of the site. This will focus on opening up and maintaining lines of communication with the local community to address issues in relation to noise and/or vibration and to advise the community of periods where specific activities take place (e.g. rock breaking) that have an increased potential in giving rise to issues off site.

Operational phase

Building Services Noise / Emergency Site Operation

9.113 Once operational, there are no noise or vibration measures required. With due consideration as part of the detailed design process, this approach will result in the site operating well within the constraints of the best practice guidance noise limits that have been adopted as part of this detailed assessment.

Additional Vehicular Traffic on Public Roads

9.114 The noise impact assessment outlined previously has demonstrated that mitigation measures are not required.

Predicted impacts of the Proposed Development

9.115 This section summarises the likely noise and vibration impact associated with the proposed development, taking into account the mitigation measures.

Construction phase

9.116 During the construction phase of the proposed development there will be some impact on nearby noise sensitive properties due to noise emissions from construction site works. The application of noise limits 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. Also, it is reiterated that any construction noise impacts will be ***moderate, negative*** and ***short-term*** in nature. Also, it is considered that as the proposed development progresses from initial ground works that construction noise impacts will reduce from moderate to ***not significant.***

Operational phase

Building Services Noise / Emergency Site Operation

9.117 Proprietary noise and vibration control measures will be employed in order to ensure that noise emissions from building services plant do not exceed the adopted criterion at the façade of any nearby noise sensitive locations. In addition, noise emissions should be broadband in nature and should not contain any tonal or impulsive elements. The resultant noise impact is ***negative***, ***not significant*** and ***long-term***.

Additional Vehicular Traffic on Public Roads

9.118 Any change in noise levels associated with vehicles at road junctions in the vicinity of the proposed development is expected to be ***imperceptible.*** The resultant noise impact is ***neutral, imperceptible*** and ***long-term.***

Residual impacts

9.119 The construction noise assessment has shown that construction noise levels are below the criteria in the TII *Guidelines for the Treatment of Noise and Vibration in National Road Schemes,* subject to the implementation of the mitigation measures outlined above.

9.120 Moreover, once the site preparation phase is complete, the assessment has shown that in accordance with the 'significance' thresholds presented in the British Standard BS 5228 – 1: 2009+A1:2014: *Code of practice for noise and vibration control on construction and open sites – Noise,* there is not a

significant impact at residential locations, similarly subject to the mitigation measures outlined in this chapter.

9.121 The robust analysis of potential operational phase plant has shown that in accordance with the scale in the EPA Draft EIA Report Guidelines 2017 there will be a ***moderate, negative, long-term*** impact at the closest residences identified on Figure 9.5.

9.122 The operational noise assessment of vehicle movements associated with the site has shown that in accordance with the scale in the EPA Draft EIA Report Guidelines 2017 there will be an ***imperceptible, neutral, long-term*** impact off site noise sensitive locations considering existing traffic volumes on the local road network.

Cumulative impacts

9.123 The cumulative impact of the proposed development with any/all relevant other planned or permitted developments are discussed below for construction and operational phases. In particular, the power generation facility proposed under SDCC Reg. Ref. SD20A/0058 and the ICT facility applied for under SDCC Reg. Ref. SD20A/0324 are considered.

9.124 The environmental noise survey takes account of noise emissions from existing developments. It was noted that the existing ambient noise levels in the area were dominated primarily by road traffic on the surrounding road network.

Construction phase

9.125 As the site is developed, there is the potential for the construction phases of the power generation facility, ICT facility (if granted) and the proposed development to overlap. The additional distances to the closest noise-sensitive locations NSL3 and NSL4 in relation to the PGF that will be constructed first will result in lower noise levels from the construction of the power generation facility at these locations, when compared to the noise levels presented in Table 9.2.

9.126 Once the mitigation measures outlined for construction phases of the proposed development are implemented, the cumulative impact associated with the construction of the proposed development and the PGF and ICT facility (if granted) remains ***negative*** and ***moderate*** i.e. as assessed for the proposed development itself. Also, it is considered that as the proposed development progresses from site preparation that construction noise impacts (and similarly the cumulative impacts including surrounding developments) will reduce from moderate to ***not significant.***

Operational phase

9.127 In terms of the site, a planning permission has been granted for a PGF under SDCC Reg. Ref. SD20A/0058. The original noise assessment for that part of the site and a further report supporting a response to a Request for Further Information was also prepared by AWN Consulting and is included in the noise model for this application. The noise assessment for the ICT facility was also prepared by AWN Consulting, and whilst the decision remains pending, it has also been included within the noise model for this application.

9.128 The overall cumulative impact is therefore considered to be as determined for the proposed development i.e. ***moderate***, ***negative***, and ***long-term***.

10. AIR QUALITY AND CLIMATE

Introduction

10.1 This chapter evaluates the impacts which the Proposed Development may have on Air Quality & Climate as defined in the Environmental Protection Agency (EPA) documents Draft 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2017) and the EPA Draft 'Advice Notes for Preparing Environmental Impact Statements' (2015).

10.2 The proposed development primarily comprises the provision of two no. 110kV transmission lines and a 110kV Gas Insulated Switchgear (GIS) substation compound and Transformers / MV switch room compound along with associated and ancillary works. These works are described in detail within Chapter 2 (Description of the Proposed Development) of this EIAR.

Methodology

Criteria for Rating of Impacts

Ambient Air Quality Standards

10.3 In order to reduce the risk to health from poor air quality, National and European statutory bodies, the Department of the Environment, Heritage and Local Government in Ireland and the European Parliament and Council of the European Union, have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Table 10.1).

10.4 Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporate European Commission Directive 2008/50/EC which has set limit values for a number of pollutants with the limit values for NO_2, PM_{10}, and $PM_{2.5}$ being relevant to this assessment. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC).

Table 10.1 Ambient Air Quality Standards

Pollutant	Regulation [Note 1]	Limit Type	Value
Dust Deposition	TA Luft (German VDI 2002)	Annual average limit for nuisance dust	350 mg/(m^2*day)
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m^3
		Annual limit for protection of human health	40 µg/m^3
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m^3 PM_{10}
		Annual limit for protection of human health	40 µg/m^3 PM_{10}
Particulate Matter (as $PM_{2.5}$)	2008/50/EC	Annual limit for protection of human health	25 µg/m^3 $PM_{2.5}$

Note 1 EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

Dust Deposition Guidelines

10.5 The concern from a health perspective is focused on particles of dust which are less than 10 microns and the EU ambient air quality standards outlined above have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

10.6 With regard to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland.

10.7 However, guidelines for dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/(m^2*day) averaged over a one year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled 'Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (EPA, 2006). The document recommends that the Bergerhoff limit of 350 mg/(m^2*day) be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the Proposed Development.

Climate Agreements

10.8 Ireland is party to both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The Paris Agreement, which entered into force in 2016, is an important milestone in terms of international climate change agreements and includes an aim of limiting global temperature increases to no more than 2°C above pre-industrial levels with efforts to limit this rise to 1.5°C. The aim is to limit global GHG emissions to 40 gigatonnes as soon as possible whilst acknowledging that peaking of GHG emissions will take longer for developing countries. Contributions to GHG emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant progress was also made in the Paris Agreement on elevating adaption onto the same level as action to cut and curb emissions.

10.9 In order to meet the commitments under the Paris Agreement, the EU enacted Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013 (the Regulation). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. Ireland's obligation under the Regulation is a 30% reduction in non-ETS greenhouse gas emissions by 2030 relative to its 2005 levels.

10.10 In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the Act). The purpose of the Act was to enable Ireland 'to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050' (3.(1) of No. 46 of 2015). This is referred to in the Act as the 'national transition objective'. The Act makes provision for a national mitigation plan, and a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

10.11 The Climate Action Plan (CAP) (Government of Ireland, 2019), published in June 2019, outlines the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlines the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The CAP also details the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The CAP has set a built environment sector reduction target of 40 - 45% relative to 2030 pre-NDP (National Development Plan) projections.

10.12 Following on from Ireland declaring a climate and biodiversity emergency in May 2019 and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme for the Climate Action (Amendment) Bill 2019 in December 2019 (Government of Ireland, 2020a). The

General Scheme was prepared for the purposes of giving statutory effect to the core objectives stated within the CAP. It is expected that the new Climate Action (Amendment) Bill (the Bill) will be published before the end of 2020.

10.13 In October 2020, the Climate Action and Low Carbon Development (Amendment) Bill 2020 (Government of Ireland, 2020b) was published in draft format (draft 2020 Climate Act) which amends and enhances the 2015 Climate Act. Once approved, the purpose of the 2020 Climate Act is to provide for the approval of plans 'for the purpose of pursuing the transition to a climate resilient and climate neutral economy by the end of the year 2050'. The 2020 Climate Act will also 'provide for carbon budgets and a decarbonisation target range for certain sectors of the economy'. The 2020 Climate Act removes any reference to a national mitigation plan and instead refers to both the Climate Action Plan, as published in 2019, and a series of National Long Term Climate Action Strategies. In addition, the Environment Minister shall request each local authority to make a 'local authority climate action plan' lasting five years and to specify the mitigation measures and the adaptation measures to be adopted by the local authority.

Construction phase

Air Quality

10.14 The Institute of Air Quality Management in the UK (IAQM) guidelines (2014) outline an assessment method for predicting the impact of dust emissions from demolition, earthworks, construction and haulage activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development in order to predict the likely magnitude of the dust impacts in the absence of mitigation measures.

Climate

10.15 The impact of the construction phase of the development on climate was determined by a qualitative assessment of the nature and scale of greenhouse gas generating construction activities associated with the Proposed Development.

Operational Phase

Air Quality

10.16 Operational phase traffic has the potential to impact air quality. The UK DMRB guidance (UK Highways Agency, 2019a), states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. The TII guidance (2011) was based on the previous version of the UK DMRB guidance (UK Highways Agency, 2007) and notes that the TII guidance should be adapted for any updates to the DMRB (see Section 1.1 of *Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes, 2011)*.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- A change in speed band; and
- A change in carriageway alignment by 5m or greater.

10.17 By definition of the criteria above, there are no road links impacted as a result of the Proposed Development. Therefor no assessment using the DMRB model was required for the Proposed Development as there is no potential for significant impacts to air quality.

Climate

10.18 The UK Highways Agency has published an updated DMRB guidance document in relation to climate impact assessments *LA 114 Climate* (UK Highways Agency 2019b). The following scoping criteria are used to determine whether a detailed climate assessment is required for a proposed project during the operational stage. If any of the road links impacted by the proposed development meet or exceed the below criteria, then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

10.19 None of the road links in the vicinity of the Proposed Development meet the scoping criteria above and therefor a detailed assessment has been scoped out as there is no potential for significant impacts to climate.

Receiving environment

Meteorological Data

10.20 A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

10.21 The nearest representative weather station collating detailed weather records is Casement Aerodrome, which is located approximately 1.5 km south of the site. Casement Aerodrome met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 10.1). For data collated during five representative years (2015 – 2019) (Met Eireann, 2021), the predominant wind direction is westerly to south-westerly, with generally moderate wind speeds averaging 5.5 m/s for the period 1981 - 2010.

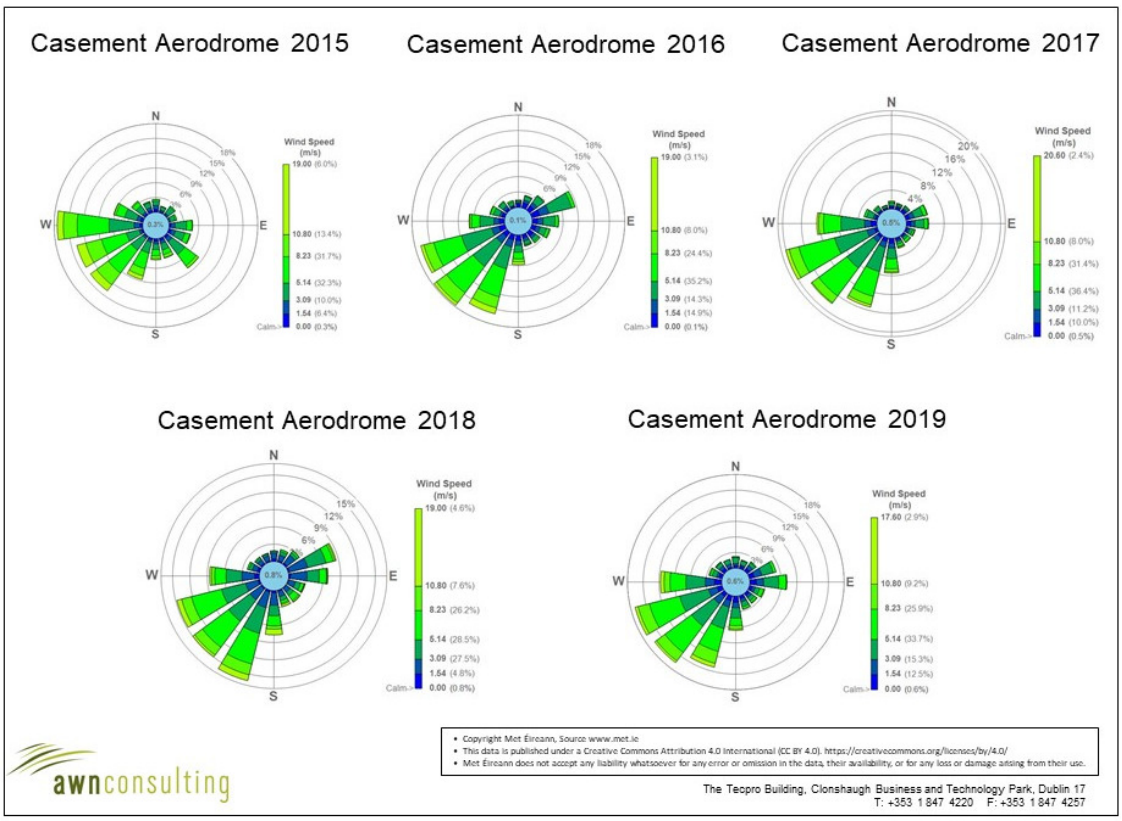

Figure 10.1 Casement Aerodrome Windrose 2015 – 2019 (MET, 2021)

Baseline Air Quality

10.22 Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent EPA published annual report on air quality "Air Quality In Ireland 2019" (EPA 2020a) details the range and scope of monitoring undertaken throughout Ireland.

10.23 As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes as outlined within the EPA document titled 'Air Quality In Ireland 2019' (EPA 2020a). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000 is defined as Zone D. In terms of air monitoring, the area of the Proposed Development in Grangecastle is categorised as Zone A as explained with the EPA document titled '*Air Quality in Ireland 2019'* (EPA 2020a).

NO_2

10.24 With regard to NO_2, continuous monitoring data from the EPA (EPA 2020a), at suburban Zone A background locations in Rathmines, Swords and Ballyfermot show that current levels of NO_2 are below both the annual and 1-hour limit values, with annual average levels ranging from 15 - 22 µg/m^3 in 2019 (see Table 10.2). Sufficient data is available for the station in Ballyfermot to observe long-term trends since 2015 (EPA 2020a), with annual average results ranging from 16 – 20 µg/m^3. Based on these results, an estimate of the current background NO_2 concentration in the region of the proposed development is 17 µg/m^3.

Table 10.2 Background NO_2 Concentrations In Zone A Locations (□g/m^3)

Station	Averaging Period Notes 1,2	Year				
		2015	2016	2017	2018	2019
Rathmines	Annual Mean NO_2 (µg/m^3)	18	20	17	20	22
	Max 1-hr NO_2 (µg/m^3)	106	102	116	138	183
Swords	Annual Mean NO_2 (µg/m^3)	13	16	14	16	15
	Max 1-hr NO_2 (µg/m^3)	170	206	107	112	108
Ballyfermot	Annual Mean NO_2 (µg/m^3)	16	17	17	17	20
	Max 1-hr NO_2 (µg/m^3)	142	127	148	217	124

PM_{10}

10.25 Continuous PM_{10} monitoring carried out at the Ballyfermot, Rathmines, Tallaght and Phoenix Park Zone A locations in 2015 - 2019 showed annual mean concentrations ranging from 9 to 16 µg/m^3, with at most 5 exceedances (in Rathmines) of the 24-hour limit value of 50 µg/m^3 (35 exceedances are permitted per year) (EPA, 2020a). Based on this EPA data, an estimate of the background PM_{10} concentration in the region of the development is 14 µg/m^3.

Table 10.3 Background PM_{10} Concentrations In Zone A Locations (□g/m^3)

Station	Averaging Period	Year				
		2015	2016	2017	2018	2019
Ballyfermot	Annual Mean PM_{10} (µg/m^3)	12	11	12	16	14
	24-hr Mean > 50 µg/m^3 (days)	3	0	1	0	7
Tallaght	Annual Mean PM_{10} (µg/m^3)	14	14	12	15	12
	24-hr Mean > 50 µg/m^3 (days)	4	0	2	1	3
Rathmines	Annual Mean PM_{10} (µg/m^3)	15	15	13	15	15
	24-hr Mean > 50 µg/m^3 (days)	5	3	5	2	9
Phoenix Park	Annual Mean PM_{10} (µg/m^3)	12	11	9	11	11
	24-hr Mean > 50 µg/m^3 (days)	2	0	1	0	2

$PM_{2.5}$

10.26 Continuous $PM_{2.5}$ monitoring at the Zone A location of Rathmines over the period 2015 – 2019 (EPA, 2020a) indicated an average $PM_{2.5}/PM_{10}$ ratio ranging from 0.53 – 0.68. Based on this information, a conservative ratio of 0.70 was used to generate a background $PM_{2.5}$ concentration of 9.8 µg/m^3.

Sensitivity of the Receiving Environment

10.27 In line with the UK Institute of Air Quality Management (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction'* (2014) prior to assessing the impact of dust from a Proposed Development the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time.

10.28 In terms of receptor sensitivity to dust soiling, there are two no. high sensitivity residential properties within 20 m of the proposed works area (see Figure 10.2). Therefore, the overall sensitivity of the area to dust soiling impacts is considered medium based on the IAQM criteria outlined in Table 10.4.

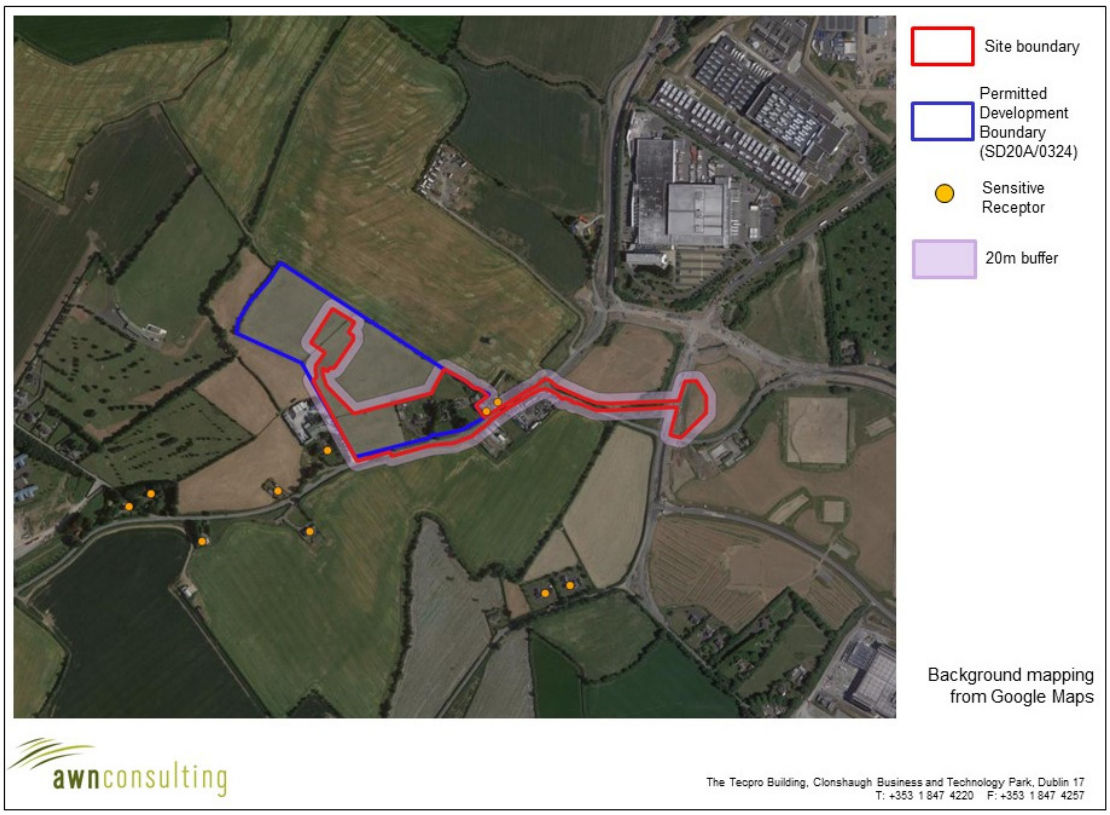

Figure 10.2 Location of Sensitive Receptors within 20m of Site

Table 10.4 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	**Medium**	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

10.29 In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM_{10} concentration, receptor sensitivity based on type (residential receptors

are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the Proposed Development is estimated to be 14 µg/m^3 and there are 2 no. residential properties located within 20 m of the proposed construction works (see Figure 10.2). Based on the IAQM criteria outlined in Table 10.5, the worst case sensitivity of the area to human health is considered to be low.

Table 10.5 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number Of Receptors	Distance from source (m)				
			<20	<50	<100	<200	<350
High	< 24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	**Low**	Low	Low	Low	Low
Medium	< 24 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	< 24 µg/m^3	>1	Low	Low	Low	Low	Low

Climate Baseline

10.30 Anthropogenic emissions of greenhouse gases in Ireland included in the EU 2020 strategy are outlined in the most recent review by the EPA which details provisional emissions up to 2019 (EPA, 2020b). The data published in 2020 states that Ireland will exceed its 2019 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC1 by an estimated 6.98 Mt. For 2019, total national greenhouse gas emissions are estimated to be 59.90 million tonnes carbon dioxide equivalent (Mt CO_2eq) with 45.71 MtCO_2eq of emissions associated with the ESD sectors for which compliance with the EU targets must be met. Agriculture is the largest contributor in 2019 at 35.3% of the total, with the transport sector accounting for 20.3% of emissions of CO_2.

10.31 GHG emissions for 2019 are estimated to be 4.5% lower than those recorded in 2018. Emission reductions have been recorded in 6 of the last 10 years. However, compliance with the annual EU targets has not been met for four years in a row. Emissions from 2016 – 2019 exceeded the annual EU targets by 0.29 MtCO_2eq, 2.94 MtCO_2eq, 5.57 MtCO_2eq and 6.98 MtCO_2eq respectively. Agriculture is consistently the largest contributor to emissions with emissions from the transport and energy sectors being the second and third largest contributors respectively in recent years.

10.32 The EPA 2019 GHG Emissions Projections Report for 2018 – 2040 (EPA 2019) notes that there is a long-term projected decrease in greenhouse gas emissions as a result of inclusion of new climate mitigation policies and measures that formed part of the National Development Plan 2018-2027 (NDP) which was published in 2018. Implementation of these are classed as a "*With Additional Measures scenario*" for future scenarios. A change from generating electricity using coal and peat to wind power and diesel vehicle engines to electric vehicle engines are envisaged under this scenario. While emissions are projected to decrease in these areas, emissions from agriculture are projected to grow steadily due to an increase in animal numbers. However, over the period 2013 – 2020 Ireland is projected to cumulatively exceed its compliance obligations with the EU's Effort Sharing Decision (Decision No. 406/2009/EC) 2020 targets by approximately 10 Mt CO_2eq under the "*With Existing Measures*" scenario and 9 Mt CO_2eq under the "*With Additional Measures*" scenario (EPA, 2019).

Characteristics of the Proposed Development

Construction phase

10.33 The Proposed Development will involve the provision of two no. 110kV transmission lines and a 110kV Gas Insulated Switchgear (GIS) substation compound and Transformers / MV switch room compound along with associated and ancillary works. These works are described in detail within Chapter 2 (Description of the Proposed Development) of this EIAR. The key civil engineering works which will have a potential impact on air quality and climate during construction are summarised below:

(i) During construction, an amount of soil will be generated as part of the site preparation works and during excavation for building foundations and for the installation of ducting for the cable installations.
(ii) Infilling and landscaping will be undertaken.
(iii) Temporary storage of construction materials
(iv) Construction traffic accessing the site will emit air pollutants and greenhouse gases during transport.

10.34 As outlined in the mitigation section of this chapter, a dust minimisation plan will be formulated for the construction phase of the Proposed Development to ensure no dust nuisance occurs at nearby sensitive receptors.

Operational Phase

10.35 During the operational phase, traffic accessing the site for maintenance purposes has the potential to impact on air quality and climate. However, this traffic will not be of the magnitude to cause a significant impact.

Potential Impacts of the Proposed Development

Construction Phase

Air Quality

10.36 The greatest potential impact on air quality during the construction phase of the Proposed Development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 350m of a construction site, the majority of the deposition occurs within the first 50m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction.

10.37 It is important to note that the potential impacts associated with the construction phase of the Proposed Development are short-term in nature. When the dust minimisation measures detailed in the mitigation section of this chapter are implemented, fugitive emissions of dust from the site will not be significant and will pose no nuisance at nearby receptors.

10.38 In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area. The major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (movement of heavy vehicles).

Demolition

10.39 Demolition will primarily involve the removal of buildings or structures currently on the site in a potentially dusty manner. This may also involve dust generation at heights. Dust emission magnitude from demolition can be classified as small, medium and large and are described below.

Large: Total building volume >50,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level;

Medium: Total building volume 20,000 m^3 – 50,000 m^3, potentially dusty construction material, demolition activities 10-20 m above ground level; and

Small: Total building volume less than 20,000 m^3.

10.40 There is a small amount of demolition work required for the proposed development with the removal of existing buildings on the site with a total GFA of 1,429 m^2 (Permitted and Proposed Development). The building volume associated with this will be significantly less than 20,000 m^3 and therefore the dust emissions magnitude can be categorized as small. As the overall sensitivity of the area to dust soiling impacts is medium there is a low risk of dust soiling impacts from the proposed demolition activities according to the IAQM guidance (see Table 10.6). There is an overall negligbile risk of human health impacts as a result of the demolition activities as the overall sensitivity of the area to human health impacts is low.

Table 10.6 Risk of Dust Impacts – Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Earthworks

10.41 Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

Large: Total site area > 10,000m^2, potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds > 8 m in height, total material moved >100,000 tonnes;

Medium: Total site area 2,500m^2 – 10,000 m^2, moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8 m in height, total material moved 20,000 – 100,000 tonnes;

Small: Total site area < 2,500m^2, soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4 m in height, total material moved < 20,000 tonnes, earthworks during wetter months.

10.42 The dust emission magnitude for the proposed earthwork activities can be classified as medium as the total material involved in excavation and infill works will be approximately 80,000 tonnes.

10.43 The sensitivity of the area is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. As outlined in Table 10.7, this results in an overall medium risk of temporary dust soiling impacts and a low risk of temporary human health impacts as a result of the proposed earthworks activities.

Table 10.7 Risk of Dust Impacts – Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Construction

10.44 Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:
Large: Total building volume > 100,000 m^3, on-site concrete batching, sandblasting;

Medium: Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on-site concrete batching;

Small: Total building volume < 25,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

10.45 The dust emission magnitude for the proposed construction activities can be classified as medium as a worst-case as the total building volume for the MV Switch Building and GIS Substation will be significantly less than 25,000 m^3.

10.46 The sensitivity of the area is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. As outlined in Table 10.8, this results in an overall low risk of temporary dust soiling impacts and a negligible risk of temporary human health impacts as a result of the proposed construction activities.

Table 10.8 Risk of Dust Impacts – Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Trackout

10.47 Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

Large: > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m;

Medium: 10 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100 m;

Small: < 10 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

10.48 The dust emission magnitude for the proposed trackout can be classified as small as there will be less than 10 outward HGV movements per day associated with the Proposed Development. As outlined in Table 10.9, this results in an overall low risk of temporary dust soiling impacts and a negligible risk of temporary human health impacts as a result of the proposed trackout activities.

Table 10.9 Risk of Dust Impacts – Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Summary of Dust Emission Risk

10.49 The risk of dust impacts as a result of the Proposed Development are summarised in Table 10.10 for each activity. The magnitude of risk determined is used to prescribe the level of site specific mitigation required for each activity in order to prevent significant impacts occurring.

10.50 Overall, there is a worst case medium risk of dust soiling impacts and at most a low risk of human health impacts associated with the proposed works. Best practice dust mitigation measures will be implemented to ensure there are no impacts at nearby sensitive receptors as a result of dust emissions. When the dust mitigation measures detailed in the mitigation section of this chapter are implemented, fugitive emissions of dust from the site will be insignificant and pose no nuisance at nearby receptors.

Table 10.10 Summary of Dust Impact Risk used to Define Site-Specific Mitigation

Potential Impact	Dust Emission Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low Risk	Medium Risk	Low Risk	Low Risk
Human Health	Negligible Risk	Low Risk	Negligible Risk	Negligible Risk

Climate

10.51 There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO_2 and N_2O emissions. The Institute of Air Quality Management document *Guidance on the Assessment of Dust from Demolition and Construction* (IAQM, 2014) states that site traffic and plant is unlikely to make a significant impact on climate. Therefore, the impact on climate is considered to be imperceptible and short term.

Operational phase

Air Quality & Climate

10.52 During operation, the cables will be buried underground and therefore there will be no emissions to atmosphere. There is the potential for maintenance vehicles accessing the substation site to result in emissions of NO_2, $PM_{10}/PM_{2.5}$ and CO_2. However, due to the infrequent nature of maintenance activities and the low number of vehicles involved emissions are not predicted to be significant. A detailed air quality and climate assessment was scoped out for the operational stage of the development as per the UK DMRB screening criteria. Operational stage impacts to air quality and climate are predicted to be imperceptible and long-term.

Do-Nothing Scenario

10.53 Under the Do Nothing Scenario no construction works will take place and the previously identified impacts of fugitive dust and particulate matter emissions and emissions from equipment and machinery will not occur. The ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from new developments in the surrounding industrial estates, changes in road traffic, etc.). Therefore, this scenario can be considered ***neutral*** in terms of both air quality and climate.

Remedial and mitigation measures

Construction phase

10.54 The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the following management plan has been formulated by drawing on best practice guidance from Ireland, the UK and the USA based on the following publications:

- 'Guidance on the Assessment of Dust from Demolition and Construction' (IAQM, 2014);
- 'Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings' (The Scottish Office, 1996);
- 'Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance' (UK Office of Deputy Prime Minister, 2002);
- 'Controlling Particles, Vapours & Noise Pollution From Construction Sites' (BRE, 2003);
- 'Fugitive Dust Technical Information Document for the Best Available Control Measures' and the USA (USEPA, 1997); and

- 'Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition' (periodically updated) (USEPA, 1986).

10.55 In advance of work starting on site, the works contractor will prepare a detailed Construction Environmental Management Plan (CEMP). The CEMP will set out the overarching vision of how the construction of the Proposed Development will be managed in a safe and organised manner by the Contractor. The CEMP will be a live document. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent planning conditions relevant to the Proposed Development.

Site Management

10.56 The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies.

10.57 At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 10.1 for the wind rose for Casement Aerodrome). As the prevailing wind is predominantly westerly to south-westerly, locating construction compounds and storage piles downwind (to the east or north-east) of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

10.58 Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed (UK Office of Deputy Prime Minister (2002), BRE (2003)). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials (USEPA, 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods were care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised;
- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein; and
- At all times, the procedures put in place will be strictly monitored and assessed.

10.59 The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

Demolition

10.60 Prior to demolition, blocks should be soft stripped inside buildings (retaining walls and windows in the rest of the building where possible, to provide a screen against dust). During the demolition process,

water suppression should be used, preferably with a hand-held spray. Only the use of cutting, grinding or sawing equipment fitted or used in conjunction with a suitable dust suppression technique such as water sprays/local extraction should be used. Drop heights from conveyors, loading shovels, hoppers and other loading equipment should be minimised, if necessary fine water sprays should be employed.

Site Roads / Haulage Routes

10.61 Movement of construction trucks along site roads (particularly unpaved roads) can be a significant source of fugitive dust if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK Office of Deputy Prime Minister, 2002), as follows:

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved site roads;
- Access gates to the site will be located at least 10m from sensitive receptors where possible;
- Bowsers or suitable watering equipment will be available during periods of dry weather throughout the construction period. Research has found that watering can reduce dust emissions by 50% (USEPA, 1997). Watering will be conducted during sustained dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use;
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.

Land Clearing / Earth Moving

10.62 Land clearing / earth-moving works during periods of high winds and dry weather conditions can be a significant source of dust. The following mitigation measure shall be employed:

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering will be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust;
- During periods of very high winds (gales), activities likely to generate significant dust emissions will be postponed until the gale has subsided.

Storage Piles

10.63 The location and moisture content of storage piles are important factors which determine their potential for dust emissions. The following mitigation measure shall be employed:

- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles will be located downwind of sensitive receptors;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust. The regular watering of stockpiles has been found to have an 80% control efficiency (UK Office of Deputy Prime Minister, 2002); and
- Where feasible, hoarding will be erected around site boundaries to reduce visual impact. This will also have an added benefit of preventing larger particles from impacting on nearby sensitive receptors.

Site Traffic on Public Roads

10.64 Spillage and blow-off of debris, aggregates and fine material onto public roads will be reduced to a minimum by employing the following measures:

- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- At the main site traffic exits, a wheel wash facility will be installed. All trucks leaving the site must pass through the wheel wash. In addition, public roads outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.

Summary of Dust Mitigation Measures

10.65 The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed; and
- The specification of effective measures to deal with any complaints received.

Operational phase

10.66 No mitigation is proposed for the operation phase of the Proposed Development as it is predicted to have an imperceptible impact on air quality and climate.

10.67 Cumulatively, in relation to climate mitigation, the proposed development has been designed to minimise the impact on climate. The proposed development will allow for the proposed Information Communication Technology (ICT) development (SDCC Reg. Ref. SD20A/0324) to source electricity from the national grid.

10.68 Data centres are typically 84% more efficient than on-premises servers. In addition, in terms of total forecasted capacity, it is predicted that 1,700MW of data centres capacity will be operational by 2025. However, the carbon intensity of electricity is predicted to decrease from 331 gCO_2/kWh in 2019 to 100 gCO_2/kWh in 2030 as a result of the increase in renewables to 70% of the electricity market by 2030. Overall, it is predicted that data centres will peak at 2.2% of total GHG emissions in 2024 and will fall or level off after this date (Host In Ireland, 2020).

Residual Impacts of the Proposed Development

Construction phase

Air Quality

10.69 When the dust mitigation measures detailed in the mitigation section of this Chapter are implemented, fugitive emissions of dust and particulate matter from the site will be ***short-term*** and ***imperceptible*** in nature, posing no nuisance at nearby receptors.

Climate

10.70 Based on the scale and temporary nature of the construction works and the intermittent use of equipment, the potential impact on climate change and transboundary pollution from the Proposed Development is deemed to be ***short-term*** and ***imperceptible*** in relation to Ireland's obligations under the EU 2030 target.

Human Health

10.71 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-term*** and ***imperceptible*** with respect to human health.

Operational phase

Air Quality & Climate

10.72 Operational phase impacts associated with the proposed development are predicted to be ***long-term*** and ***imperceptible*** as the cables will be buried underground once constructed and there will be minimal emissions associated with maintenance vehicles accessing the substation site.

Cumulative Impacts

Construction phase

10.73 According to the IAQM guidance (2014), there is the potential for cumulative dust impacts to any nearby sensitive receptors should the construction phase of the Proposed Development coincide with the construction phase of other permitted developments within 350m of the site. There is the potential for cumulative construction dust impacts associated with construction works associated with the permitted Power Generation Facility (SDCC Reg. Ref. SD20A/0058) and the ICT development (SDCC Reg. Ref. SD20A/0324), if permitted, on the wider site should these works coincide with the construction of the Proposed Development.

10.74 There is a low risk of dust soiling impacts and a negligible risk of human health impacts associated with the Proposed Development. The dust mitigation measures outlined in this chapter will be applied during the construction phase which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the Proposed Development and the permitted and Proposed Developments on the site and / or simultaneous construction of any other developments within 350m of the site are deemed ***short-term*** and ***imperceptible***.

10.75 Due to the relatively small scale of the Proposed Development and the short-term construction stage significant cumulative impacts to climate are not predicted.

10.76 With appropriate mitigation measures in place, the predicted cumulative impacts on air quality and climate associated with the construction phase of the Proposed Development are deemed ***short-term*** and ***imperceptible***.

Operational phase

10.77 Operational phase direct impacts on air quality associated with the Proposed Development are predicted to be imperceptible. As there are no emissions to atmosphere associated with the cables once constructed as they will be buried underground there are no potential impacts associated with this aspect of the development. Cumulative traffic emissions associated with site maintenance vehicles and vehicles on the local road network have the potential to impact air quality. However, as the number of vehicles required for maintenance activities is low and infrequent in nature cumulative impacts are considered ***imperceptible*** and ***long-term***.

10.78 The Proposed Development was considered within the cumulative air dispersion modelling assessment for the permitted data centre development. The results indicated emissions of NO_2 associated with the back-up diesel generators were in compliance with the ambient air quality standards. Therefore, cumulative impacts to air quality will be ***long-term***, ***localized, negative*** and ***slight***.

10.79 In relation to climate, there will be no direct operational CO_2 emissions as electricity will be sourced from the national grid. The indirect CO_2 emissions associated with the electricity to operate the ICT development (SDCC Reg. Ref. SD20A/0324) were determined within the EIAR for the development and were found to be insignificant in relation to climate.

10.80 As the ICT development is over 20 MW, a greenhouse gas emission permit will be required for the facility, if permitted, which will be regulated under the EU-wide Emission Trading Scheme (ETS). Electricity providers form part of the ETS and thus greenhouse gas emissions from these electricity generators are not included when determining compliance with the targeted 30% reduction in the non-ETS sector i.e. electricity associated greenhouse gas emissions will not count towards the Effort Sharing Decision target. Thus, any necessary increase in electricity generation due to data centre

demand will have no impact on Ireland's obligation to meet the EU Effort Sharing Decision. On an EU-wide basis, where the ETS market in 2018 is approximately 1,655 million tonnes CO_2eq, the impact of the emissions associated with the permitted data centre development will be less than 0.016% of the total EU-wide ETS market which is imperceptible.

10.81 Overall, the impact to air quality and climate as a result of the proposed cumulative development will be ***negative***, ***long-term*** and ***imperceptible***.

Monitoring

10.82 Monitoring is not proposed for the construction phase of the proposed development as impacts are predicted to be imperceptible. There is a negligible risk of dust soiling and human health impacts as a result of the construction phase. Once the dust mitigation measures outlined in the mitigation section are implemented construction dust emissions will be imperceptible.

10.83 There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

11. LANDSCAPE AND VISUAL IMPACT

11.1 This Landscape and Visual Assessment (LVIA) chapter of the EIA Report has been prepared by Kevin Fitzpatrick Landscape Architecture Ltd. The purpose of this assessment was to analyse the existing landscape and to assess the likely potential visual impacts arising from the Proposed Development on the existing landscape and any mitigation measures proposed. The LVIA is part of the Environmental Impact Assessment Report (EIA Report) that will accompany the application for permission.

11.2 The criteria as set out in the current EPA Guidelines on Information to be contained in Environmental Impact Assessment Reports (2017, Draft) are used in the assessment of the likely impacts. The criteria for rating the significance of impacts are as defined in table 11.1 below:

Table 11.1 Criteria for significance of effects under EPA Guidelines

EPA Rating	
Imperceptible	An effect capable of measurement but without significant consequences
Not Significant	An effect which causes noticeable changes in the character of the environment without significant consequences
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
Moderate	An effect that alters the character of the environment in a manner that is consistent with the existing and emerging baseline trends
Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Very Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
Profound	An effect which obliterates sensitive characteristics

11.3 The ratings may have negative, neutral or positive application where:

- Positive impact - a change which improves the quality of the environment.
- Neutral impact – No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
- Negative impact - a change which reduces the quality of the environment.

11.4 Terms relating to the duration of impacts are as described in the EPA Guidelines as:

- Momentary Effects - lasting from seconds to minutes
- Brief Effects - lasting less than a day
- Temporary Effects - lasting less than a year
- Short-term Effects - lasting one to seven years
- Medium-term Effects - lasting seven to fifteen years
- Long-term Effects - lasting fifteen to sixty years
- Permanent Effects - lasting over sixty years

11.5 The significance of impacts on the perceived landscape will depend partly on the number of people affected, but also on judgments about how much the changes will matter and in relation to other senses i.e. sound, feeling, etc., experienced by those concerned.

Methodology

11.6 The assessment was carried out by analysis of the proposals through photomontages, plans, aerial photographs, tree survey by 'The Tree File Ltd.', historic maps and by reference to the 'South County Dublin Development Plan 2016-2022' and the 'Landscape Character Assessment of South Dublin County (June 2016 Updated)'

11.7 This chapter has been prepared having regard to the following guidelines:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – Draft (EPA, 2017); and
- Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (Landscape Inst. + IEMA 2013).

11.8 A study of the environmental impact on the biodiversity of the site will be covered in Chapter 6 of this EIA Report.

Receiving environment

11.9 The Proposed Development site is located west of the Grange Castle South Business Park in the townland of Milltown and Clutterland, Co. Dublin. The overall site of 4.6Ha. can be sub-divided into two parts that form the parcel of land within which the substation and component parts sits; and the site of the two transmission lines from the edge of the wider substation site that connects to the Castlebaggot – Kilmahud some 550m to the east.

11.10 The proposed substation and ancillary elements are located within a wider parcel of land that has a large, irregular form measuring 475m on its longest north-west to south-east axis and 240m on the south-north axis. This wider site is subject of a master plan on which a Power Generation Facility is permitted under SDCC Reg. Ref. SD20A/0058, and a concurrent application is subject to a Further Information request from SDCC under SDCC Reg. Ref. SD20A/0324. This wider site is referred in this EIA Report as the Masterplan site.

11.11 The northern and western site boundaries of the Masterplan site are relatively straight. The southern boundary consists of two sections. The south-eastern boundary with the public road is more irregular in form as it navigates around existing properties to form the legal boundary. The land area of this Masterplan site totals 8.2hecatres with 3.4ha. forming part of the Proposed Development site. Generally, the lands are relatively level, at between +75m and +77m throughout this part of the site. There is a slight fall from south-east to north-west across this part of the Proposed Development site.

11.12 This part of the Proposed Development site only forms half of the application site, and includes the residential properties of Little Acre and Bulmer along Peamount Road and some of the adjacent existing fields.

11.13 The Proposed Development site also extends and includes a c. 300m length of Peamount Road; a c. 100m stretch of the former R134 road that is disused; and cuts across land owned by SDCC under the Griffeen River and under the newly realigned Baldonnel Road, where it will terminate at the Castlebaggot-Kilmahud Circuit to the immediate east of the Baldonnel Road. The full extent of the Proposed Development site is indicated in Figure 11.1.

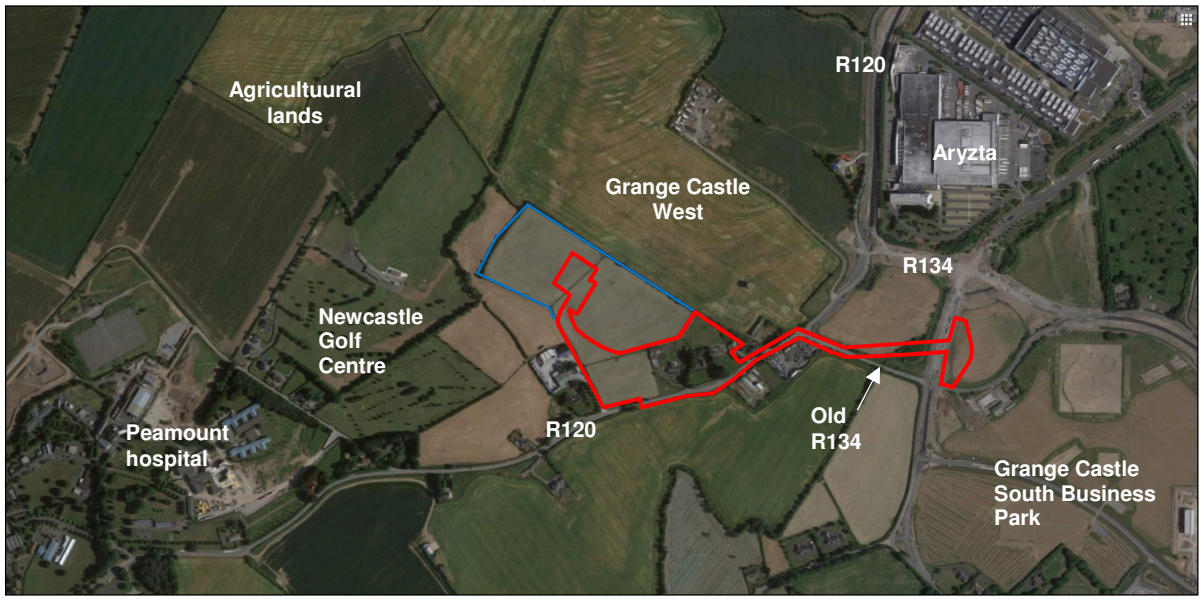

Figure 11.1 Proposed Development site outlined in red with the Permitted Development and wider site outlined in blue in context of surrounding development and land uses (Source: Google Earth)

11.14 The land use of the substation part of the site is largely divided into two distinct sections divided by built structures and associated vegetation. The eastern corner of the site is currently occupied by two residential properties and associated outbuildings along with associated agricultural buildings. The landscape character of this part of the site would be considered that of a traditional rural, residential landscape typical of the housing distribution in the surrounding local area. The parts of the Proposed Development site outside this area would be considered to have the character of an agricultural field with traditional hedgerow boundaries.

11.15 The wider part of the proposed substation site is bounded on the northern site boundary by an existing native hedgerow containing a number of existing trees. An existing timber post and rail with wire mesh fence partially forms the southern boundary with the Peamount Rd. In the eastern corner of the site, the boundaries are formed by walls, tree lines and formal hedge planting associated with the existing properties. These lands, for the purposes of this assessment, can be viewed in terms of the Permitted Development and Proposed Development.

11.16 The transmission line part of the Proposed Development site is characterised by a Regional Road (R120) that contains grass verges on either side and with a mature hedgerow on its southern boundary that changes to a stone wall and agricultural buildings further to the east to the south of the Masterplan site. The northern part of Peamount Road is bounded by a timber post and rail fence at the south-eastern corner of the Masterplan site. The road then becomes narrower as it passes between two houses to the north (outside of the application site) and the agricultural buildings and car sales forecourt to the immediate south-east of the junction with the former R134.

11.17 The former R134 is bounded along its western part by mature hedgerow to the north and the car sales forecourt to the immediate south. A hedgerow bounds the former R134 beyond the car sales forecourt. The realigned Griffeen River and realigned Baldonnel Road form the eastern end of the 110kV alignment.

11.18 In the wider landscape the Proposed Development site is located in a generally flat area. The site is located between two landscape typologies, to the east of the Proposed Development site is an area that has been developed both industrially and commercially at quite an intensive level in recent years. This landscape is characterised by very large built developments and new tree lined roads as well as many sites which are under construction at present. A contrasting landscape typology can be identified to the west of the site, where the landscape is characterised by traditional hedgerow boundaries associated with agricultural land which are typical of the local area, here both medium-large sized field patterns can be found. A rural and scattered residential distribution can be found here along with farm structures associated with farmland in the area. In summary, the landscape in its entirety could be described as a transitional landscape, where traditional land uses are being transformed to accommodate new development.

11.19 A tree survey was undertaken as part of the application for the Permitted Development (Refer to Chapters 2 and 3). This informed the design and layout of the Permitted Development and the location of the proposed substation. According to the Tree Survey and Report, by the Tree File. Ltd. (submitted with this application) there are no trees or vegetation of interest on the subject lands. Along the north and western boundary exists a native hedgerow boundary which is dominated by Hawthorn with some emerging trees, mostly consisting of Ash and Elm. Other species in the hedgerow include Blackthorn, Bramble, Ivy, Holly, and Elder. The health of the existing Elm trees is poor and the majority of this species on the subject lands are dead. There is a dramatic difference in landscape typology around the two existing dwellings located in the south eastern section of this part of the site. Ornamental trees, shrubs and hedges dominate this section of the subject lands. Tree species include Poplars, Monterrey Cypresses, Leyland Cypresses and various species of fruit trees.

Characteristics of the Proposed Development site

11.20 The character of the Proposed Development site and its environs has largely been determined by the following:

- the flat topography of the subject site and its surrounding environs;
- landscape history of agricultural use with grassland and traditional hedgerow field boundaries;
- the individual residences and farm buildings located in the local area;
- the number of large-scale industrial buildings in the local area; and

- the number of large visually dominant trees, hedgerows and ornamental planting associated with surrounding properties.

11.21 The proposed substation part of the Proposed Development site has the character of an agricultural field with traditional hedgerow field boundaries that contain the two residential properties and associated structures to the south-east. The transmission lines alignment has the character of a rural road; and rural agricultural landscape, with the final length crossing into a more built up area on the existing western edge of the Grange Castle South Business Park.

11.22 The surrounding environment with its contrast of new built structures and historic field patterns would be considered a 'transitional landscape'.

11.23 From a study and analysis of various historical map series; OSI 6-inch maps (1837-42) and OSI 25-inch maps (1888-1913), conclusions could be drawn on the landscape history of the local lands. The following conclusions are in relation to the permitted site, which is intrinsically linked to the proposed development site. The northern and western hedgerows on the edge of the site were in existence in both map series and were therefore growing on the subject lands since as early as 1837. The neighbouring commercial development that abuts the southern boundary appears to be a relatively modern development, as there are no built structures in this part of the site on the historic maps. The current structural boundary which runs along the southern boundary can't be traced back to the above maps, therefore it can be assumed that the two sites once formed the same lands. Similarly, the existing properties on site aren't present on these historic maps, although there were some structures outside the subject lands which appear to have formed the small hamlet of Milltown. In the local lands surrounding the subject site, we can generally trace the existing hedgerows and field boundaries back to the historical maps.

11.24 The landscape of the subject lands has no inherent aesthetic qualities of note.

11.25 The wider site is the subject of a permitted development (SDCC Reg. Ref. SD20A/0058) of a Power Generation Facility comprising of a power plant building, associated structures, mechanical plant, infrastructure and associated landscaping and earthworks around the perimeter. No construction work relating to the permitted development has commenced.

11.26 A concurrent application for an ICT facility (Planning Ref. SD20A/0324) to the south-east of the proposed substation site is currently subject to an Additional Information request from SDCC. This application includes additional landscaping and earthworks along the Peamount Road boundary. These additional landscaping and berms have been incorporated into the Proposed Development that is subject of this SID application.

11.27 For clarity, throughout the rest of this document the following terminology will be adhered to:

- The proposed substation development and transmission lines will be referred to as 'Proposed Development'
- The permitted development of the Power Generation Facility under Planning Ref. SD20A/0058 will be referred to as 'Permitted Development'
- The proposed data centre pending decision under Planning Ref. SD20A/0324 will be referred to as 'Concurrent Application'

11.28 A significant part of the Proposed Development site is located within the overall site of the Permitted Development and both are intrinsically and visually linked. The Proposed Development is integrated into the overall development as follows:

- The proposed Substation will be located in the centre of the Masterplan site between the Permitted Development of the Power Generation Facility and the Concurrent Application for the ICT Facility.
- There are no landscape proposals within the proposed substation and ancillary element parts of the site.
- The berms and landscaping applied for under the ICT facility application along Peamount Road and around the attenuation pond, are also included under this application as they did not form part of the Permitted PGF application.
- Perimeter boundary fencing in line with Eirgrid requirements is proposed along all of the boundaries of the substation and transformer / MV building compounds.

- Elements of the permitted development such as the earth berms and woodland planting which surround the site and the existing data halls will have a visual effect on the proposed substation part of the proposed development.

Landscape planning

11.29 Within the South Dublin County Development Plan 2016-2022 there are no specific landscape objectives that apply to the subject lands. There are a number of objectives that apply to the general environs of the site.

Green infrastructure objectives

- G2 Objective 1 states: *'To reduce fragmentation of the Green Infrastructure network and strengthen ecological links between urban areas, Natura 2000 sites, proposed Natural Heritage Areas, parks and open spaces and the wider regional Green Infrastructure network.'*
- G2 Objective 2 states: *'To protect and enhance the biodiversity value and ecological function of the Green Infrastructure network.'*
- G2 Objective 6 states: *'To protect and enhance the County's hedgerow network, in particular hedgerows that form townland, parish and barony boundaries, and increase hedgerow coverage using locally native species.'*
- G2 Objective 9 states: *'To preserve, protect and augment trees, groups of trees, woodlands and hedgerows within the County by increasing tree canopy coverage using locally native species and by incorporating them within design proposals and supporting their integration into the Green Infrastructure network.'*
- G3 Objective 3 states: *'To ensure the protection, improvement or restoration of riverine floodplains and to promote strategic measures to accommodate flooding at appropriate locations, to protect ground and surface water quality and build resilience to climate change.'*

Heritage Conservation & Landscape Objectives

- HCL15 Objective 3 states: *'To protect existing trees, hedgerows, and woodlands which are of amenity or biodiversity value and/ or contribute to landscape character and ensure that proper provision is made for their protection and management in accordance with Living with Trees: South Dublin County Council's Tree Management Policy 2015-2020.'*

11.30 There are no protected trees or tree groups within the Proposed Development site listed in the South Dublin County Development Plan 2016-2022.

11.31 There are no views or prospects that include the Proposed Development site listed in the South Dublin County Development Plan 2016-2022.

11.32 In the Landscape Character Assessment of South Dublin County (June 2016 updated), the subject lands are designated as being in the 'Newcastle Lowlands Character Area'. This area is listed as having a medium landscape sensitivity, due to the vulnerability of the agricultural landscape to urban pressures. The subject lands are located in the east of the area within the border area between the Urban Fringe character type and the Limestone Farmland Character type.

Existing Views and Visibility

11.33 Due to the topography on subject and local lands, the lack of any vertical features on subject lands and the significant number of trees and hedgerows in the area, the subject lands are not visible from many locations in the wider landscape. Where partial or distant views are possible it is the trees and the existing buildings associated with the permitted development lands and surrounding areas which are most visible and prominent.

11.34 The location from which the subject lands are most visually noticeable is along Peamount Road (R120 Road), most notably in the south-eastern corner of the site, as you approach the main site entrance from the south. From this point, the part of the subject lands which extend along the access road and around the attenuation pond are fully visible due to the flat nature of the landscape in the south-eastern

corner of the site. The site is also visible, albeit to a lesser extent, from further north along Peamount Road. The existing properties and the associated vegetation; mature trees, formal hedges and hedgerow on the permitted development lands provide screening to the subject lands from this point.

Characteristics of the Proposed Development

11.35 The details of the Proposed Development are fully detailed in Chapter 2 of this EIA Report. The Proposed Development involves the following works that have the potential to impact on the landscape. The characteristics listed below are in accordance with the proposed plans outlined as part of the drawings submitted as part of the planning application and can be summarised as:

- The proposed demolition of the existing two storey dwelling of Bulmer and associated outbuildings and stable building to the front of the site. The existing Little Acre dwelling and associated buildings are permitted to be demolished under SDCC Reg. Ref. SD20A/0058.
- The proposed 110kV Gas Insulated Switchgear (GIS) Substation Compound includes the provision of a two storey GIS Substation building (with a gross floor area of 1,430sqm) (known as the Peamount Substation), car parking, lighting, associated underground services and roads within a 3.0m high fenced compound, and all associated construction and ancillary works.
- The Transformers / MV switch room compound includes three transformers plus MV control room (200sqm), lighting and lightning masts, car parking, associated underground services and roads within a 3.0m high fenced and separate compound, and all associated construction and ancillary works.
- Two proposed underground single circuit 110kV transmission lines will connect the proposed Peamount 110kV GIS Substation to the existing Castlebaggot-Kilmahud circuit to the east. The proposed transmission lines cover a distance of approximately 940m within the townlands of Milltown and Clutterland. They will pass outside of the site and along and under the following: R120, the former Nangor Road, Griffeen River and the newly realigned Baldonnel Road.
- The development includes the connections to the proposed Peamount substation as well as to the Castlebaggot-Kilmahud circuit, as well as changes to the attenuation pond and landscaping permitted under SDCC Reg. Ref. SD20A/0058 and all associated construction and ancillary works.

Potential Impacts of the Proposed Development

Construction phase

11.36 The change of use of the site from its current state to that of a construction site has the potential to result in the following impacts:

- Visual impacts due to the introduction of new structures, access roads, machinery, materials storage, associated earthworks, car parking, lighting and hoarding;
- Change of character due to the change in use;
- Visual impacts caused by removal of trees and vegetation and road works; and
- Visual impacts as a result of change in ground level and earthworks.

Operational phase

11.37 The proposed works as described in the '*Characteristics of the Proposed Development*' has the potential to result in the following impacts:

- Visual impacts due to the introduction of new buildings and built structures;
- Visual impacts due to the introduction of new roads, parking, mechanical plant and lighting;
- Change of character due to the change in use; and
- Visual impact of landscape proposals associated with the Proposed and Permitted Development that includes earth modelling, hard surfaces, installation of new trees and vegetation.

Remedial and mitigation measures

11.38 The mitigation of potential negative landscape and visual impacts has influenced the design and layout of the scheme from the start of the design process. As a result of this, the following landscape design mitigation measures have been made as part of the Proposed and already granted under the Permitted Development:

- Earth modelling and large tree planting reinforced with woodland whip planting in belts has been proposed to provide a high level of visual screening of the most sensitive views of the development; and
- The retention of a number of existing trees and hedgerow belts with reference to the arborists' report to maintain some existing levels of screening to the site.

Remedial and mitigation measures

11.39 The Proposed Development is situated on suitably zoned lands in a landscape where a number of large developments have been recently constructed or have recently acquired planning permission. The construction of the Permitted Development of the Power Generation Facility (described in detail in chapter 2 and 3 of this EIA Report) will coincide with the construction of the Proposed Development and the built development and the significant landscape scheme permitted as part of the Permitted Development and now further enhanced to the south and south-west will provide substantial mitigation of the Proposed Development.

11.40 The mitigation of potential negative landscape and visual impacts of the Proposed Development was considered in the application made for the Permitted Development under SDCC Planning Ref. SD20A/0058. No additional landscape mitigation measures are therefore proposed beyond the additional berming and landscape planting along the south-west corner and bounding the Peamount Road. As a result of the mitigations measures, the following landscape design mitigation measures will continue to be implemented as part of both the Proposed and the Permitted Development:

- earth modelling and large tree planting, reinforced with woodland whip planting in belts is proposed to provide a high level of visual screening of the most sensitive views of the development;
- set back of built development form the perimeter of the lands to accommodate significant landscape buffer zones; and
- incorporation of the stormwater attenuation systems as above ground wetlands and ponds to improve the amenity, visual and biodiversity value of the landscape.

Predicted impacts of the Proposed Development

Construction phase

Impact on landscape character

11.41 The initial construction phase created by the clearance of the site and the construction of the buildings and plant will give rise to short-term impacts on the landscape character, through the introduction of new structures, machinery, ancillary works etc., a change to existing ground levels and earthworks along with the removal of any existing vegetation, grassland or scrub. There will also be a change to the landscape character as a result of a land-use change.

11.42 The construction compounds, temporary car parking and storage facilities etc. will be located sensitively to avoid any local visual sensitivities. Furthermore, the Proposed Development site is located in close proximity to the existing Grange Castle Business Park with recent built developments, including various similar scale sub-stations, data centres and other industrial units. In addition to this, the works associated with the Permitted Development will be coinciding with the Proposed Development. Consequently, the visual elements associated with construction would be considered part of a developing industrial landscape.

11.43 The construction of the underground transmission lines will require trenching and stockpiling of material along its route. The temporary works required to install the cables would be similar to works that have been undertaken in this area recently and will require some recently planted trees alongside the former and now closed R134 road to be removed.

11.44 With the above considered the impact on the landscape character during construction would be ***negative*** and considered ***moderate*** in magnitude and ***short-term*** in its duration.

Visual impacts

11.45 Visibility from most of the surrounding landscape will be limited by the existing buildings and vegetation in the local landscape and by the construction of the Permitted Development. Views from the west of

the site will be screened to some degree by existing residential dwellings, fencing, hedgerow vegetation and trees in the landscape surrounding the subject lands. From the north, vegetation associated with the canal will completely block any views of the subject lands from this amenity corridor; whilst from the south and east, views of the construction process will be more discernible as a result of the flat topography on the subject lands. Some screening will be provided however in the form of existing residential dwellings, fencing, hedgerow vegetation and trees in the local landscape. In addition to this, the works associated with the Permitted Development will be coinciding with the Proposed Development. Consequently, the visual elements associated with construction would be considered part of a developing industrial landscape.

11.46 The construction of the underground transmission lines will require trenching and stockpiling of material along its route. The temporary works required to install the cables would be similar to works that have recently been undertaken in this area.

11.47 With the above considered the visual impacts during construction would be ***negative*** and considered ***moderate*** in magnitude and ***short-term*** in duration.

Operational phase

Impact on Landscape Character

11.48 The operational phase will give rise to a noticeable change in the landscape character of the Proposed Development site. The Permitted Development on the Masterplan lands will significantly alter the landscape character and this new landscape will surround the substation that forms part of the Proposed Development.

11.49 The landscape measures under the Permitted Development will significantly improve the quality of the landscape character of this area. The significant amount of native woodland, wetland and grassland habitats to be created would have a very positive impact on the landscape character of this area and the wider environment. This will be added to as part of the Proposed Development.

11.50 The initial impact of the built development on the landscape character would be perceived as ***negative*** in the ***short-term*** due to the change in type from a field to a built structure. In the context of the surrounding Permitted Development however, notably the landscape proposals associated with it, and now further enhanced under the Proposed Development this impact would be significantly reduced. In the long term the level of this impact will continue to reduce further as the habitats establish and become integrated into the surrounding landscape.

11.51 The subject lands are specifically zoned for this type of development and there have been recent built developments of a much larger scale in the local vicinity including a number of Substations. Many of these built developments are dominant in views from the Proposed Development site. In this context the Proposed Development would be considered a continuation of existing trends in the local area.

11.52 The landscape proposals as part of the Permitted Development include the establishment of a significant level of native woodland, hedgerows and native wetland and grassland meadows. The overall landscape treatment will contribute positively to the landscape character of the area.

11.53 The overall impact on the landscape character would therefore be considered **ne*utral, short-term*** and ***slight*** due to the level of recently built and Permitted Development in the vicinity and the proposed development being located in a part of the site which has little value in terms of landscape character.

Visual Impacts

11.54 Visibility from most of the surrounding landscape will be limited by the existing buildings and vegetation and the buildings and landscape proposals of the Permitted Development. Views of the proposed substation site will be predominantly screened by the Permitted Development. Views from the North, South and East will be screened entirely by a combination of the proposed earthworks and planting scheme associated with the Permitted Development.

11.55 The overall visual impact of the Proposed Development would therefore be considered ***neutral, short-term*** and ***not significant*** due to the extent of screening associated with the Permitted Development and now enhanced under the Proposed Development to the south and south-west paired with the level of similar scale development in the surrounding area.

Impact on landscape planning

11.56 The Green Infrastructure objectives that apply to the Proposed Development site and its environs, are mostly general objectives aimed at the protection of the existing green infrastructure network and strengthening ecological links in the wider landscape.

11.57 The proposed landscape treatment around the Permitted Development will not be altered under the Proposed Development. The additional landscape treatment to the south-west and along Peamount Road will with the permitted landscape treatment create significant belts of native woodland linking the existing hedgerows and trees into a much larger ecological habitat, including a native wetland to the south-east of the site. The height of the berms and level of planting, will not be altered around the Permitted Development. New additional up to 6m high berms will be created to the boundary with Peamount Road and around the attenuation pond to the south-west of the overall site.

11.58 Most of the existing trees and hedgerows will be retained and improved by the additional native planting proposed and invasive species management. The level of tree cover and woodlands proposed will significantly increase the ecological value of the overall site and create strong ecological corridors through the site and connecting to wider landscape. The Proposed Development would be considered in accordance with these policy objectives.

Do-nothing scenario

11.59 In the event of this scenario the lands would continue to be left in the 'transition state' as it is currently. Without proper management of the landscape, it would go into decline as the fields revert to scrub areas. As the area has a specific zoning for development it is likely that the site would be developed in the future in a similar scale and type as is currently proposed.

Monitoring

11.60 Contracts will ensure good working practices to reduce any negative impacts arising from construction to the lowest possible level and to ensure that all machinery operates within clearly defined construction areas. Storage areas will be located to avoid impacting on sensitive views, trees, hedgerows, drainage patterns etc. and such areas will be fully re-instated prior to, and at the end of the construction contract. The works will also have continuous monitoring to ensure adequate protection of areas outside of the construction works.

Residual impacts

11.61 The residual impacts are assessed by reference to several specific views that have been visualised by verified photomontages. These locations are chosen to demonstrate the visual impact of the proposed development from all areas within the local and wider landscape where it may be visible. These visual representations are shown in Appendix 11.2 of the Appendix document with a view location map clearly indicating the viewpoint location and direction. For each view the baseline situation is shown (existing conditions) and the cumulative view of the full Permitted Development with the Proposed Development section of the view highlighted. A third set of views shows the cumulative view of the Proposed Development, Permitted Development and the concurrent application.

Visual impact assessment from specific locations

11.62 In order to achieve a realistic representation of the visual impacts of the Proposed Development, the Permitted Development on the overall lands to the north-west has been included in the photomontages. Therefore, this section of the LVIA assesses both the proposed and permitted developments together. This approach is reasonable given the inter linked nature of the developments as outlined within Chapter 2 of this EIA Report.

11.63 Another set of proposed views are included to illustrate the visual impact of the Proposed and Permitted Development alongside the concurrent application for an ICT Facility on lands to the south-east of the substation and transformer / MV building compounds. This represents the findings outlined in the Sections 11.82 onwards under the cumulative impact assessment of this chapter.

Photomontage 1 - The existing scenario.
Photomontage 2 - The Proposed Development (indicated by a red line) alongside the Permitted Development (indicated by a blue line) on day one of operations.

Photomontage 3 - The Proposed Development (indicated by a red line) alongside the Permitted Development (indicated by a blue line) and the Potential Future Development (indicated by a green line) on day one of operations.

View 1 – From the pedestrian towpath along the canal

Existing view

11.64 This view is located along the canal to the north of the site and is circa 880m from the site boundary. The site is completely blocked from view due to several landscape elements in the foreground, the water level of the canal is visible at the bottom of the view along with a number of trees and riparian planting growing on the banks of the canal. There is also some hedgerow in the background of the view along with an electricity pylon, however the view is obscured by the landscape elements in the foreground of the view. The elements considered to be of most value in this view are that of the canal itself and its associated vegetation.

Visual impact of the Proposed Development during construction

11.65 The Proposed Development will not result in any measurable visual impact on this view during construction. The construction process, machinery, storage of materials and built structures will be completely screened from view by the vegetation along the canal.

Visual impact of the Proposed Development during operation

11.66 The Proposed Development will not result in any measurable impact on this view. The new built structures and associated development will be completely screened from view by the existing vegetation associated with the canal.

View 2 – From new section of R120 road beside ARYZTA Food Solutions Ireland commercial unit

Existing view

11.67 This view location is positioned circa 612m to the north-east of the proposed substation and is looking south-west towards this part of the Proposed Development site. It provides expansive views over the existing flat agricultural landscape. The Dublin Mountains are visible in the top left corner of the view, however, considering that they are a background feature and only contribute to a small portion of the overall view, they would not be considered of high value. In the middle section of the view, the traditional hedgerow boundaries and trees typical of the agricultural landscape are also visible in the background, despite being somewhat obscured by an existing wall and railing which creates a visual screen. The bottom half and foreground of the view is taken up by a short-range view of the existing road and footpaths. This would be considered the most prominent element in the view and is of no value. Hedgerow vegetation and trees located between the viewpoint location and the subject lands mean that the view of the subject lands is obscured.

Visual impact of Proposed Development during construction

11.68 The Proposed Development will result in a ***negative*** impact on this view during construction. The construction process, machinery, storage of materials, built structures will be only partially screened from view by the existing hedgerows and trees which are located between the viewpoint as well as the existing wall and railing which creates a partial visual screen. The construction process and machinery would be familiar visual elements in the local landscape due to the number of large built developments under construction or recently constructed in this vicinity. The magnitude of the above negative effect would be considered **moderate** and **short-term in duration.**

Visual impact of Proposed Development during operation

11.69 The Proposed Development will not result in any measurable visual impact on this view during operation. The substation building will be screened by the earthworks, trees and woodland planting to be installed under the Permitted Development along this boundary.

View 3 – From road junction of the R120 and R134

Existing view

11.70 This view location is positioned directly east of the site looking westwards and is approximately 312m in distance away from the proposed substation part of the Proposed Development site. Many of the views here are short-range, located in the foreground of the image. These views are not considered of any value and consist of the existing road and associate signage, bollards and road-markings. The background of the image offers distant views over the existing flat agricultural landscape. The views are obscured by various elements in the mid-ground of the image such as a water tower, a number of streetlights and electricity pylons. A small number of trees and some traditional native hedgerow are visible in the background and offer some limited value to the overall view. The substation site is not visible from this viewpoint due to the flat topography and distance from the viewpoint location.

Visual impact of Proposed Development during construction

11.71 The Proposed Development will result in a negative impact from this view location. The construction process, machinery, storage of materials, built structures will be only partially screened from view due to the topography of the subject and surrounding lands. However, the magnitude of this impact will also be mitigated due to the construction works being located close to recently constructed large buildings. The impact of the proposals during construction on the view from this location would be considered ***negative, moderate*** in magnitude, and ***short-term*** in duration.

Visual impact of Proposed Development during operation

11.72 The Proposed Development will not result in any measurable visual impact on this view during operation. The substation building will be screened by the earthworks, trees and woodland planting to be installed under the Permitted Development.

View 4 – From minor road south-west of the site

Existing view

11.73 This view location is positioned along a minor access road located circa 394m south-west of the proposed substation site and is looking north-east towards the subject lands. The view would be considered of a moderate overall value. The foreground of the view is dominated by an existing post and rail fence, an iron farm access gate and associated scrub vegetation. Some boulders are lying idle in the foreground also which would impact negatively on the value of the view. In the mid-ground of the view there are many mature trees and some native hedgerow which are prominent and of moderate value. Much of the vegetation displayed in the view is associated with Newcastle Golf Centre, putting greens and flag poles are also visible in the view. These landscape elements along with the flat agricultural land displayed in the view typify the landscape typology in the local area.

Visual impact of Proposed Development during construction

11.74 The Proposed Development will result in a ***negative*** impact on this view during construction. The construction process, machinery, storage of materials and built structures will be only partially screened from view by the existing hedgerows and trees which are located between the viewpoint and the subject lands. However, the magnitude of this impact will also be mitigated due to the construction works being located close to recently constructed large buildings where similar construction activities were recently part of the visual landscape further to the east in the background of this view. The magnitude of the above negative effect would be considered ***moderate*** and ***short-term*** in duration.

Visual impact of Proposed Development during operation

11.75 The nature of the Proposed Development will result in a ***negative*** impact on this view during operation. However, the majority of the development will be screened from view by the earthworks, trees and woodland planting to be installed under the Permitted Development. Only a minimal part of the Proposed Development will be visible therefore the effect would be considered ***not significant*** and the duration would be considered ***long-term.***

View 5 – From the R120, north of the junction of the and R134

Existing view

11.76 This view is located approximately 460m south-west of the proposed substation looking towards the site. The view is a long-range view where the residential dwellings and associated vegetation create a visual screen, completely blocking the Proposed Development site.

Visual impact of Proposed Development during construction

11.77 The Proposed Development will not result in any measurable significant impact on this view during construction. The construction process, machinery, storage of materials, built structures will be screened from view by the existing vegetation and bunds.

Visual impact of Proposed Development during operation

11.78 The Proposed Development will not result in any measurable visual impact on this view during operation. The substation building and associated elements will be screened in their entirety by the existing vegetation, residential dwellings, local topography and distance from the viewpoint.

Conclusion

11.79 Landscape and visual effects arising from the Proposed Development during the construction phase will be ***moderate*** with an overall ***negative*** impact. The effects would be considered ***short-term*** in duration.

11.80 Landscape and visual effects arising from the Proposed Development during the operational phase will be ***not significant*** to ***imperceptible*** with an overall ***neutral*** impact. The effects would be considered ***long-term*** in duration.

Cumulative impacts

11.81 Cumulative effects were considered with regard to the Proposed, Permitted Developments and concurrent application on site. The operational phase of these developments will give rise to a noticeable change in the landscape character of the area. The initial removal of an agricultural field landscape to be replaced with built development would be considered a ***negative impact*** on the landscape character during the construction phase. The proposed landscape treatment under the Permitted Development along with the abeyant amendments under the Proposed Development would overtime cause this to change to a ***neutral impact***.

11.82 The landscape plan of the Permitted and Proposed Development will create significant belts of native woodland linking the existing hedgerows and trees into a much larger ecological habitat, including a native wetland to the west of the site. Similar treatment has been permitted, including a wetland area associated with other permitted development in the area.

11.83 The photomontages submitted with the Planning Application for the Proposed Development (See Appendix 11.2) present a view of the Proposed Development alongside both the Permitted Development and the concurrent application.

11.84 The Proposed Development will not extend the overall duration of construction activity within the area as it will be undertaken at the same time as the construction phases of the Permitted Development.

11.85 Construction activity will vary as different developments are completed in advance of others commencing. Cumulative effects will also intensify the change in character of the landscape from greenfield land to the nature of the Permitted and Proposed Developments; that will be further accentuated if the concurrent ICT Facility application is granted permission. Cumulative landscape and visual impacts for the construction phase will be ***moderate*** and ***negative*** as the existing land use changes to that anticipated by the land use zoning, however, these impacts will reduce to ***moderate*** and ***neutral*** as developments are completed and landscape mitigation measures are installed and established.

11.86 Cumulative effects during operation will gradually intensify the high-tech character of the development area and will introduce additional structures that will become visible to a greater or lesser extent

depending on their location and the location of the viewer. Cumulative landscape and visual effects for the operational phase are likely to be perceived initially as ***significant/moderate*** and ***negative*** as the existing land use changes to that anticipated by the land use zoning, however these will reduce to ***moderate*** and ***neutra*****l** as developments are completed and landscape mitigation measures establish. Cumulative landscape and visual effects are illustrated in the series of Accurate Visual Representations included in Appendix 11.2 for each of the representative views described in this chapter. Cumulative impacts are illustrated in the proposed version of each view and show the Proposed Development in combination with Permitted Development, as well as the concurrent application, as applied for, that is subject to a request for Additional Information from the Planning Authority.

12. TRAFFIC AND TRANSPORTION

12.1 This chapter of the EIA Report assesses the likely impacts in terms of vehicular, pedestrian and cycle access during the Construction and Operational Phases of the Proposed Development. This chapter has been prepared by John Ahearne MIEI from Martin Peters Associates Consulting Engineers (MPA Consulting Engineers).

12.2 The chapter describes the methodology used; the receiving environment, the characteristics of the Proposed Development, the potential impact which proposals of this kind would be likely to produce during both the Construction and Operational Phases; the remedial or reductive measures required to prevent, reduce or offset any significant adverse effects; and any residual impacts that may remain. The chapter also assesses the cumulative impacts of the Proposed Development with other permitted and committed development on the site as part of the overall assessment.

Methodology

12.3 The following methodology has been adopted:

- Review of relevant available information including, project plans, existing traffic information and other relevant studies;
- Review documentation associated with SD20A/0058 and SD20A/0324;
- Review plans prepared by ARC:MC, Clifton Scannell Emerson Associates and JB Barry Consulting Engineers;
- Review of 12-hour Manual Classified Turning Count Survey at the Peamount Road and Nangor Road Junction;
- Site visit to gain an understanding of the existing traffic and land use conditions;
- Define the proposal, including size, use, access arrangements, parking and staffing for the Construction and Operational Phases;
- Detailed estimation of the transport demand that will be generated by the proposal, both during the Construction and Operation Phases; and
- Assessment of the percentage impact of traffic on local roads / junctions, car parking requirements and accessibility of the site by sustainable modes including walking, cycling and public transport.

Receiving environment

12.4 This section considers the baseline conditions and considers the existing accessibility of the site by all modes of transport.

Proposed Development site location

12.5 The Proposed Development site is located approximately 14.5km to the west of Dublin City Centre. It is strategically located close to the realigned R134 (Nangor Road); Grange Castle Road (R136) that runs north south, linking the Lucan Bypass (N4) in the north to the Naas Road (N7) in the south, both of which connect with the M50 Dublin orbital Motorway. The site benefits from convenient access to the strategic road network, as detailed on Figure 12.1.

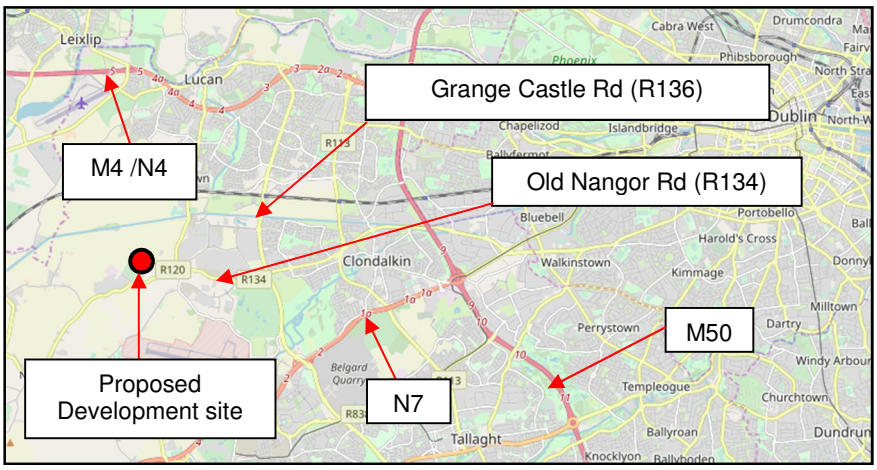

Figure 12.1 Proposed Development Site Location – Strategic (Source: OpenStreetMap)

12.6 As illustrated in Figure 12.1 and Figure 12.2, the Proposed Development site is located within the townlands of Milltown and Clutterland to the immediate west of Grange Castle South Business Park, and south-west of the original Grange Castle Business Park and some 500m from the junction between the R120 and R134.

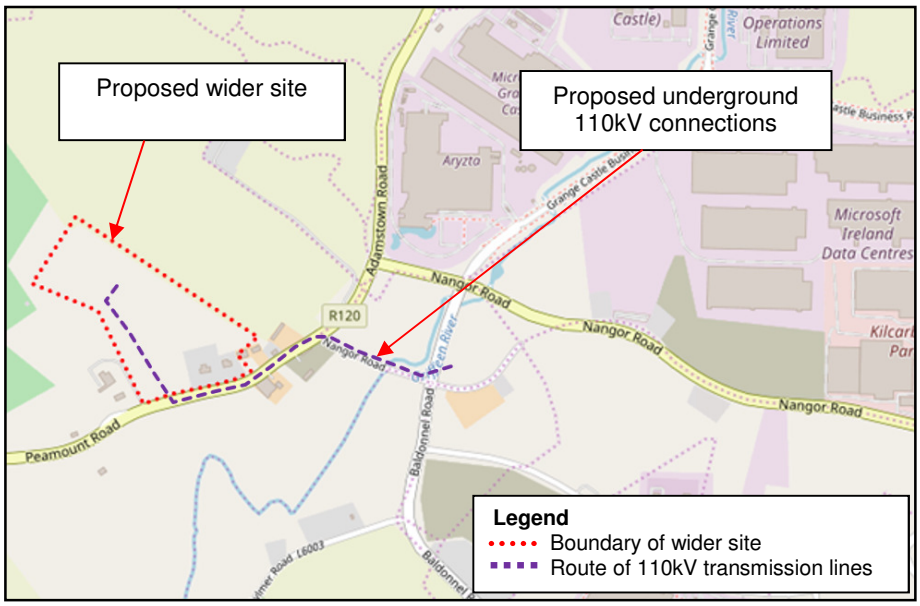

Figure 12.2 Proposed Development Site Location – Local (Source: OpenStreetMap)

Planning History relating to the Proposed Development site

12.7 Permission was granted to the north-west of the proposed substation for a gas-powered Power Generation Facility (PGF) on the 17th December 2020 under SDCC Reg. Ref. SD20A/0058. The Proposed Development is integral to the PGF as it will facilitate the export of power to the National Grid. The permission includes the vehicular access of the Peamount Road (R120) and the internal access road to the proposed substation that form part of the subject application site.

12.8 A concurrent application for an ICT Facility has also recently been lodged on lands to the immediate south-east of the proposed substation under SDCC Reg. Ref. SD20A/0324. This application is subject to a request for Additional Information from the Planning Authority. The response to the request will be made after the making of this SID application. The layout of the overall site in the context of the Proposed Development, with reference to its planning history, is illustrated on Figure 12.3

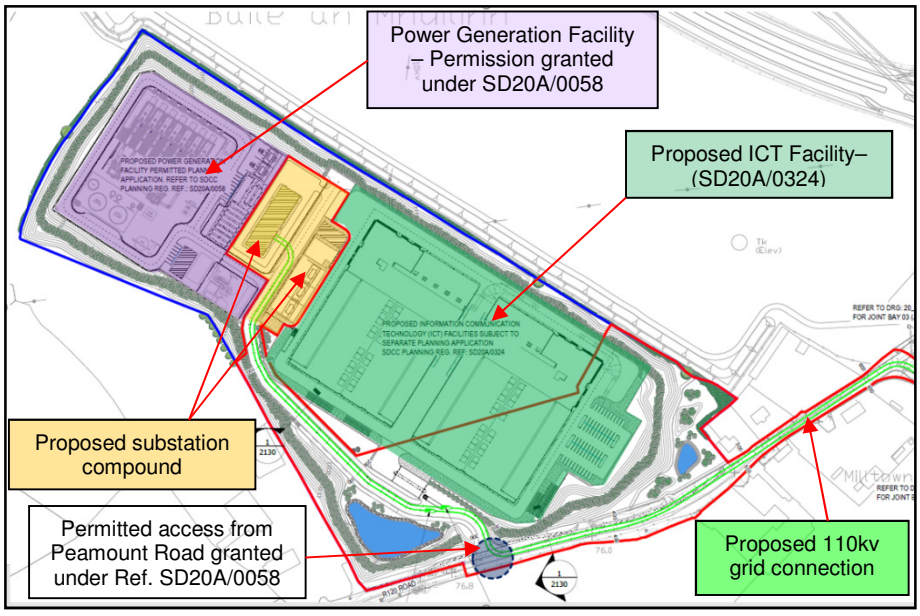

Figure 12.3 Wider Site - Planning History

Local Road Network

12.9 Peamount Road (R120) is a Regional Road that extends in a south-west to north-east alignment between Main Street, Newcastle, and Nangor Road (R134) where it continues north as Adamstown Road and terminates at the Leixlip Road / Lucan Road junction. Adjacent to the site, Peamount Road provides one traffic lane in each direction, has an approximate road carriageway width of 6.5 metres and has a posted speed limit of 60km/h.

12.10 Nangor Road (R134) extends in a west east alignment between Adamstown Road (R120) and the Naas Road (R810) / Long Mile Road junction in Walkinstown. Nangor Road, west of the Kilcarbery Park roundabout, has recently been re-aligned and new traffic signals have been constructed at the Baldonnel Road / Adamstown Road / Peamount Road and Nangor Road / Baldonnel Road junctions. Raised combined footway and cycle tracks are provided along both sides of the road (extending between the new Adamstown Road Junction and the Grange Castle Business Park access road roundabout junction).

12.11 The R136 (Outer Ring Road) links Tallaght to Lucan. The R136 forms a grade separated junction with the N4 approximately 3km north of its roundabout junction with Grange Castle Business Park, as well as the N7, approximately 3km to the south. The M50 is located 4kms to the east of the site and forms an orbital motorway ring road around Dublin. The M50 is intersected by the principal radial routes, including the N4 at Junction 7, and the N7 at Junction 9, also known as the Red Cow Interchange.

Local Improvement Works to the Road Network

12.12 The following road improvement works have been recently carried out in the area:

- Re-alignment of Nangor Road (R134), east of Adamstown Road (R120);
- Construction of a new three-arm signalised junction at Nangor Road (R134) / Adamstown Road (R120), replacing the previous priority controlled junction;
- Re-alignment and widening of the R120 (Adamstown Road), north of Old Nangor Road;
- Widening of the northernmost section of Baldonnel Road (L2001) and its extension north to meet the new alignment of Nangor Road;
- Delivery of a new traffic signals at the Baldonnel Road / Nangor Road junction, replacing the previous priority-controlled junction; and
- Reconfiguration of the three-arm priority junction of Baldonnel Road with Aylmer Road (L6003).

12.13 Refer to Figure 12.4 for details of the recent improvement works in the local area.

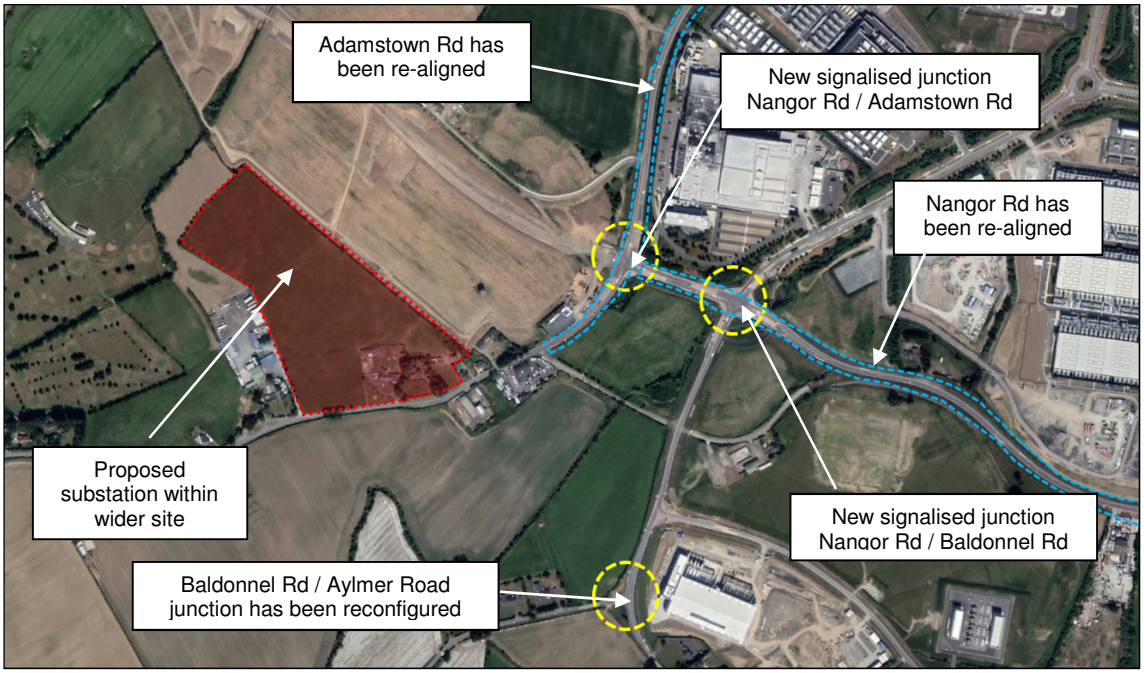

Figure 12.4 Recent infrastructure improvement works in the local area (Source: Google Earth)

Future Infrastructure Works

12.14 The *South Dublin Development Plan 2016-2022* includes, as a future transport objective, the westward extension of Nangor Road (R134), between Ballybane and Brownstown. This will connect Grange Castle with the future Western Orbital Route between the N7 and the N4. This new Grange Castle West Access Road has been permitted under a Part 8 application under Reg. Ref. SD188/0009. Work has commenced in 2020 at the entrance of these permitted roadway. Refer to Figure 12.5 for details.

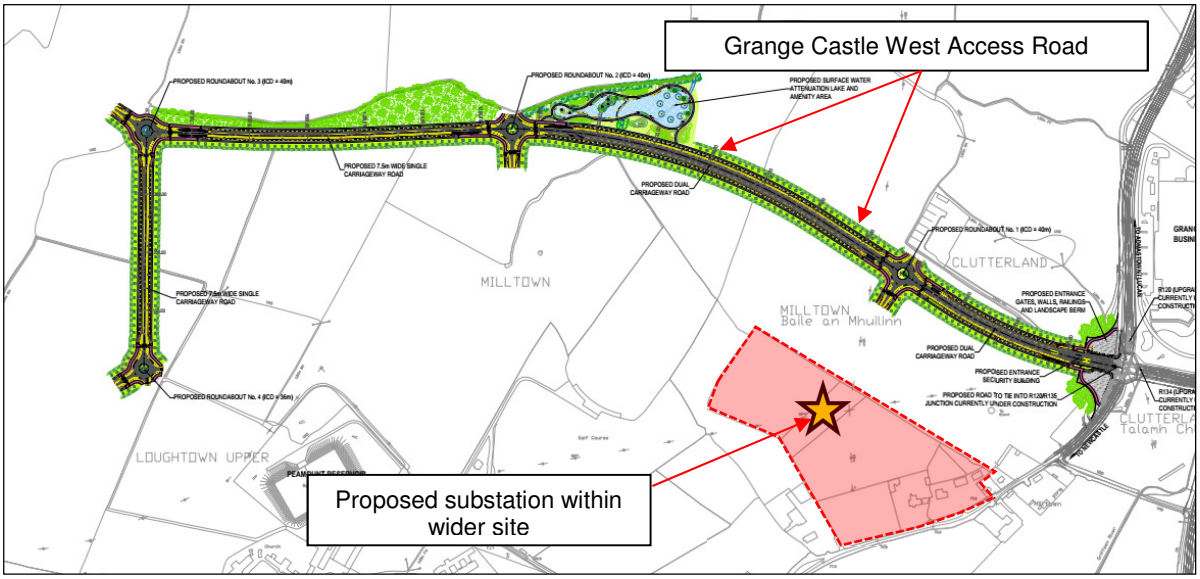

Figure 12.5 New Grange Castle West Access Road

Existing Traffic Volumes

12.15 A 12-hour Manual Classified Turning Count survey of the Peamount Road (R120) / Nangor Road (R134) Junction (Junction 2) has been conducted by Idaso Ltd, on behalf of MPA Consulting Engineers. The survey was conducted on Tuesday 1 October 2019.

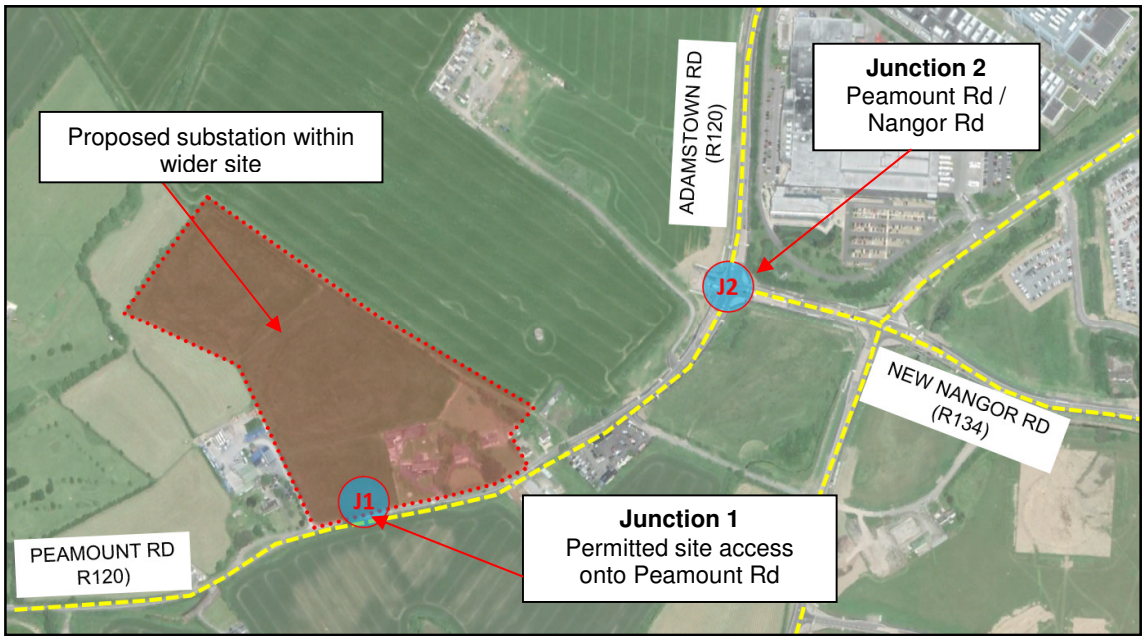

Figure 12.6 Junction 1 and Junction 2

12.16 The results of the survey is attached as Appendix 12.1 to this EIA Report. The surveys established that the typical weekday AM peak on Peamount Road is between 8:00AM and 9:00AM, while the PM peak hour is between 5:00PM and 6:00PM. Estimated traffic volumes for 2021 (present day) and 2023 (completion of construction works) have been derived by applying a growth rate to the base year (2019) traffic counts.

12.17 Annual growth indices were updated in May 2019 by the TII in the *'Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand projections (May 2019)'*. Table 12.1 below outlines the relevant growth factors to the base year traffic counts.

Table 12.1 Annual Growth Rates (Unit 5.3 – May 2019)

	Central Growth Rate (2016 - 2030	
Location	**Light Vehicles (LV)**	**Heavy Vehicles (HV)**
Dublin Metropolitan	1.0162	1.0295

12.18 For the purpose of estimating 2021 and 2023 traffic volumes, a growth rate of 1.0162 (Light Vehicles) has been applied to the 2019 traffic flows, as illustrated on Figure 12.7 and on Figure 12.8.

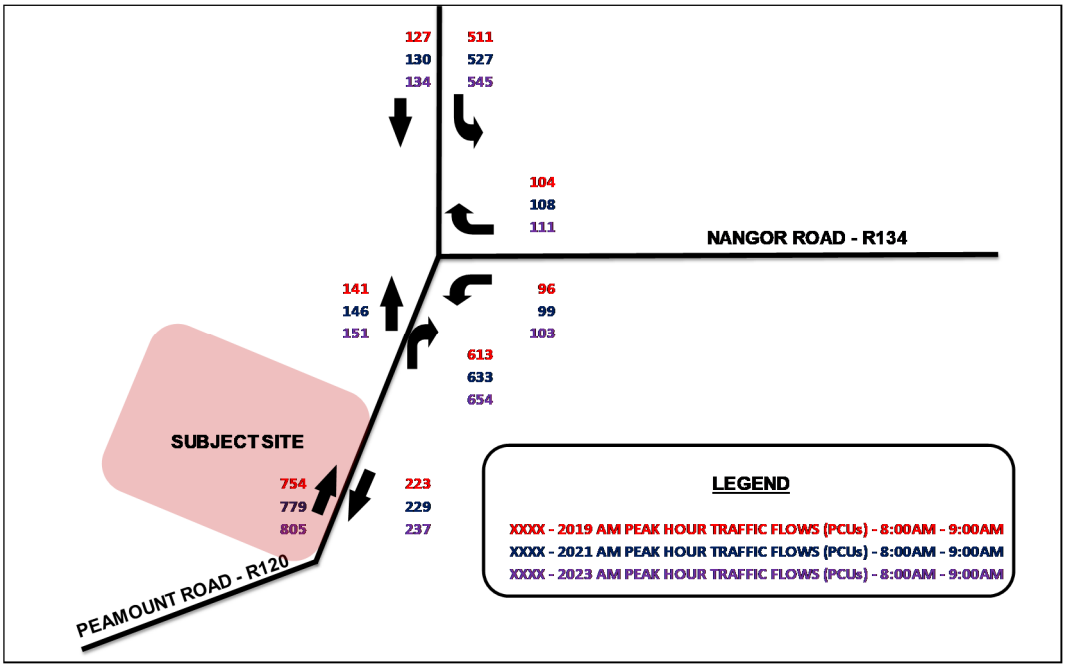

Figure 12.7 AM peak hour Traffic Flows (PCUs) at the Peamount Rd / Nangor Road Junction (8:00AM – 9:00AM)

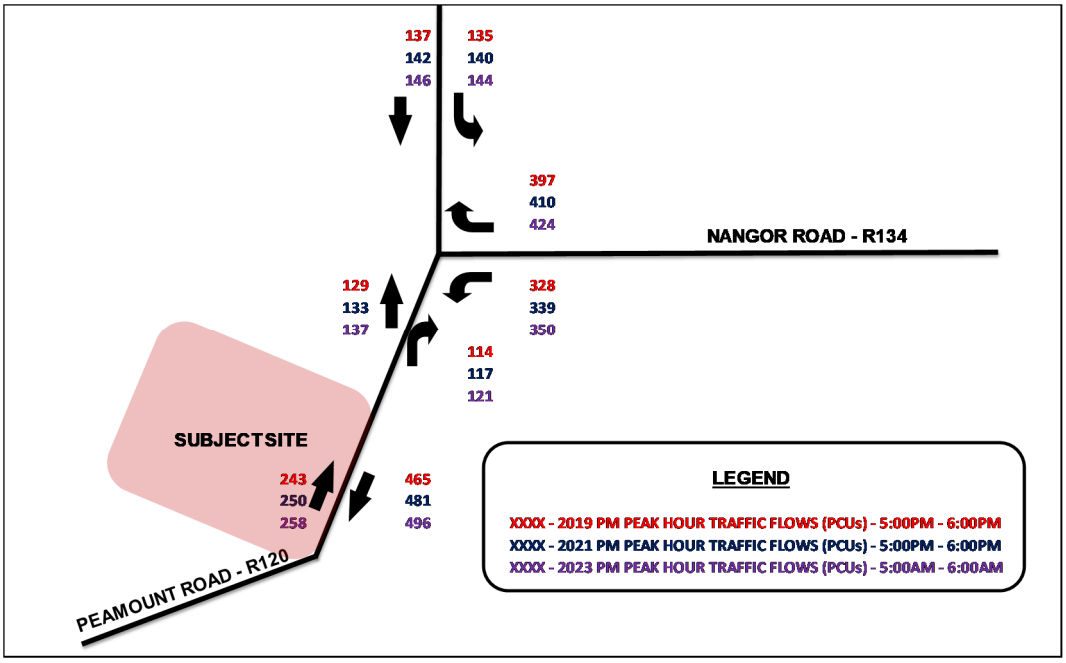

Figure 12.8 PM peak hour Traffic Flows (PCUs) at the Peamount Rd / Nangor Road Junction (5:00PM – 6:00PM)

12.19 Table 12.2 summarises the total traffic flows (PCUs) that pass the future site access junction (Junction 1) and the Peamount Rd / Nangor Road junction (Junction 2) during the critical AM and PM peak hour periods.

Table 12.2 Junction Traffic Flows (PCUs) during the AM and PM peak Hour Periods (2021 and 2023)

Critical Period	Junction1 2021 (PCUs)	Junction 2 2021 (PCUs)	Junction 1 2023 (PCUs)	Junction 2 2023 (PCUs)
AM Peak 8:00AM – 9:00AM	1,008	1,643	1,042	1,698
PM Peak 5:00PM – 6:00PM	731	1,281	754	1,322

Average Annual Daily Traffic (AADT) on Peamount Road (Without Development Traffic Flows)

12.20 The 12-hour traffic flows at the Peamount Road / Nangor Road junction have been converted to Annual Average Daily Traffic (AADT) flows using the Transport Infrastructure Ireland Project Appraisal Guidelines Document *'Unit 16.1: Expansion Factors for Short Period Traffic Counts'.* Table 12.3 outlines the AADT base flows (not including traffic flows from the development) for 2021 (present day) and 2023 (construction finishing year).

Table 12.3 AADT Traffic Flows (Without Traffic Flows from the Proposed Development)

Junction	Road	2021 AADT (Present Day)	2023 AADT (Construction Finishing Year)
Future Junction 1 Site Access to Peamount Road (R120)	R120 North	7,927	8,198
	Site Access	0	0
	R120 South	7,927	8,198
Junction 2 Peamount Road (R120) and Nangor Road (R134)	R120 South	7,927	8,198
	R120 North	8,406	8,702
	R134	10,460	10,823

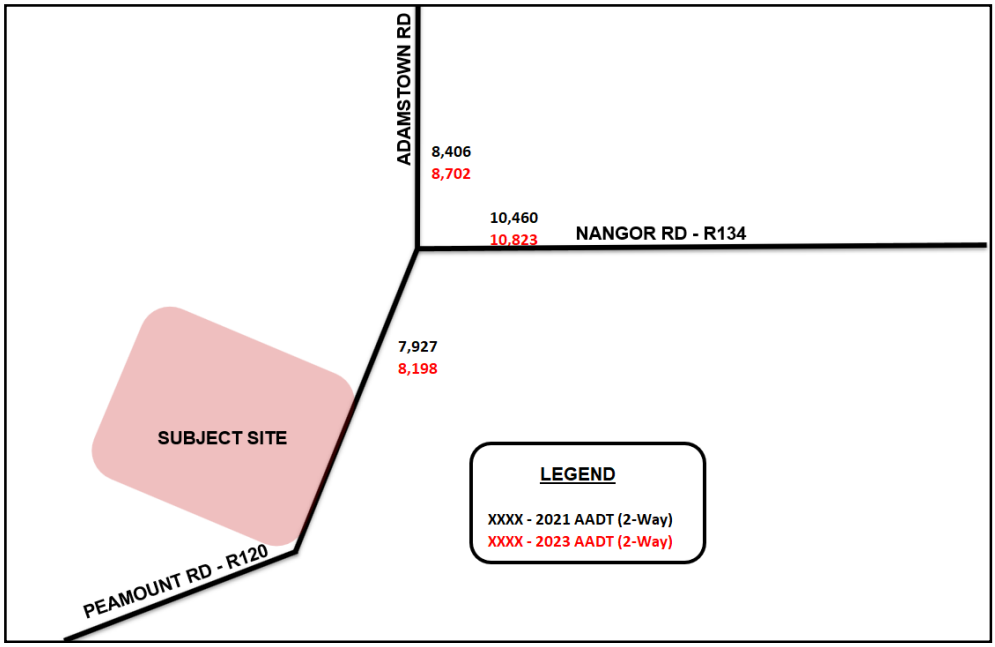

Figure 12.9 2021 and 2023 AADT (2-Way) on the surrounding road network

Access to Public Transport

12.21 The site has good access to the Dublin Bus Network and Bus Routes 68 and 13 are located within walking distance of the site. Bus Route 68 travels along the Peamount Road, with bus stops for both directions of travel available within close proximity of the future site access.

12.22 Route 68 bus runs from Hawkins Street in Dublin City Centre to Newcastle and the Greenogue Business Park. The service generally runs to an hourly frequency in both directions with the first bus out of Dublin passing the site at approximately 7:15AM and the last return bus into Dublin passing the site at approximately 10:35PM.

12.23 The current bus timetable is included in Appendix 12.2, with the route in proximity to the wider substation site shown below on Figure 12.10. Route 68 provides a genuine opportunity for future staff and construction personnel to use public transport when travelling to and from the site.

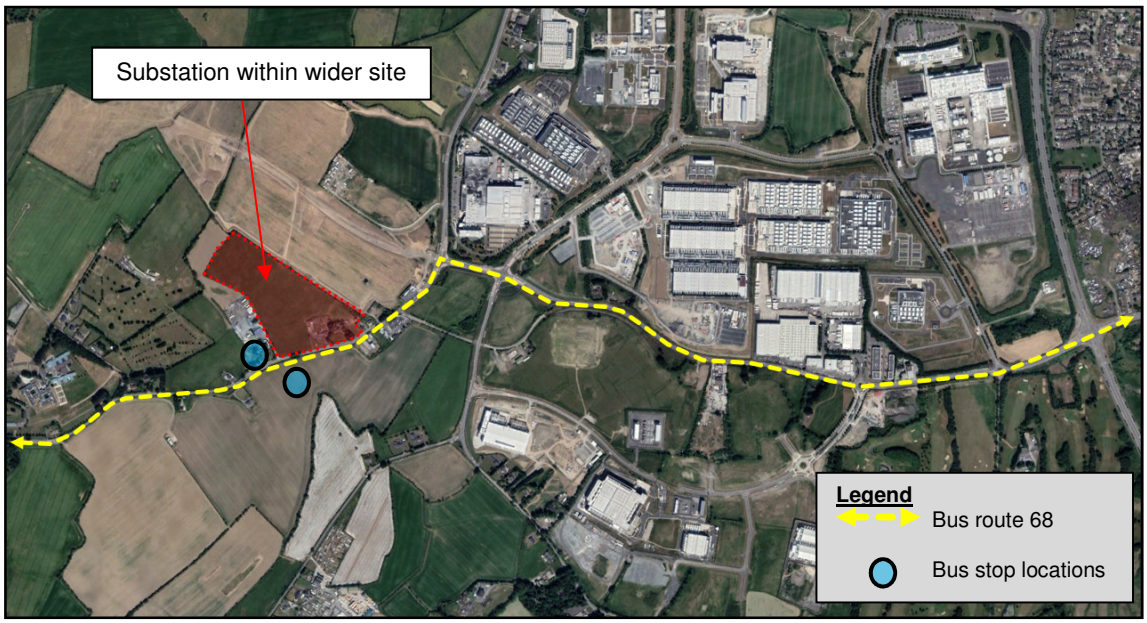

Figure 12.10 Bus Route 68 and Bus Stop Locations

12.24 Bus Routes 13 and 151 also serve Grange Castle Business Park further to the east, with Route 13 operating to a 15-minute frequency and the 151 operating to a 20-minute frequency. Route 13 runs from Harristown to Grange Castle via Dublin City Centre and Clondalkin Village with the Route 151 running from The Docklands to Lucan via Dublin City Centre, Clondalkin and Grange Castle Business Park. Current timetable information for these services is also attached as part of Appendix 12.2.

12.25 The closest stops for the number 13 and number 151 are approximately 1.2km and 2.3km walk from the site, respectively. Although providing good quality services to the local area, the walking distance between the site and the nearest stops may limit their day to day use by future staff and construction personnel.

12.26 The Dublin-Cork and Dublin-Limerick rail line runs some 2kms to the north of the site. Commuter services also run on this line with the nearest train station being Adamstown, approximately 3.4km walk from the site. This maybe too far for regular walking trips between the station and the site, however it would be suitable for train then cycle trips between the two.

Pedestrian Accessibility

12.27 There are no current footways available on the Peamount Road (R120) as it passes the site frontage. A footway of between 1.25m and 1.5m in width starts at the north-east corner of the site frontage with this continuing beside Peamount Road up to the previous Nangor Road junction. Here, the existing footway connects into a newly constructed high-quality footway that continues leading north and up to the recently constructed signal-controlled junction between Peamount Road, the realigned New Nangor Road and Adamstown Road.

12.28 The traffic signals at the New Nangor Road junction include dedicated pedestrian stages which enable pedestrians to cross all arms in a safe and convenient manner. High quality footways of approximately 1.5m width then continue north on both sides of Adamstown Road and east on both sides of New Nangor Road. These provide direct pedestrian routes to Adamstown, all parts of the Grange Castle Business Park and beyond towards Clondalkin and the wider local area.

Cycling Accessibility

12.29 Formal off-road cycle paths of approximately 1.5m width are available to the north of the proposed substation site along the Peamount Road and Adamstown Road approaches to the recently constructed R134 New Nangor Road junction. These continue north towards Adamstown and east beside the New Nangor Road through Grange Castle Business Park.

12.30 Segregated cycle routes are also available on both sides of the R136 Outer Ring Road with safe crossing facilities included within the traffic signal-controlled arrangement of the R134 New Nangor Road / R136 junction. East of this junction, cyclists are permitted to use the bus lane on New Nangor Road as it continues east towards Clondalkin and Dublin City Centre.

12.31 The Grand Canal Greenway runs east-west approximately 1.5km to the north of the site and can be accessed via the cycle paths beside the recently improved R120 Adamstown Road. It provides an off-road pedestrian and cycle route to Davitt Road, Inchicore and beyond towards the City Centre.

12.32 Cycling facilities in the vicinity of the site, and on routes towards the Greater Dublin area to the east, are considered to be particularly good. A cycling distance of approximately 5km takes in Newcastle, Clondalkin, Adamstown, Lucan and a large local population. Cycling is therefore likely to be an attractive mode of travel when accessing the site.

Road Safety Review

12.33 The Road Safety Authority's website has been reviewed (see extract below for Study Area) to identify the number of accidents that have been recorded on Peamount Road (R120) between the Peamount Lane (L60322) Junction and the Nangor Road Junction.

12.34 The traffic data has been obtained for the period 2005-2016, which is the most recent data available from the RSA website. Information relating to the period from 2017 to 2020 is not yet available on the Road Safety Authority (RSA) website and the records only detail accidents that have been formally recorded by An Garda Síochána. The recorded accidents have been categorised into one of the following class' of severity:

- Fatal
- Serious; and
- Minor.

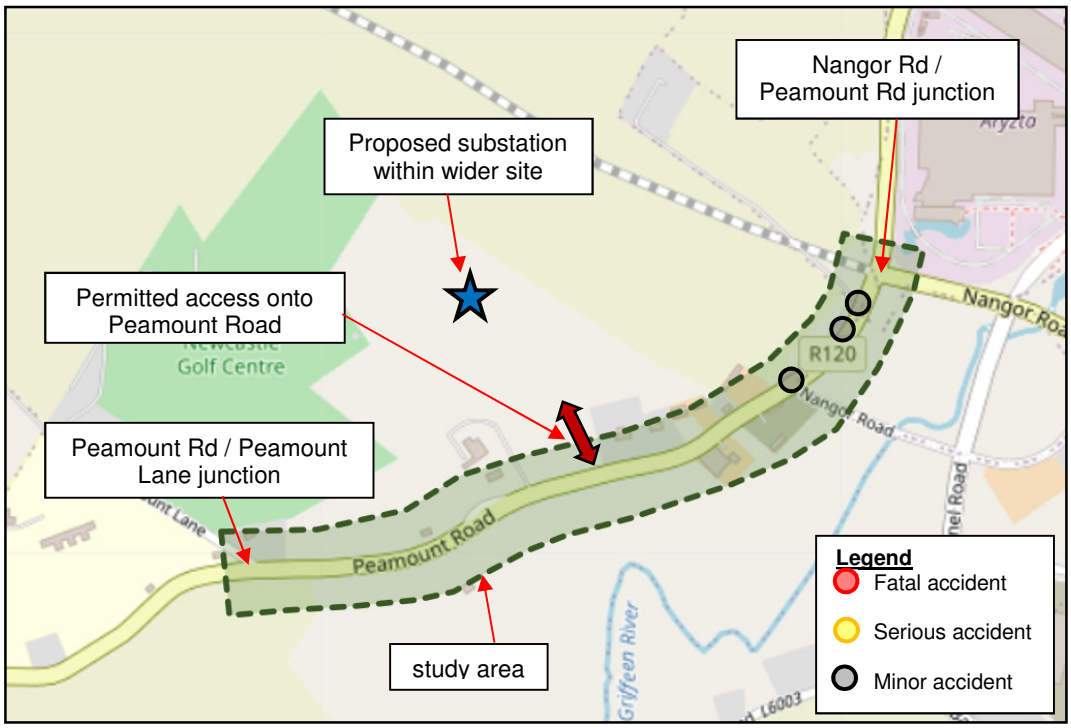

Figure 12.11 Accident History 2005 – 2016 from the Road Safety Authority (RSA) Database

12.35 The review indicates that there have been three (3) reported accidents within the Study Area over the 12-year period. A description of the accident history is presented below in Table 12.4.

Table 12.4 Accident History 2005 – 2016 from the Road Safety Authority (RSA) Database

	Location	Accident Year	Accident Severity	Number of Casualties	RSA Accident Description
1	Near the Old Nangor Rd Peamount Rd Junction	2010	Minor	1	Car involved in a head-on conflict. Details pertaining to the accident are not provided in the RSA Database
2	Immediately north of the Old Nangor Rd Peamount Rd Junction	2010	Minor	1	Goods vehicle involved in a single vehicle accident. Details pertaining to the accident are not provided in the RSA Database
3	North of the Old Nangor Rd Peamount Rd Junction	2015	Minor	1	Car involved in an 'Other' type accident. Details pertaining to the accident are not provided in the RSA Database

12.36 The RSA database indicates that there has been three 'Minor' accidents and no 'Serious' or 'Fatal' accidents within the Study Area between 2005 and 2016. Significant road improvement works, including the signalising of the Nangor Road / Peamount Road Junction and the re-alignment of Peamount Road have recently been carried out and safety benefits of these works have not been captured in the RSA database.

12.37 Nevertheless, given the 12-year period that the records cover and the traffic volumes on Peamount Road and Nangor Road, it is considered that the surrounding road network does not have any inherent road safety issues and the minimal additional traffic flows that will be generated by the proposal, both during the Operational and Construction Phases, will not lead to any material increase in road safety risks.

Characteristics of the Proposed Development

12.38 A full description of the proposed development is set out in Chapter 2 of this EIA Report.

12.39 The proposed GIS substation will include a two storey GIS substation building (GFA 1,430sqm). The proposed substation and transformer compounds will include 11 car parking spaces. These spaces will be used by maintenance staff.

12.40 The substation will not require any full-time staff to operate. Maintenance access to the substation will be required by the ESB, including a routine weekly inspection and a more comprehensive inspection once a year. The weekly inspection will take a maximum of eight (8) hours on a single day and will be conducted by up to two (2) maintenance staff. A more comprehensive maintenance inspection will take place annually. This will require up to four (4) maintenance staff to conduct testing at the substation over a maximum period of 15 days (120 hours).

12.41 Once installed, the underground transmission line will not require any staff to operate. Instead, two ESB Networks maintenance staff will carry out a routine inspection of the asset one (1) year after completion and once every three years thereafter.

Peamount Substation Car Parking Provision

12.42 The proposed substation compounds will deliver 11 car parking spaces. As noted earlier, the substation will not require any full-time staff and access to parking will be strictly limited to maintenance staff only. The provision (11 spaces) will comfortably meet the parking demand of maintenance staff and is deemed satisfactory.

Accessible Car Parking at Peamount Substation

12.43 *The South Dublin Development Plan 2016 – 2022* specifies that five (5) percent of car parking bays within any development be suitable for use by persons with disabilities, in compliance with Part M of the Building Regulations. It is recommended that one (1) standard car parking space (11 in total) is converted to an accessible space, to meet the above requirement.

Peamount Substation Bicycle Parking

12.44 It is envisaged that maintenance staff will access the site by car / van. Therefore, no bicycle parking is proposed for the Operational Phase of the substation.

Delivery Programme

12.45 The Project Team advised on the following Construction Programme:

- Subject to Planning, delivery of the 110kV GIS substation and 110kV transmission line connection will commence in Q4 2021 and finish in Q2 2023 (20-month programme);
- Construction will run in parallel with the delivery of the Power Generation Plan (commence in Q3 2021 and finish in Q3 2023) and ICT Facility (commence in Q3 2022 and finish in Q4 2023);
- The Construction Phase (Peamount Substation and cable connection) will not overlap with the Operational Phase of ICT Facility.

Potential Impacts of the Proposed Development

12.46 This section considers the possible types of effects a development proposal of this kind is likely to produce. The potential traffic and transport impacts of the development are considered below:

Construction phase

12.47 The construction traffic impacts of the proposal is dependent on the capacity of the local road network to facilitate access by staff cars and vans as well as HGV's and heavy construction machinery associated with the construction phase. The ability to accommodate temporary parking for contractors and storage of materials on site is another key consideration.

12.48 Construction will take place over a 20-month period, commencing in Q4 2021 and finishing in Q2 2023. Construction will be carried out in parallel with the delivery of the PGF (SDCC Reg. Ref. SD20A/0058) and works also have the potential to overlap with the construction of the concurrent application for the ICT Facility (SDCC Reg. Ref. SD20A/0324) if granted permission.

12.49 Work will be undertaken between the hours of 7:00AM and 7:00PM, from Monday to Friday and between 9:00AM and 1:00PM on a Saturday. Construction traffic has been estimated based on the Project Team's experience with similar proposals. The estimate considers the underground cable connection that will be installed beneath the Peamount Road (R120) road carriageway and Old Nangor Road easement. The on-road section extends for approximately 300 metres beneath the northbound carriageway of Peamount Road. This will require a staged closure of the northbound lane (staged in c. 100m sections at a time) of Peamount Road.

12.50 The underground cables will cross Peamount Road at the Old Nangor Road junction and will require a further staged closure of both the north and south bound lanes of Peamount Road. The underground cables will extend beneath the Old Nangor Road easement. The appointed Contractor will then drill beneath the Griffeen River and Baldonnel Road and connect to the Castlebaggot – Kilmahud Circuit.

12.51 The Project Team has provided the following relevant information for the Proposed Development:

- Peak construction personnel – 30 construction personnel;
- Assuming a 1.5 occupancy factor for private vehicles, construction personnel will generate up to 20 entry and 20 departure vehicle movements at the Peamount Road access on a daily basis; and
- Peak HGVs accessing the site – 10 entering and 10 leaving, on a daily basis.

12.52 Given that construction personnel will typically arrive before the AM peak hour period and depart after the PM peak hour period, the following analysis has conservatively assumed that 50 percent of all

construction personnel will arrive and depart during the AM and PM peak hour periods. It has also been assumed that up to two (2) HGV movements will enter and exit the site during the AM and PM peak hour periods respectively. The estimated Construction Phase trips are summarised in Table 12.5.

Table 12.5 Construction Phase Traffic during the AM and PM peak hour Periods

	Arrivals		Departures	
	Construction Personnel (Light Vehicles)	Heavy Goods Vehicles	Construction Personnel (Light Vehicles)	Heavy Goods Vehicles
AM Peak Hour (8:00AM – 9:00AM)	10	2	0	2
PM Peak Hour (5:00PM – 6:00PM)	0	2	10	2

12.53 As outlined above, 14 construction trips are estimated at the Peamount Road access during the critical AM and PM peak hour periods.

Construction Phase (Substation, Underground Cable Connection, ICT Facility and Power Plant)

12.54 Previous work, carried out by MPA Consulting Engineers (Planning Reference SD20A/0324), has estimated that the ICT Facility and PGF will generate up to 95 inbound and outbound construction trips during the AM and PM peak hour periods respectively. The development, as a whole, will therefore generate the following number of construction trips during the critical AM and PM peak hour periods.

Table 12.6 Cumulative Construction Phase Traffic during the AM and PM peak hour Periods

	AM Peak Arrivals and Departures (Vehicles)	**PM Peak Arrivals and Departures (Vehicles)**	**Daily Trips (Vehicles)**
Substation and Cable Connection Construction Traffic	14	14	100
ICT Facility and Power Plant Construction Traffic	95	95	190
Cumulative Trips	**109**	**109**	**290**

Traffic Impact

12.55 Having regard to the surrounding road network, it has been assumed that at the Peamount Road (R120) site access, 25% of construction traffic will travel to and from the south-west and the remaining 75% will travel to and from the north-east. At the Peamount Road and Nangor Road junction, it is assumed that 50% of construction traffic will travel to and from the east, with the remaining 25% travelling to and from the north via Adamstown Road. The development's construction traffic trip distribution, during the AM and PM peak hour periods, is presented on Figure 12.12.

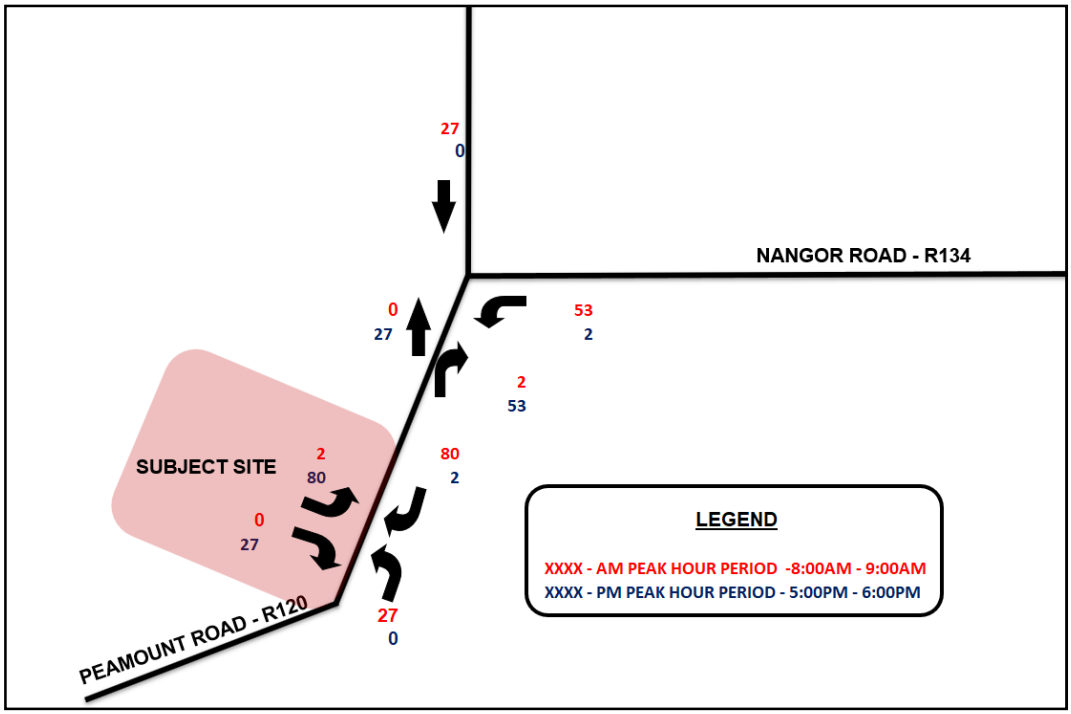

Figure 12.12 Construction Traffic Trip Distribution (combined Substation, Power Plant and ICT Facility) during the AM and PM peak Hour Periods.

12.56 In accordance with the *TII's 'Traffic & Transport Assessment Guidelines',* the proportional increase in traffic levels at Junction 1 and Junction 2 has been assessed and is identified in Table 12.7.

Table 12.7 Construction Traffic Impact on nearby Junctions - 2023

Junction	2023 No Development Traffic Flows (PCU) (AM/PM)	2023 With Development Traffic Flows (PCU) (AM/PM)	Percentage Increase (AM/ PM)
Junction 1 DUB40 Site Access onto Peamount Road (R120)	1,042 / 754	1,151 / 863	10.5% / 14.5%
Junction 2 Nangor Road (R134) / Peamount Road (R120)	1,698 / 1,322	1,780 / 1,404	4.8% / 6.2%

12.57 The Transport Infrastructure Ireland document *"Traffic and Transport Assessment Guidelines"* states that the impact of any proposed development on the local highway network is considered material when the level of traffic it generates increases flows by more than 10% on normal networks or five (5) percent on congested networks. When these levels of flow increase are generated, a more detailed assessment of the network performance is necessary by undertaking junction capacity assessments.

12.58 As outlined in Table 12.7, the level of impact at Junction 2 will not exceed the 10% threshold either during the AM and PM peak hour periods. A more detailed assessment of the junction capacity is therefore not deemed necessary. It is accepted that the level of impact at Junction 1 may exceed 10% during the AM and PM peak hour periods. However, a detailed junction analysis is not considered necessary for the following reasons:

- The construction phase traffic analysis for the concurrent Planning Application SD20A/0324 (ICT Facility) has conservatively assumed that all construction personnel (95 vehicles movements) will arrive and depart during the AM and PM peak hour periods. Given that the site working hours will be between 7:00AM and 7:00PM, it is expected that the vast majority of construction personnel will arrive before 7:00AM and therefore before the AM peak hour period (8:00AM -9:00AM) and depart after 7:00pm and therefore after the PM peak hour period (5:00PM – 6:00PM);

- Assuming that 50 percent of construction traffic associated with the ICT Facility and Power Plant arrive and depart during the AM and PM peak hour periods, the level of impact at Junction 1 is reduced to six (6) percent during the AM peak hour period and 8.2 percent during the PM peak hour period. This assessment is considered to be more realistic given that it is known that the majority of construction personnel will arrive before 7:00AM (work commences) and depart after 7:00PM (site shutdown);
- The initial analysis estimates 109 turning vehicle movements at Junction 1 during the AM and PM peak hour periods respectively. This level of traffic flow equates to an average of only 1.8 additional vehicle movements every minute during the AM and PM peak hour periods. This level of additional traffic is minimal in traffic engineering terms and is not perceptible to the average motorist;
- A detailed assessment of the Junction, using PICADY, has been carried out as part of Planning Application SD20A/0324 for the Operational Phase. The assessment has been found that the junction will operate with a Level of Service A and the maximum Ratio of Flow Capacity (RFC) will not exceed 0.12 up to the 2038 Design Year. Having reviewed the PICADY model, we are satisfied that construction related traffic accessing the site will have a minimal impact on traffic flows on Peamount Road; and
- It is accepted that the partial lane closures, to facilitate the installation of the underground transmission lines will temporarily impact traffic flows on Peamount Road. The traffic impact will be short term and will be carefully managed by the appointed contractor in close consultation with South Dublin County Council.

12.59 In light of the above, there overall traffic impact of the Construction Phase (cumulative) is ***short-term negative and not significant***.

Do-Nothing Scenario

12.60 The do-nothing scenario would have no impact on traffic in the area.

Operational phase

12.61 As outlined previously, the substation will not require full time staff and access will be limited to a weekly inspection by ESB staff (maximum of two staff) and a more comprehensive inspection once a year. The substation is estimated to generate up to four (4) daily vehicle movements during the weekly ESB inspection and up to eight (8) daily vehicle movements during the annual inspection.

12.62 The operational traffic impact of the substation will therefore be minimal, and the traffic flows will be clearly below the thresholds set out in the Transport Infrastructure Ireland (TII) document '*Traffic & Transport Assessment Guidelines May 2014'*. The underground transmission line connection is expected to have a limited impact on traffic during its Operational Phase.

12.63 The transmission lines will be inspected one (1) year after installation and once every three (3) years thereafter. The traffic impact of the Operational Phase of the proposal is ***long term neutral*** and ***imperceptible***, with the operational traffic flows substantially below the threshold set out in the TII document *'Traffic & Transport Assessment Guidelines May 2014'*.

Do-Nothing Scenario

12.64 The do-nothing scenario would mean that the ICT Facility could not proceed as the substation and transmission line connection is integral to the overall development proceeding. Peamount Road (R120) and the surrounding infrastructure would remain in its current state and background traffic would grow over time. Given the location of the site and its close proximity to the industrial parks in Grange Castle, it is reasonable to assume that a development, potentially with an equal or more intensive requirement for vehicular trips, would be established on this site at some stage in the future.

Remedial and mitigation measures

Construction phase

12.65 A detailed Construction Traffic Management Plan (CTMP) will be prepared by the appointed lead contractor. The CTMP will consider the safety and operational impact on construction traffic from all

phases of the development and will pay particular attention to:

- Routes to be used by vehicles;
- Working hours of the site;
- Details of construction traffic forecasts;
- Times when vehicle movements and deliveries will be made to site;
- Facilities for loading and unloading;
- Facilities for parking cars and other vehicles; and
- Details of lane closures.

12.66 The lead contractor will be required to appoint a dedicated construction manager and construction traffic manager. The construction traffic manager will be required to coordinate and schedule all deliveries to the site, ensure that roadways are kept clear of mud and debris, advise haulage contractors on routes, and adhere to good traffic management principles.

12.67 The following measures will also be implemented:

- The contractor will be required to provide wheel cleaning facilities, and regular cleaning of the main access road;
- Temporary car parking facilities for the construction workforce will be provided within the site and the surface of the car park will be prepared and finished to a standard sufficient to avoid mud spillage onto adjoining roads;
- Monitoring and control of construction traffic will be ongoing during construction works; and
- Construction traffic will be minimised during peak hours.

Operational phase

12.68 The potential traffic impact associated with the operational phase of the Proposed Development will be ***long-term neutral and imperceptible.*** The traffic impact during the operational phase is minimal and expected traffic flows will be significantly below the thresholds set out in the Transport Infrastructure Ireland (TII) document '*Traffic & Transport Assessment Guidelines May 2014'*.

12.69 Therefore, no further mitigation measures are proposed on the public road to facilitate this phase of the development.

Predicted Impacts of the Proposed Development

12.70 Mitigation measures discussed above, will be put in place to offset any potential traffic impacts associated with the development. Therefore, the predicted impact of the development will be ***short-term, negative and not significant*** for the construction phase, and ***long-term, neutral and imperceptible*** for the operational phase.

Residual Impacts

12.71 The residual traffic impacts of the development will be ***neutral*** and ***imperceptible***.

13. CULTURAL HERITAGE

13.1 The following report was prepared by CRDS Ltd. on behalf of Data and Power Hub Services Limited. It assesses the archaeological and cultural heritage impacts of a proposed Electricity Transmission Development on lands to the in the townland of Milltown and Clutterland, Co. Dublin. The main development site is located on the northwest side of the R120 road, with a spur to the southeast, to the west of Grange Castle South Business Park and to the south of the Grand Canal (see Figure 1 – please refer to appendix 13.4 for all illustrations).

Methodology

13.2 For the purpose of setting the site within its wider archaeological and cultural heritage landscape, a desk-based assessment utilising sources including the Record of Monuments and Places, the National Museum of Ireland topographical files, the database of licensed excavations, the Record of Protected Structures included in the South Dublin County Council Development Plan 2016-2022, the National Inventory of Architectural Heritage, documentary and cartographic sources was undertaken. The desk-based assessment was supplemented by a full site survey and a geophysical survey undertaken by John Nichols of Target Ltd in September 2019 (Licence No. 19R0190).

Recorded Archaeological Monuments and Places

13.3 The Record of Monuments and Places was consulted for the relevant parts of the county. This is a list of archaeological sites known to the National Monuments Service (see www.archaeology.ie). The relevant files for these sites contain details of documentary sources and aerial photographs, early maps, OS memoirs, OPW Archaeological Survey notes and other relevant publications. The list of National Monuments in State Ownership or State Guardianship, the Register of Historic Monuments, the Sites and Monuments Record and monuments covered by Preservations Orders were also assessed. All sites within c. 2km of the development were identified and are listed in Appendix 13.1 (see Figure 2 for locations).

Recorded archaeological finds

13.4 Published catalogues of prehistoric material were studied: Raftery (1983 - Iron Age antiquities), Eogan (1965; 1993; 1994 - bronze swords, Bronze Age hoards and goldwork), Harbison (1968; 1969a; 1969b - bronze axes, halberds and daggers) and the Irish Stone Axe Project Database (School of Archaeology, UCD). Finally, the excavations data base (see below) identified large numbers of artefacts discovered in the course of archaeological investigations in advance of previous development in the area.

Cartographic sources

13.5 Reference to cartographic sources provides information on the development of the area. Manuscript maps consulted included the Down Survey Barony map of Newcastle and Uppercross, c. 1656, Rocque's map of 1760 and Taylor's map of Dublin 1816. Ordnance Survey maps consulted included 6" maps, first and later editions and the Ordnance Survey 25" maps. (see Figures 3-5 of Appendix 13.1).

Previous excavations

13.6 The Excavations bulletin website (www.excavations.ie) was consulted to identify excavations that may have been carried out within or in the vicinity of the development. This database contains summary accounts of excavations carried out in Ireland from 1970 to 2018. The study area has been subject to a number of licensed excavations during the development of the Grange Castle Business Park and during improvements to the R120 Adamstown Road and summaries of these are listed in Appendix 13.2.

Aerial Photographs

13.7 Available on-line aerial photographs for the area of the Proposed Development site were assessed, including Google Maps, TCD, OSI, GSI and Archaeology.ie platforms. An aerial photograph of the area is included as Figure 6 of Appendix 13.1.

Architectural Heritage

13.8 The National Inventory of Architectural Heritage (NIAH) is a systematic programme of identification, classification and evaluation of the architectural heritage of the State. The Minister for the Culture, Heritage and the Gaeltacht is currently using the Inventory as the basis for making recommendations for the inclusion of structures in the Record of Protected Structures (RPS). The South County Dublin Development Plan 2016 – 2022 consulted. The plan includes policy objectives for the protection of the county's architectural heritage through their inclusion in the Record of Protected Structures (RPS) or in Architectural Conservation Areas (ACA). The RPS is a list of every structure which is of special architectural, archaeological, artistic, cultural, scientific, social or technical interest within the council's functional area. All sites within c. 1km of the development were identified and are listed in Appendix H.3 (see Figure 7 in Appendix 13.1 for locations). Two structures included in the NIAH are located adjacent to the route of the Proposed Development along the R120 (NIAH Nos 11208006 (outbuilding) & 11208016 (public house)). Neither will be directly impacted by the Proposed Development.

13.9 The South County Dublin Development Plan 2016 – 2022 includes policy objectives for the protection of the county's architectural heritage through their inclusion in the Record of Protected Structures (RPS) or in Architectural Conservation Areas (ACA). The RPS is a list of every structure which is of special architectural, archaeological, artistic, cultural, scientific, social or technical interest within the council's functional area. No structures included in the RPS are located within the site.

13.10 Historical background research commenced with an inspection of the Hayes's index of manuscripts and periodicals (Hayes 1965; 1970). Other sources consulted included the Civil Survey for County Dublin c.1654-56 (Simington, 1940) and Lewis's Topographical Dictionary of Ireland (1837). See Appendix 13.5 for a full list of references and consultations.

Receiving environment

13.11 The study area, which comprises a distance of 2km from the Proposed Development, is characterised by upstanding archaeological monuments dating to the medieval period. Archaeological excavations in the area have also uncovered a number of prehistoric sites. All recorded archaeological monuments and features noted below are located outside the site boundary.

13.12 The earliest evidence for settlement consists of the remains of a Neolithic house excavated in the townland of Kishoge to the north-east of the site. The house was roughly rectangular in shape and measured 6.05m in length by 4.5m in width. The walls comprised a foundation trench supporting oak posts and planking and it may have been subdivided internally. Domestic activity in the vicinity of the dwelling comprised pits and charcoal and a number of artefacts were recovered from these features including scrapers, waste flint and a single sherd of prehistoric pottery. Radiocarbon dates from the site indicate a Neolithic date between 3941 and 3659 BC (Excavation ref. no. 01E0061, see Appendix 13.2).

13.13 Excavations in the townland of Kilmahuddrick to the south-east of the Proposed Development revealed the remains of a ploughed-out ring-barrow. Ring-barrows are generally characterised by a low, artificial mound, sometimes with an encircling ditch and bank. The excavation at Kilmahuddrick revealed a large ditch and a series of cremated bone deposits at its centre (Doyle 2005, 43). The site had been intensively ploughed in the past and no trace of the raised central mound was present. Radiocarbon dates indicated that the site originated in the early Bronze Age but its use continued into the later Bronze Age and Iron Age (Doyle 2001, 17). The site was later enclosed within a field system of early medieval date (see below). A series of cremated human deposits were uncovered within the interior of the barrow ditch associated with finds including undecorated pottery and a small black glass bead (Doyle 2001, 18).

13.14 A number of fulacht fiadh have also been revealed within the townlands of Nangor and Grange. Fulacht fiadh or burnt mounds comprise mounds of charcoal rich soil, heat-fractured stones accompanied by

a trough sometimes lined with wooden planks, stone slabs or even clay (Waddell 2000). They are generally located close to water sources including streams, rivers, lakes or marshy ground. The exact use of these sites is still somewhat ambiguous with their traditional interpretation as cooking places coming into question in recent years. They date predominantly to the Bronze Age but date ranges from the Mesolithic period to the medieval period have been returned.

13.15 The remains of a field system was found enclosing a prehistoric ring-barrow in the townland of Kilmahuddrick (Doyle 2005, 43). The field system was represented by a series of linear features on the western and southern sides of the ring-barrow. Radiocarbon dates from deposits of animal bone indicated that the field system dated to the early medieval period (Doyle 2005, 52). A further series of pits and ditches of early and later medieval date were revealed during excavations in the townland of Nangor (Doyle 2001).

13.16 The place name Kilmahuddrick provides an additional indicator of early medieval activity in the vicinity of the Proposed Development. The place name contains the element 'Kil' an Anglicisation of Cell or Cill generally signifying an early medieval church (Doyle 2005, 45). The church of Kilmahuddrick was dedicated to St. Cuthbert and consists of a nave-and-chancel church situated in a disused burial ground (Ní Mharcaigh 1997, 270).

13.17 Ringforts, the characteristic settlement site of the early medieval period, generally consist of a circular area surrounded by a bank or fosse, or simply by a rampart of stone. Ringforts are usually interpreted as being defended farmsteads. Many ringforts have been partially or completely destroyed since the 1960s and often the only indication of the former presence of a ringfort is preserved in townland name elements such as Dún, Rath, Cashel or Lios. However, monuments which have experienced above-ground disturbance continue to be of archaeological interest due to the potential for subsurface remains to exist at their locations. The term 'enclosure' is applied to monuments that cannot be classified more accurately without archaeological assessment but were identified as enclosures during fieldwork or through the study of aerial photography or other sources. There are four enclosures within the study area including one in the townland of Gollierstown (DU017-093----), one in the townland of Kilmactalway (DU021-112----) and two in the townland of Ballybane (DU021-108---- and DU021-109----). The sites of the two enclosures in Ballybane were subject to archaeological test excavation in 2016 (Excavation ref. no. 16E0531, see Appendix 13.2). AH1 (DU021-108----) comprised internal and external ditched enclosures with internal linear features and pits, likely representing an early medieval settlement site. AH5 (DU021-109----) measured c. 44m in diameter and comprised a single-ditched circular enclosure, a possible ringfort.

13.18 There is extensive archaeological and documentary evidence for the later medieval settlement of the study area. Records show that the Cistercian abbey of St. Mary's held lands in the vicinity of Clondalkin, including the townlands of Ballymacheilmer and Kilmacuddrick (now Kilmahuddrick) from the 12th century. The name Kilmahuddrick is derived from Cell Mo-Chudric or the church of St. Cuthbert. The lands may have come into the abbey's possession before the arrival of the Normans but the possession of Ballymacheilmer was confirmed to the abbey in two charters of Henry II dating to 1174 and 1197. John Comyn, Archbishop of Dublin confirmed the lands, chapel and titles in 1186.

13.19 At the time of the dissolution the 'Grange of Balichelmer' and the 'vil of Kilmacodryke' were still listed as part of the abbey's landholdings. The Grange of Balichelmer is likely to correspond with the modern townland of Grange. One hundred and fifty-two acres at Grange were listed in the monastic possession at the time of the dissolution of the monasteries c. 1540-41. In 1641 Grange was in the hands of the Fagan of Feltrim, an Irish Papist (Simington 1945, 304). In 1650 Grange was occupied by a farmer called Nicholas Wolverston and twenty other persons, including a weaver and a 'greymerchant'. The 'vil of kilmacodryke' corresponds with the townland of Kilmahuddrick to the immediate south-east of the Proposed Development. At the time of the dissolution the holding at Kilmahuddrick comprised 51 acres. In 1641 Kilmacuddrick was held by Mr Aylmer an Irish Papist (Simington 1945, 304). In 1666, the lands of Kilmahuddrick were held by Patrick Thunder (Ball 1906, 71).

13.20 Several tower houses were constructed in the study area in the later medieval period including one in the townland of Grange (DU017-034----) and one in the townland of Adamstown (DU017-029----). Tower houses are small, fortified residences which were constructed following a period of unrest in the fourteenth century. Tower houses have various defensive features including thick walls, battlements and narrow windows. As time progressed and the requirement for defence lessened tower houses

were replaced by hall houses and fortified residential houses. Residential extensions were also added to existing tower houses to provide more comfortable accommodation for the occupiers.

13.21 The upstanding remains of Grange Castle (DU017-034----) are located c. 2.5km to the north-east of the Proposed Development and consist of a rectangular, three-storey structure with plastered walls. Grange Castle is shown on the Down Survey map (see Figure 3 of Appendix 13.1). An early description by Cooper in 1780 describes the castle as a 'neat well built castle inhabited by a farmer and kept in very good repair'. The castle is uninhabited and had fallen into disrepair but is currently subject to a programme of conservation by South Dublin County Council. Archaeological excavation undertaken adjacent to the castle in 1997 revealed a curving ditch containing charcoal, mortar, flint and animal bones. Finds including a decorated bone comb, stick-pin and knife provided a twelfth to thirteenth century date. Preliminary works undertaken in 2016 in advance of planned conservation works revealed that the tower house and later Georgian house possess shallow foundations. (Excavation ref. no. 97E0116ext and 16E0510 see Appendix 13.2).

13.22 In the mid-eighteenth century a group of noblemen and merchants decided to form a company to undertake the construction of a canal aimed initially at providing fresh water for Dublin City and a water-borne transport system to the countryside west of Dublin. Work began on the Grand Canal and the canal was opened for traffic in February 1779 (Delaney 1995, 21). The Grand Canal runs northeast to southwest, approximately 1km to the north of the site. A complex of canal related structures was constructed including the 12th Lock itself, the lock keeper's house built to the designs of the Grand Canal Company's engineer Thomas Omer and Leck Bridge which has been widened to facilitate modern traffic requirements. A number of industrial buildings were constructed alongside the canal including two nineteenth century mill buildings.

13.23 A review of available cartographic sources indicate that this area has been farmland comprising large, open fields, up until the relatively recent past (see Figures 4-5 of Appendix 13.1). The Griffeen River, visible on the 1st (Figure 4) and 2nd (Figure 5) edition Ordnance Survey Maps runs to the south-east of the site and is crossed by the south-eastern portion of the Proposed Development (see Figure 1). The Griffeen river is associated with milling in the area, notably in Grange (see Appendix 13.2; excavation number 2003:0604), where surface evidence of a mill in the form of the north wall, surviving as part of the boundary fence separating the Beattie farm from the Grand Canal towpath.

13.24 The townland name 'Milltown' along with the complex of eighteenth and nineteenth century buildings on the southern side of the R120 (see Figures 4, 5 and 7 of Appendix 13.1), including NIAH structures (NIAH Nos 11208006 (outbuilding) & 11208016 (public house)), close to the Griffeen River, suggests milling activity occurred in this area.

13.25 The area has been subject to intensive farming practices, and it is likely that this has resulted in the destruction of the above ground expression of other sites.

Site assessment

13.26 The portion of the site to the northwest of the R120 was visited in September 2019 in cloudy, dry weather. The site assessments involved the examination of recorded archaeological and cultural heritage constraints and the identification of previously unrecorded features of archaeological and cultural heritage interest within the site. No features of finds of archaeological interest were noted.

13.27 The portion of the site along the R120 and to the southeast of it is predominantly on existing roadway.

Geophysical survey

13.28 High resolution magnetic gradiometer survey was conducted by John Nichols of Target Ltd (Licence No. 19R0190 issued by the Department of Culture, Heritage and the Gaeltacht). The aim of the geophysical survey was to locate and identify any responses of potential archaeological interest within the site. The survey area totals c. 6.4 hectares and is contained within four fields (see Figure 8 of Appendix 13.4; Please refer to Appendix 13.5 for full results and reference to points below). Please note that this survey was restricted to the portion of the site on the northwest side of the R120.

M1

13.29 Remnants of a former boundary traversing M1 NW-SE are evident W of survey centre, with responses from past cultivation visible as parallel linear responses aligned mostly NW-SE. Fragmented and poorly defined curvilinear anomalies (1-2), c.90m at their greatest extent, which extend through the western portion of M1, may be of archaeological interest, perhaps forming part of a levelled enclosure. However, the potential that anomalies 1-2 may derive from more recent equestrian activity within the site boundary should not be excluded, Google aerial imagery indicating a large circular exercise ring to the SE in M2. Magnetically weak small-scale positives and weak trends of possible significance are also evident in M1, notably W of survey centre (3-4), to the E and SE. The significance of these anomalies is uncertain. They are poorly defined, at the limits of instrument detection, and a recent landuse, modern ferrous or natural soil/geological explanation should also be considered. No further responses of significance are indicated by the results from survey in M1.

M2

13.30 Remnants of a former boundary traversing M2 NE-SW have been recorded, with multiple weakly magnetic linear trends of similar alignment reflecting past cultivation/landuse throughout this central portion of the Proposed Development. Two probable pit/posthole concentrations (5-6), are highlighted by the results from M2 NW of survey centre. These are magnetically strong, within 4-5m proximity of one another, and semi-curvilinear in arrangement. The possibility that 5-6 together form part of a levelled enclosure or structure should not be ignored. Weakly magnetic interconnecting linear responses 7-9 traversing the eastern/south-eastern portion of M2 NW-SE and NE-SW are expected to represent remains of an early field system. Discrete positive responses 10-12, located W and NE of survey centre in M2, may be of interest, potentially representing pit/linear remains. Interpretation of responses 11-12 is cautious in view of the previous existence of a large circular exercise ring in this location as shown by Google aerial imagery. No further responses of note have been recorded from survey in M2.

M3

13.31 The results from M3 display no responses of archaeological interest in this southern portion of the Proposed Development. Weakly magnetic trends and poorly defined small-scale positives are evident in this location and expected to be of limited significance. A natural soil/geological, recent land-use or modern ferrous origin is expected for these anomalies.

M4

13.32 A possible archaeological interpretation for an irregular shaped response (13) to the SE in M4 should not be excluded. Weak linear trends of expected natural soil/geological origin are also evident E of survey centre in M4. No further responses of interest are indicated by the results from survey in M4.

13.33 No responses of definite archaeological character have been recorded within the site boundary. A generally quiet magnetic background within the +/-1.5nT range is indicated by the results from survey in M1-M4, each survey location displaying an abundance of small-scale modern ferrous debris, with remains of former field boundaries and past cultivation also present, notably in M1 and M3. Responses of potential interest recorded within the Proposed Development include a weakly magnetic curving linear response, potentially part of a levelled enclosure ditch to the W in M1, and several outlying small-positives; a curving arrangement of probable pit/posthole remains to the NW in M2, with weak linear anomalies and trends suggesting part of an early field system to the E-SE; and a strongly magnetic discrete positive to the SE in M4. Interpretation of these responses is tentative in view of more recent land-use within the site boundary.

13.34 Licensed archaeological testing will be undertaken prior to development to determine the archaeological significance of the anomalies identified above and to determine if any further archaeological mitigation is required.

Characteristics of the Proposed Development

13.35 The proposed 110kV Gas Insulated Switchgear (GIS) Substation Compound includes the provision of a two storey GIS Substation building (with a gross floor area of 1,430sqm) (known as the Peamount

Substation), car parking, lighting, associated underground services and roads within a 3.0m high fenced compound, and all associated construction and ancillary works. The Transformers / MV switch room compound includes three transformers plus MV switch room (200sqm), lighting and lightning masts, car parking, associated underground services and roads within a 3.0m high fenced and separate compound, and all associated construction and ancillary works.

13.36 Two proposed underground single circuit 110kV transmission lines will connect the proposed Peamount 110kV GIS Substation to the existing 2 no. single 110kV underground circuits within the Castlebaggot-Kilmahud circuit to the east. The proposed transmission lines cover a distance of approximately 940m within the townlands of Milltown and Clutterland. They will pass outside of the site underneath the R120, the former Nangor Road, Griffeen River and the newly realigned Baldonnel Road.

13.37 The development includes the connections to the proposed Peamount substation as well as to the Castlebaggot-Kilmahud circuit, changes to the attenuation pond and landscaping permitted under SDCC Reg. Ref. SD20A/0058 and all associated construction and ancillary works.

Potential impacts of the Proposed Development

Construction phase

13.38 Whilst there are no recorded archaeological monuments on the Proposed Development site, there are a significant number of recorded archaeological sites in the vicinity of the Proposed Development, and archaeological excavations in the wider area undertaken in the course of recent development works have uncovered archaeological remains. Furthermore, whilst no upstanding archaeological remains were identified on the site during the assessment, a geophysical survey has identified a number of potential archaeological features surviving subsurface. Therefore, should subsurface archaeological features survive, they will be negatively impacted by ground works associated with the Proposed Development.

13.39 Two structures included in the NIAH are located adjacent to the route of the Proposed Development along the R120 (NIAH Nos 11208006 (outbuilding) & 11208016 (public house)). Neither will be directly impacted by the development.

13.40 The route of the Proposed Development crosses under the Griffeen River, a river known to have had milling activity in the past centuries. However, as the crossing of the river will be sub-surface and by means of directional drilling, there will be no direct impact on the riverbed.

Operational phase

13.41 The operational phase of the project will have no impact on archaeological, architectural and cultural heritage.

'Do-nothing' scenario

13.42 The 'do-nothing' scenario will have no impact on archaeological, architectural and cultural heritage.

Remedial or reductive measures

Construction phase

13.43 As noted above, while the Proposed Development does not impact on any known archaeological sites or monuments, geophysical survey indicates that there is a high possibility that previously unrecorded material or finds may be encountered during ground disturbance associated with this development. Thus, a programme of archaeological investigations will be undertaken within the main site area.

13.44 A suitably qualified archaeological consultant will be retained to advise on the logistical and financial requirements of the management of the archaeological mitigation, and on the programming of the required mitigation works.

13.45 A programme of archaeological test excavations will be undertaken under license to the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht, to investigate these anomalies and assess the portions of the remainder of the site that are in greenfield areas.

13.46 A comprehensive report outlining the results of the programme of archaeological test excavations will be prepared and should include a detailed method statement for the archaeological excavation of features identified, agreed in advance with the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht. The report will include a schedule of works detailing timeframes, personnel and logistical requirements.

13.47 Any areas that require archaeological excavation will be cordoned off to facilitate the archaeological team to carry out the excavations. A buffer zone will be agreed with National Monuments Service and no construction works will be undertaken in these areas until archaeological excavations have been completed.

13.48 Provision has been made by the applicant for all costs associated with archaeological testing, any required excavations and report of the results to the standards required by the National Monuments Service of the Department, Culture, Heritage and the Gaeltacht.

13.49 The remedial or reductive measures outlined here are subject to the approval of the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht.

Operational phase

13.50 No remedial or reductive measures are considered necessary during the operational phase of the Proposed Development, as the operational phase will not give rise to any adverse impacts.

Predicted impact of the Proposed Development

Construction phase

13.51 The construction phase of the Proposed Development will not impact directly on any sites included in the Record of Monuments and Places. However, geophysical survey has identified a number of potential archaeological anomalies within the site. The ground disturbance phase of the Proposed Development would impact negatively on any subsurface features associated with these anomalies.

Operational phase

13.52 The operational phase of the Proposed Development is not predicted to have any impact on archaeological, architectural and cultural heritage.

'Worst case' scenario

13.53 Not applicable in the case of archaeological, architectural and cultural heritage.

'Do nothing' scenario

13.54 In a do-nothing scenario, no development will occur on the site and therefore no potential subsurface archaeological features will be impacted.

Monitoring

13.55 No further archaeological monitoring will be required once construction is completed.

Reinstatement

13.56 Not applicable in respect of archaeological, architectural and cultural heritage.

Cumulative Impacts

13.57 The development context is provided in Chapter 2 of this EIA Report.

Construction phase

13.58 Previous developments in the area, have identified previously unrecorded archaeological features. These sub-surface features would not have been known had development not occurred and the excavation of these features, although resulting in their removal, has added to the academic understanding of the history of the area through archaeological research and reporting.

13.59 As archaeological assessment will be completed in advance of all development on the wider site. The cumulative impact of the Proposed Development, Permitted Development and the concurrent application on the site is deemed to be neutral and not significant.

Operational phase

13.60 No cumulative impacts on archaeological, architectural and cultural heritage are expected as a result of the operational phase of the Proposed Development.

14. WASTE MANAGEMENT

14.1 This chapter deals with waste management during the construction and operational phases of the Proposed Development.

14.2 A site-specific outline Construction & Demolition Waste Management Plan (C&D WMP) has been prepared to deal with waste generation during the construction phase of the proposed development and is included as Appendix 14.1 in the appendix document. The C&D WMP has been prepared in accordance with the '*Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects'* document produced by the National Construction and Demolition Waste Council (NCDWC) in conjunction with the Department of the Environment, Heritage and Local Government in July 2006.

Methodology

14.3 The assessment of the impacts of the Proposed Development arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents (as set out in Sections 14.11 – 14.13), along with an extensive document review to assist in identifying current and future requirements for waste management including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports. A summary of the documents reviewed, and the relevant legislation is provided in Appendix 14.1 C&D WMP of the appendix document.

14.4 This Chapter is based on the proposed development, as described in Chapter 2 (Description of the Proposed Development) and considers the following aspects:

- Legislative context;
- Construction phase (including site preparation, excavation and levelling); and
- Operational phase.

14.5 A desktop study was carried out which includes the following tasks:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the construction and operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

14.6 Estimates of construction waste generation during the construction phase of the proposed development have been calculated. The waste types and estimated quantities are based on published data by the EPA in *National Waste Reports*, data recorded from similar previous developments, Irish and US EPA waste generation research, other available research sources.

14.7 Estimates of surplus made ground and soils and stones generated during the construction phase of the Proposed Development have been calculated by the project engineers.

14.8 There will be a very small amount of waste generated during the operation phase.

14.9 Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Sections 14.56 – 14.65.

14.10 A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 7 Land, Soils, Geology and Hydrogeology. Chapter 7 of the EIA Report also discusses the environmental quality of soils which will have to be excavated to facilitate construction of the proposed development.

Legislation and Guidance

14.11 Waste management in Ireland is subject to EU, national and regional waste legislation which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended).

14.12 In addition, the Irish Government issues regular policy documents which outline measures aimed to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document *A Resource Opportunity – Waste Management Policy in Ireland* was published in 2012 and stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention.

14.13 The strategy for the management of waste from the construction phase is carried out in line with the requirements of the *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* published by the Department of Environment, Heritage and Local Government (DoEHLG) in 2006. The guidance document published by FAS and the Construction Industry Federation (CIF) *Construction and Demolition Waste Management: A handbook for Contractors and Site Managers* were also consulted in the preparation of this assessment.

Receiving environment

14.14 In terms of waste management, the receiving environment is largely defined by South Dublin County Council (SDCC) as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021.

14.15 The waste management plan sets the following targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

14.16 The Regional Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of "70% preparing for reuse, recycling and other recovery of construction and demolition waste" (excluding natural soils and stones and hazardous wastes) to be achieved by 2020. The Waste Action Plan for a Circular Economy continues with this target of keeping the reuse, recycling and other recovery of construction and demolition waste at or above 70%.

14.17 National Waste Statistics update published by the EPA in August 2020 identifies that Ireland's current progress against this C&D waste target is at 77% and our progress against 'Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass (includes metal and plastic estimates from household WEEE)' is at 51%. Both of these targets are required to be met by 12 December 2020 in accordance with the requirements of the Waste Framework Directive, however the EPA are yet to confirm that these were met.

14.18 The *South Dublin County Development Plan 2016 – 2022* sets out a number of objectives and actions for the South Dublin area in line with the objectives of the waste management plan.

14.19 Waste objectives and actions with a particular relevance to the proposed development are as follows:

<u>Objectives:</u>

- **IE5 Objective 1:** To support the implementation of the Eastern–Midlands Region Waste Management Plan 2015-2021 by adhering to overarching performance targets, policies and policy actions.
- **IE5 Objective 2:** To support waste prevention through behavioural change activities to de-couple economic growth and resource use.

- **IE5 Objective 3:** To encourage the transition from a waste management economy to a green circular economy to enhance employment and increase the value recovery and recirculation of resources.
- **IE5 Objective 8:** To secure appropriate provision for the sustainable management of waste within developments, including the provision of facilities for the storage, separation and collection of such waste.

Actions:
- Support and facilitate the separation of waste at source into organic and non-organic streams or other waste management systems that divert waste from landfill and maximise the potential for each waste type to be re-used and recycled or composted and divert organic waste from landfill, in accordance with the National Strategy on Biodegradable Waste (2006).
- Implement the objectives of the National Waste Prevention Programme at a local level with businesses, schools, householders, community groups and within the Council's own activities.
- Promote an increase in the amount of waste re-used and recycled consistent with the Regional Waste Management Plan and Waste Hierarchy and facilitate recycling of waste through adequate provision of facilities and good design in new developments.
- Implement the South Dublin Litter Management Plan 2020 - 2022.

14.20 In terms of physical waste infrastructure, three municipal solid waste landfills remain operational in the Eastern Midlands Region (EMR) and are all operated by the private sector. There are a number of other licensed and permitted facilities in operation in the EMR including waste transfer stations, hazardous waste facilities and integrated waste management facilities. There are two existing thermal treatment facilities, one at Duleek, Co. Meath and a second facility at Poolbeg in Dublin.

Characteristics of the Proposed Development

14.21 The proposed development is described in detail in Chapter 2 (Description of the Proposed Development) of this EIA Report. The aspects relevant to this chapter are described in the following sections.

Demolition Phase

14.22 There will be waste materials generated from the demolition of the existing two storey dwelling of Bulmer and associated outbuildings; as well as the already permitted demolition of the existing single storey house of Little Acre and its associated garage and other buildings; as well as the demolition of the single storey stable building on the overall site. The volume of waste generated from demolition will be more difficult to segregate than waste generated from the construction phase, as many of the building materials will be bonded together or integrated i.e. plasterboard on timber ceiling joists, steel embedded in concrete etc.

14.23 Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific C&D WMP included as Appendix 14.1. The C&D WMP provides an estimate of the main waste types likely to be generated during the construction phase of the Proposed and Permitted Development and these are summarised in Table 14.1.

Table 14.1 Estimated off-site reuse, recycling and disposal estimates for demolition waste

Waste Type	Tonnes	Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Glass	77.2	0	0.0	85	65.6	15	11.6
Concrete, Bricks, Tiles, Ceramics	437.3	30	131.2	65	284.2	5	21.9
Plasterboard	34.3	30	10.3	60	20.6	10	3.4
Asphalts	8.6	0	0.0	25	2.1	75	6.4
Metals	128.6	5	6.4	80	102.9	15	19.3
Slate	68.6	0	0.0	85	58.3	15	10.3
Timber	102.9	10	10.3	60	61.7	30	30.9
Total	**857.4**		**158.2**		**595.5**		**103.7**

Construction phase

14.24 The construction of foundations for the 110kV GIS Substation compound and the 2 no. 110kV transmission lines, will require the excavation of made ground, topsoil, subsoil, tarmac, and possibly bedrock (if encountered).

14.25 The optimum depth of excavation of the trenches required to facilitate installation of the ducting will typically have depth of excavation of 1.25m below ground level but may increase at utility crossings. The typical width of each trench is 0.6m; however, this may vary depending on ground conditions and existing services.

14.26 It is estimated that approximately 1,556m^3 of topsoil, subsoils, tarmacadam / hardcore fill will be excavated to facilitate construction of the proposed transmission lines. It is currently envisaged that majority of this excavated material will require removal offsite for reuse, recovery and/or disposal. In addition to the transmission lines, it is estimated that c. 24,700m^3 of topsoil and subsoils will be excavated for the substation, attenuation, and landscaping component of the proposed development. Suitable soils and stones will be reused on-site as backfill in the grassed and landscaped areas, where possible. It is currently envisaged that all of the excavated material will be reused for a landscaping on site, and will require an additional import of c. 22,000m^3 of soil to complete the landscaping aspects. This fill material will be specified by the Operator, and is designed such that the maximum amount of protection is afforded to the electrical infrastructure beneath it.

14.27 The surplus excavated material will be removed off-site either as a waste or, where appropriate, as a by-product. Where the material is to be reused on another site as a by-product (and not as a waste), this will be done in accordance with Article 27 of the *European Communities (Waste Directive) Regulations 2011*. EPA agreement will be obtained before re-using the excess soils as a by-product. However, it is not currently anticipated that any excavated material will be removed offsite for reuse as a by-product.

14.28 If any excavated material requires removal from site and is deemed to be a waste, removal and reuse/recycling/recovery/disposal of the material will be carried out in accordance with the *Waste Management Act 1996* (as amended), the *Waste Management (Collection Permit) Regulations 2007* (as amended) and the *Waste Management (Facility Permit & Registration) Regulations 2007* (as amended). The volume of waste requiring recovery/disposal will dictate whether a Certificate of Registration (COR), permit or licence is required by the receiving facility.

14.29 Geotechnical and environmental site investigations were carried out by Ground Investigation Ireland in October to November 2020 during the preparation of the EIAR for the Information Communication Technology (ICT) facility under SDCC Reg. Ref. SD20A/0324. Eleven (11) no. trial pits were excavated to a maximum depth of c. 1.60 m. Three (3) no. groundwater monitoring wells were installed as part of these investigations. Eight (8) no. representative soil samples were also recovered from a number of the pits for laboratory analysis. The ground investigation report shows there was no evidence of subsurface contamination encountered during the site investigation works. Environmental analysis was carried out on eight soil samples and all were below the inert threshold concentration for waste as per Waste Acceptance Criteria (WAC) specified in the *European Communities (EC) Council Decision 2003/33/EC)* which establishes the criteria for the acceptance of waste at landfills.

14.30 Nonetheless, in order to establish the appropriate reuse, recovery and/or disposal route for the surplus soils and stones to be removed off-site as a waste, it will first need to be classified. The material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous. Environmental soil analysis will be carried out on a number of representative soil samples for a range of parameters to allow the soil to be accurately classified as hazardous or non-hazardous.

14.31 In addition, soil analysis will also be carried out in accordance with the requirements for acceptance of waste at landfills in accordance with *Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC*, commonly known as Waste Acceptance Criteria. This legislation sets limit values for acceptance of waste at landfills based on properties of the waste including potential pollutant concentrations and leachability. (Note: Clean inert soils and stones excavated from greenfield sections

of the route would generally not require classification/testing but would require a letter of suitability to be provided to the receiving facility.)

14.32 The surplus soils and stones may be suitable for acceptance at either inert or non-hazardous soil recovery facilities/landfills in Ireland or, in the event of hazardous material being encountered, be transported for treatment/recovery or exported abroad for disposal in suitable facilities.

14.33 It is expected that wastes generated (other than excavated material) from other construction activities will be negligible and will generally comprise waste generated from construction workers. These wastes would generally be organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided at the site compound during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices. The welfare facilities and site office for the Proposed Development will be located within the site compound.

14.34 Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific C&D WMP included as Appendix 14.1. Volumes of surplus excavated material are based on estimates by the project engineers.

14.35 It should be noted that until final materials and detailed construction methodologies have been confirmed it is difficult to predict with a high level of accuracy the construction waste that will be generated from the construction of the proposed development as the exact materials and quantities may be subject to some degree of change and variation during the construction process. However, the above estimates are considered to be the worst-case scenario.

14.36 An outline Construction Environmental Management Plan (CEMP) has been prepared to accompany the planning application by JB Barry Consulting Engineers. The appointed main contractor will be required to prepare a detailed CEMP prior to commencement of construction which may refine the above waste estimates.

Operational phase

14.37 Once operational, it is anticipated that very small amount of waste will be generated at the proposed GIS substation from ESB networks staff during their inspections and maintenance works.

14.38 These wastes may include organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons) and non-recyclable waste. Waste fuels/oils, waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently.

Potential impacts of the Proposed Development

14.39 This section details the potential waste impacts associated with the proposed development.

Construction phase

14.40 As detailed in Section 14.24-14.36, the Proposed Development will generate surplus excavated material, as well as waste from the welfare facilities and site office at the site compound located within the site boundary.

14.41 Surplus excavated material classified as waste (as opposed to a by-product) will be segregated at source and transferred directly from site by a suitably permitted waste contractor(s) to suitably authorised receiving facilities.

14.42 Waste materials generated at the site compound from the welfare facilities and site office will be temporarily stored in dedicated receptacles at the site compound pending collection by a suitably permitted waste contractor(s). The waste storage area will need to be easily accessible to waste collection vehicles.

14.43 If waste material is not managed and stored correctly on the site or at the site compound, it is likely to lead to litter or pollution issues at site, site compound and/or on adjacent properties. The knock-on effect of litter issues is the presence of vermin on the site, site compound and the surrounding areas. Waste material will be appropriately managed on site so as to avoid these issues. When this is not undertaken the effect on the local and regional environment is likely to be ***short-term, significant*** and ***negative***.

14.44 The use of non-permitted waste contractors for transportation or unauthorised receiving facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. Removal and reuse/recycling/recovery/disposal of waste material from site will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices.

14.45 Wastes will be collected by a suitably permitted contractor(s) and be transferred to suitably registered/permitted/licenced waste facilities for processing and segregation, reuse, recycling, recovery and/or disposal. There are numerous authorised waste facilities in the Leinster region which can accept non-hazardous and hazardous waste materials and acceptance of waste from the Proposed Development would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the predicted construction waste materials at facilities in the region. When this is not undertaken the effect on the local and regional environment is likely to be ***short-term, significant*** and ***negative***.

14.46 Where offsite reuse of the wastes generated is not feasible, recycling and/or recovery of the waste will be carried out where possible. Recovery and recycling of construction waste has a positive impact on sustainable resource consumption, for example, where waste trees/shrubbery is mulched into a landscaping product or waste asphalt is recycled for use in new pavements. The use of recycled materials, where suitable, reduces the consumption of natural resources. When this is not undertaken the effect on the local and regional environment is likely to be ***short-term, significant*** and ***negative***.

14.47 There is a quantity of material which will need to be excavated to facilitate the Proposed Development. Clean inert soils and stones excavated will be reused on site as backfill, where practical. In the event that potentially contaminated material is encountered, correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on the health and safety of workers as well as on the receiving environment, both on and off-site. Contaminated material will need to be removed off-site for appropriate treatment and/or disposal.

14.48 The reuse of suitable clean inert excavated material onsite, where practical, will reduce consumption of natural quarry resources.

14.49 The potential effect of construction waste generated from the Proposed Development is considered to be ***short-term*** and ***not significant***.

Operational phase

14.50 No waste will be generated from the operation of the proposed 110kV transmission lines.

14.51 Small volumes of waste will be generated at the proposed GIS substation. The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill. However, in the absence of mitigation, significant effects are not likely. The effect is likely to be ***long term, non-significant*** and ***negative***.

14.52 The nature of the development means the generation of waste materials during the operational phase is an unavoidable impact. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for

segregation of municipal recyclables which is typically exported for conversion in recycled products (e.g. paper mills and glass recycling).

14.53 The waste materials generated will require site storage within the substation prior to collection by an authorised waste contractor. Waste collection vehicles will be required to service the development on a regular basis to remove waste.

14.54 If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development and on adjacent developments. The knock-on effect of litter issues is the presence of vermin within the development and the surrounding areas.

14.55 The use of non-permitted waste contractors or unlicensed facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices.

14.56 The potential impact of operational waste generation from the development is considered to be ***long-term, negative*** and ***not significant***.

Do-Nothing Scenario

14.57 If the Proposed Development was not to proceed there would be no additional construction or operational waste generation.

Remedial and Mitigation Measures

14.58 This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

Construction phase

14.59 A project specific outline C&D WMP has been prepared in line with the requirements of the *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* guidance document issued by the Department of Environment, Heritage and Local Government (DoEHLG). Adherence to the high-level strategy presented in the C&D WMP enclosed in Appendix 14.1 will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the construction phase of the proposed development. Prior to commencement of construction, the contractor(s) will be required to refine/update this document to detail specific measures to minimise waste generation and resource consumption and provide details of the proposed waste contractors and destinations of each waste stream.

14.60 It is estimated that approximately 1,556m^3 of topsoil, subsoils, tarmacadam / hardcore fill will be excavated to facilitate construction of the proposed transmission lines component of the proposed development. It is currently envisaged that the majority of this excavated material will require removal offsite for reuse, recovery and/or disposal. In addition to the transmission lines, it is estimated that c. 24,700m^3 of topsoil and subsoils will be excavated for the substation, attenuation, and landscaping component of the proposed development. Suitable soils and stones will be reused on-site as backfill in the grassed and landscape / berming areas, where possible within the wider site. It is currently envisaged that all of the excavated material will be reused for landscaping on site, and will require an additional import of c. 22,000m^3 of soil to complete the landscaping aspects.

14.61 In addition, the following mitigation measures will be implemented:

- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that the following waste types, at a minimum, will be segregated;
  - Made ground
  - Soils and stones

  - Trees/shrubbery
  - In addition, the following wastes will be segregated at the site compound:
    - Organic (food) waste
    - Packaging (paper/card/plastic)
    - Mixed dry recyclables
    - Mixed non-recyclable waste
- All excavations will be carefully monitored by a suitably qualified person to ensure that potentially contaminated soil is identified and segregated, if encountered. In the event that any potentially contaminated material is encountered, it will be segregated from clean/inert material, tested and classified as either non-hazardous or hazardous and further classified as clean, inert, non-hazardous or hazardous in accordance with the EC Council Decision 2003/33/EC, which establishes the criteria for the acceptance of waste at landfills;
- Waste materials generated at the site compound will be stored in suitable receptacles in designated areas of the site compound;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A waste manager will be appointed by the main contractor to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

14.62 As surplus soils and stones will require removal from site, any nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, which requires removal off-site. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Article 27 of the *EC (Waste Directive) Regulations (2011)* as detailed in the C&D WMP (Appendix 14.1).

14.63 These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997 to 2009* and the *EMR Waste Management Plan (2015 - 2021)*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources.

Operational phase

14.64 Small volumes of waste will be generated at the proposed GIS substation. No waste will be generated from the operation of the proposed 110kV transmission lines.

14.65 Any waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the substation.

14.66 In addition, the following mitigation measures will be implemented:

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
  - Dry Mixed Recyclables;
  - Organic food/green waste;
  - Mixed Non-Recyclable Waste;
  - Batteries (non-hazardous and hazardous);
  - Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment; and
  - Cleaning chemicals (solvents, pesticides, paints, adhesives, resins, detergents, etc.).
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly labelled with the approved waste type to ensure there is no cross contamination of waste materials;

- All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

14.67 These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997* and the *EMR Waste Management Plan (2015 - 2021)*. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

Predicted Impacts of the Proposed Development

14.68 This section describes the predicted impact of the proposed development following the implementation of the remedial and mitigation measures.

Construction phase

14.69 A carefully planned approach to waste management as set out in Sections 14.59 – 14.63 and adherence to the outline C&D WMP during the construction and demolition phase will ensure that the impact on the environment will be ***short-term, neutral*** and ***imperceptible***.

Operational phase

14.70 During the operational phase, a structured approach to waste management as set out in Sections 14.64 – 14.67 will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted impact of the operational phase on the environment will be ***long-term, neutral*** and ***imperceptible***.

Residual Impacts

14.71 Adherence to the mitigation measures outlined in Sections 14.59 - 14.67 will ensure that there are no significant impacts on resource or waste management from the Proposed Development. The management of waste during the construction phase in accordance with the Construction & Demolition Waste Management Plan (C&D WMP) and during the operational phase in accordance with the mitigation measures will meet the requirements of regional and national waste legislation and promote the management of waste in line with the priorities of the waste hierarchy. The residual impact will be ***neutral*** and ***imperceptible***.

Cumulative Impacts

14.72 The anticipated cumulative effect of the Proposed Development with any/all relevant other planned developments as outlined in Chapter 2 (Permitted and concurrent application on the wider site) are discussed for construction and operational phases respectively below.

14.73 The construction of the Proposed Development and other surrounding proposed and permitted developments require site clearance, excavations and levelling which will generate a requirement for soil removal and/or import. The cumulative developments will require a net import of soil which is readily available. Provided mitigation measures set out in the planning permissions / EIA Reports for these developments are implemented during construction of the Proposed Development, the cumulative impact will be ***short-term*** and ***imperceptible.***

14.74 The waste quantities to be generated from the operation of the proposed developments within the overall landholding are anticipated to be relatively small.

14.75 The proposed development and other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such it is considered that the cumulative impact relating to waste management will be ***long-term*** and ***imperceptible.***

15. MATERIAL ASSETS

Introduction

15.1 This chapter evaluates the impacts, if any, which the Proposed Development may have on Material Assets as defined in Directive 2014/52/EU, the EPA Draft EIA Report Guidelines 2017 and EPA Draft Advice Notes for EIS 2015.

Methodology

15.2 The chapter includes a description of the forecasting methods or evidence used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.

15.3 The EPA Draft EIA Report Guidelines 2017 state that material assets are now taken to mean built services and infrastructure, roads and traffic as well as waste management. In this EIA Report, the impacts on some of the material assets described above have been considered in the following chapters:

- Chapter 5, Population and Human Health;
- Chapter 10, Air Quality & Climate;
- Chapter 12, Traffic & Transportation; and
- Chapter 14, Waste Management.

15.4 The European Commission Guidance on Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017) refers to a number of examples of material assets including buildings, other structures, mineral resources and water resources. The impacts on mineral resources and water resources have been considered in the following chapters of this EIA Report:

- Chapter 7, Land, Soils, Geology & Hydrogeology; and
- Chapter 8, Hydrology.

15.5 This chapter assesses ownership and access (including buildings and other structures), built services and infrastructure. The potential impacts on built services and infrastructure, if any, are assessed in terms of the following:

- Power and Electricity supply;
- Telecommunications;
- Surface water infrastructure;
- Foul drainage infrastructure; and
- Water supply.

15.6 The Proposed Development will not impact on any other structures. Assessment of impact on utilities has been undertaken by confirmation of supply with the various key utility suppliers of South Dublin County Council (SDCC), Eirgrid, ESB Networks, and Irish Water (IW). Mitigation measures are proposed where required

Ownership and access

15.7 The EPA Draft Advice Notes 2015 refer to the need to consider the ownership and accessibility of the site. This section addresses ownership and accessibility of the site for the Proposed Development.

15.8 The site of the Proposed Development as described in Chapter 2 Description of the Proposed Development is under the following ownership:

- GIS substation and Transformer / MV Building Compounds and the first c. 310m of the two transmission lines are within private ownership; and
- The rest of the 110kV transmission lines to the Castlebaggiot-Kilmahud circuit continues for c. 630m along and under the R120, former R134 (Nangor Road) and through SDCC lands outside

the main development site. Where the route is not in the ownership of SDCC they are in control of the land as it has been taken in charge.

15.9 Letters of consent, to apply for development on the lands have been obtained from the owners of the main site and SDCC and are included with the Proposed Development planning application documents.

15.10 As detailed in Chapter 2, the GIS substation and Transformer / MV Building compound is located within the overall Permitted Development site (SDCC Reg. Ref. SD20A/0058) and the concurrent application for an ICT Facility (SDCC Reg. Ref. SD20A/0324). It is intended that the commencement of construction of the Permitted Development as part of the first phase of the development of this site, will commence in Q4 2021.

15.11 The main access to the GIS substation compound will be via the permitted entrance to the main site from the Peamount Road to the south. This access road was permitted under SDCC Reg. Ref. SD20A/0058 and will also serve the PGF, and subject to a grant of permission will include a spur inside the entrance to provide access to the proposed ICT Facility. The Permitted Development site will be fully secured with a 3m high security fence, CCTV and surveillance systems with a further 3m high fence around the proposed 110kV GIS substation compound and transformer / MV building compound. There is good visibility on approach to the permitted access point as detailed in Chapter 12 - Traffic and Transportation.

Receiving environment

15.12 The proposed drainage infrastructure has been described in Chapter 2 (Description of the Proposed Development) and Chapter 8 (Hydrology). Detailed water supply and drainage design information is provided in the stand alone Water Services Report, prepared by JB Barry, Consulting Engineers, which accompanies the planning application. The associated built services and infrastructure in the vicinity of the site are summarised in the following sections.

Power and electrical supply

15.13 The connection to the National Grid is a key consideration for the Permitted Development of the Power Generation Facility. One of the key reasons the site was chosen for the Permitted Development was the relative proximity to existing grid infrastructure and the established constraints within the National Grid in the wider Dublin Area. The Proposed Development will facilitate this connection to the National Grid via the Castlebaggot – Kilmahud Circuit.

15.14 The availability of power is also a key consideration for the concurrent application for the ICT facility on the main site. The ability to provide power through the National Grid, subject to agreement from Eirgrid, via the proposed substation was a key consideration in site selection for the proposed ICT facility.

Telecommunications

15.15 A fibre optic cable distribution network will be installed within the site for the Proposed and Permitted Development. The connection into the wider telecommunications network will be undertaken by a statutory telecommunications operator. The requirement for telecoms is minor for this Proposed Development and there is sufficient capacity in the wider network.

Surface water infrastructure

15.16 It is proposed to connect to the existing 450mm public surface water network to the east of the site along Baldonnel Road, approximately 550m away. This will necessitate laying a 300mm diameter outfall pipe underneath the public roads, the R120 and former R134. The JB Barry Consulting Engineers, Flood Risk Assessment and the Water Services Report review the existing and proposed surface water environment and accompanies the planning application for the Proposed Development.

15.17 The surface water drainage infrastructure for the Permitted Development has been increased to accommodate surface water drainage for the entire site under the concurrent application. No changes to this attenuation are proposed to that applied for under the concurrent application.

Foul drainage infrastructure

15.18 The Proposed Development will discharge via a 225mm sewer to the existing 375mm public sewer to the east of the site, approximately 550m away, as shown on drawing no. 19229-JBB-00-XX-DR-C-01500.

15.19 All foul effluent generated is directed via gravity into the Grange Castle Business Park Waste Water Treatment Plant that will ultimately drain to the regional Wastewater Treatment Plant at Ringsend in Dublin for ultimate disposal. All foul drainage infrastructure outside of Grange Castle Business Park is under the administrative control of Irish Water. It is noted that separate foul and storm water drainage systems service the Proposed Development site.

15.20 A pre-connection enquiry (PCE) form was submitted to Irish Water (IW) as part of the Permitted Development application (Reg. Ref. SD20A/0058) that took accoubnt of the current Proposed Development. IW provided a confirmation of feasibility (CoF) for the development on the 14th April 2020 (IW Reference Number: Reference No CDS20001484). A pre-connection enquiry (PCE) form was submitted to Irish Water in November 2020 which addressed wastewater discharges (and water demand) for the concurrent application on the wider site.

15.21 As detailed in the *Water Services Report*, prepared by JB Barry, Consulting Engineers, the estimated average daily foul water demand for the Proposed Development has been determined by CSEA to be up to 500l/day which represents a negligible volume in terms of the volume permitted by IW for the entire landholding.

15.22 Welfare facilities (canteen, toilets etc.) will be available within the construction compound for the construction of the Permitted Development and it is proposed that can be utilised for the c. 15 – 30 staff required for the construction phase of the Proposed Development.

15.23 The allowance is based on a single toilet and tea -station. The demand from the Proposed Development on wastewater infrastructure will not affect the ability of any existing or future developments in the area to access wastewater discharge.

Water supply

15.24 The water demand for the Proposed Development will be minimal. The Proposed Development will connect to a water main permitted under Reg. Ref. SD20A/0058. The permitted 200mm internal water main connection will connect into the 700mm diameter Irish Water supply to the south of the overall site.

15.25 The proposed Watermain Layout is indicated on Drawing no. 19229-JBB-00-XX-C-01502, prepared by JB Barry, Consulting Engineers and included in the planning documentation pack as part of the Proposed Development planning application documentation. The Proposed Development will be served by fire hydrants connected to the permitted water main network.

15.26 A pre-connection enquiry (PCE) form was submitted to Irish Water (IW) as part of the Permitted Development application (Reg. Ref. SD20A/0058) that took into consideration the requirements of the Proposed Development. IW provided a confirmation of feasibility (CoF) for the development on the 14th April 2020.

15.27 The allowance for the Proposed Development is minimal and is based on a single toilet and tea -station. The demand from the Proposed Development on water supply will not affect the ability of any existing or future developments in the area to access water through this water supply.

Characteristics of the Proposed Development

Construction phase

Power and Electrical Supply

15.28 During construction, contractors will require power for heating and lighting of the site and their onsite construction compound. In addition, on site construction equipment/plant will require power. The

construction compound and temporary power supply established for the construction of the Permitted Development will be utilised for the Proposed Development. The power requirements for the construction phase will be relatively minor.

15.29 The excavation of trenches within the vicinity of existing electrical services will be carried out in consultation with ESB Networks to ensure that there is no impact on existing users. Once the construction of the Proposed Development is completed, ESB Networks personnel will be mobilised to complete the commissioning.

Telecommunications

15.30 Telecommunications including fibre required during the construction phase will be provided via a temporary mobile connection. The fibre optic cable distribution network for the permitted development will be extended to the GIS substation. The proposed 110kV transmission lines will not require the provision of telecommunications services. The extension of the network within the overall landholding will have a temporary imperceptible effect on the environment.

Surface water and foul drainage infrastructure and water supply

15.31 The route of the 110kV transmission line to the Castlebaggot-Kilmahud circuit traverses an existing culverted part of the Griffeen River. It is proposed to cross under this culvert via horizontal directional drilling (HDD). The use of HDD methodology removes the potential for hydrological pathways and as such impacts on the Griffeen River. The implementation of construction mitigation measures detailed in Chapter 2 will ensure that there is no predicted impact on the Griffeen River.

15.32 If any stormwater collects in the trenches during construction, it will need to be discharged to the sewer network. Any discharge water will be treated using a siltbuster or similar to remove suspended solids prior to discharge.

15.33 Welfare facilities (canteens, toilets etc.) will be available within the construction compound for the construction of the Permitted Development and it is proposed that they can be utilised for the small number of staff required for the construction phase of the Proposed Development. The increase in water demand and wastewater discharges, if any, will be imperceptible and will not affect existing users.

Operational phase

Power and electrical supply

15.34 The Proposed Development will facilitate the export of power from the PGF to the National Grid. The Proposed Development also has capacity to supply the permanent power supply to the adjacent ICT Facility application that is currently subject to an Additional Information request from SDCC.

Telecommunications

15.35 There is sufficient capacity available in the network to accommodate the Proposed Development.

Surface Water and Foul Drainage Infrastructure and Water Supply

15.36 Rainwater runoff from the proposed 110kV GIS substation compound will discharge to the surface water drainage network for the Permitted Development (Reg. Ref. SD20A/0058) that is proposed to be expanded in terms of the attenuation pond under the Proposed Development. The surface water drainage network for the Permitted and Proposed Development is designed to accommodate surface water drainage from the wider site.

15.37 Full details of the surface water infrastructure of the Proposed Development are provided within the Water Services Report, prepared by JB Barry Consulting Engineers that accompanies the application for the Proposed Development. The drainage design includes oil separator interceptor systems to ensure the quality of storm water discharge is controlled prior to attenuation and discharge offsite.

15.38 The attenuated storm water will be discharged at the SDCC allowable greenfield run off rate of 56.3l/sec via a hydrobrake control device to the existing storm water system some 550m to the east of the main site (see Chapter 2 – Description of the Proposed Development and Chapter 8 – Hydrology for further details). The attenuation design allows for the full development of the site under the Permitted Development, Proposed Development and the concurrent application in its calculations.

15.39 Chapter 8 Hydrology addresses the impacts of the Proposed Development on storm water drainage. The underground single circuit 110kV transmission lines from the proposed substation to the existing Castlebaggot – Kilmahud circuit do not require any surface water drainage infrastructure.

15.40 Once operational, a small number of ESB Networks staff will undertake operational activities from the substation with only interim inspections required along the underground 110kV transmission lines. Two ESB maintenance staff will carry out a routine inspection of the 110kV cable installations one year after completion and once every three years thereafter.

15.41 Domestic effluent arising from the welfare facilities for staff at the GIS substation building will be collected in the permitted foul drainage network within the site and discharged to the local private foul drainage network within Grange Castle Business Park. The wastewater discharged from the site will ultimately discharge to the municipal Waste Water Treatment Plant (WWTP) at Ringsend. The wastewater contribution from the Proposed Development will be minimal. Chapter 6 Hydrology addresses the impacts on foul water drainage.

15.42 The underground single circuit 110kV transmission lines from the proposed substation to the existing Castlebaggot - Kilmahud will not generate any wastewater and as such do not require any foul drainage infrastructure.

15.43 Water will be required for the welfare facilities for staff at the GIS substation. This will be provided via a connection to the watermain for the permitted development. The water demand for the Proposed Development will be minimal. Chapter 8 Hydrology addresses the impacts on water supply.

15.44 By nature of the developments, the underground single circuit 110kV transmission lines from the proposed substation to the existing Castlebaggot - Kilmahud C circuit does not require any water supply.

Potential impacts of the Proposed Development

Construction phase

Power and electrical supply

15.45 The construction compound and temporary power supply that will be established for the construction of the Permitted Development will be utilised for the Proposed Development. The power requirements for the construction phase will be relatively minor and therefore the power demand for the construction phase would have a potential ***short-term, neutral, imperceptible*** impact.

15.46 The excavation of trenches within the vicinity of existing electrical services will be carried out in consultation with ESB Networks to ensure there is no impact on existing users.

Telecommunications

15.47 Telecommunications including fibre required during the construction phase will be provided via a mobile connection. A fibre optic cable distribution network will be installed within the site, for the entire Permitted and Proposed Development. There are no potential impacts associated with telecommunications for the Proposed Development for the construction phase.

Surface water infrastructure

15.48 As discussed earlier in this chapter, the surface water drainage network is designed to accommodate surface water drainage from the full development of the site. There is a need to increase the capacity of the attenuation pond in order to accommodate surface water runoff from the Proposed Development

as well as the permitted and concurrent applications and no potential impacts on the surface water infrastructure.

15.49 The route of the 110kV transmission line to the Castlebaggot - Kilmahud circuit traverses under an existing culverted part of the Griffeen River. The transmission line will pass beneath the culvert by way of horizontal directional drilling (HDD). Chapter 8 Hydrology addresses the impacts on the River associated with this transmission line. There are no predicted impacts on the Griffeen River. There are no potential impacts associated with surface water infrastructure for the Proposed Development for the construction phase.

15.50 The potential impact associated with surface water for the construction phase is ***short-term, neutral and imperceptible***.

Foul drainage infrastructure

15.51 Welfare facilities (canteens, toilets etc.) will be available within the construction compound for the permitted development on the site approved under Reg. Ref. SD20A/0058 and it is proposed that it can be utilised for the small number of staff required for the construction phase of the Proposed Development. The increase in wastewater discharges, if any, will be imperceptible and will not affect existing users. There may be a requirement to discharge stormwater collected in the trenches for the 110kV transmission lines to sewer. Any discharge water will be treated using a siltbuster or similar to remove suspended solids to ensure there is no impact on the foul drainage network. There will be no impact from construction works on the existing foul sewer network during construction.

15.52 It not anticipated that the connection to this sewer would have any offsite impact. The potential impact associated with foul drainage for the construction phase is ***short-term, neutral and imperceptible***.

Water supply

15.53 Welfare facilities (canteens, toilets etc.) will be available within the construction compound for the permitted development on the site approved under Reg. Ref. SD20A/0058 and it is proposed that it can be utilised for the small number of staff required for the construction phase of the Proposed Development. The increase in water demand, if any, will not be significant enough to impact existing users.

15.54 The potential impact associated with water supply for the construction phase is ***short-term, neutral and imperceptible.***

Operational phase

Power and electrical supply

15.55 The proposed 110kV GIS substation and110kV transmission lines are designed to facilitate the export of power from the permitted PGF within the overall landholding. The proposed 110kV GIS substation and110kV transmission lines will also support power demand for the proposed ICT Facility on the overall site, if permission is granted. In this instance the nature of the Proposed Development ensures that the Permitted Development will enhance the National Grid in an area where demand is constrained. The Proposed Development will also ensure a continuity of supply of electricity to the proposed ICT Facility under the concurrent application on the wider site..

15.56 There are **no potential impacts** associated with power and electrical supply for the Proposed Development for the operational phase.

Telecommunications

15.57 There are ***no potential impacts*** associated with telecommunications for the Proposed Development for the operational phase as outlined in Chapter 2.

Surface water

15.58 It is proposed to collect the surface water runoff from the Proposed Development and discharge an attenuated flow via an enlarged attenuation pond from that permitted under Reg. Ref. SD20A/0058 to the existing surface water drainage network some 550m to the east. The surface water drainage network for the Permitted Development is required to be increased due to the full design out of the concurrent application for an ICT facility on the wider site.

15.59 The underground single circuit 110kV transmission lines from the proposed substation to the existing Castlebaggot -Kilmahud circuit does not require any surface water drainage infrastructure. The cable installations are underground and the joint bays will be constructed on a primarily permeable gravel surface.

15.60 There are no potential impacts associated with surface water infrastructure for the Proposed Development for the operational phase.

Foul drainage infrastructure

15.61 Domestic effluent arising from the welfare facilities at the GIS substation will be minimal and will be collected within the permitted foul drainage network within the site and discharged to the local foul drainage network. The underground single circuit 110kV transmission lines from the proposed substation to the existing Castlebaggot - Kilmahud circuit does not require any foul drainage infrastructure. There are ***no potential impacts*** associated with foul drainage infrastructure for the Proposed Development for the operational phase.

Water Supply

15.62 A pre-connection enquiry (PCE) form was submitted to Irish Water (IW) as part of the Permitted Development application (Reg. Ref. SD20A/0058) that took into consideration the water supply requirements of the Proposed Development. IW provided a confirmation of feasibility (CoF) for the development on the 14th April 2020. A subsequent PCE was submitted to IW in November 2020 in relation to the concurrent application for the ICT facility on the wider site.

15.63 The underground single circuit 110kV transmission lines from the proposed substation to the existing Castlebaggot – Kilmahud circuit does not require any water supply. There are ***no potential impacts*** associated with water supply for the Proposed Development for the operational phase.

Remedial and mitigation measures

Construction phase

15.64 Construction of the proposed GIS substation will require connections to power, telecommunications, drainage infrastructure and water supply but will not require any connections outside the Permitted Development site and Proposed Development site boundaries.

15.65 Construction of the 110kV transmission lines will not require any power, telecommunications, drainage infrastructure and water supply from existing services.

15.66 Completed surveys have identified where short term diversion of any services will be required. Ongoing consultation with EirGrid, ESB Networks, SDCC, Irish Water and other relevant utility providers within the locality and compliance with any requirements or guidelines they may have will ensure a smooth construction schedule without disruption to the local and business community. Such diversions are common practice.

Power and Electricity Supply

15.67 The power demand for the construction phase will be relatively minor and the temporary connection works are entirely within the wider site, and there will therefore be no offsite impact. The excavation of trenches within the vicinity of existing electrical services will be carried out in consultation with ESB Networks to ensure there is no impact on existing users. Once the construction of the Proposed Development is completed, ESB Networks will be mobilised to complete the commissioning in

accordance with the ESB Network requirements. As stated in Chapter 2, there is no requirement for chemicals usage and minimal access to the route by personnel and there is no likely environmental effect as a result of commissioning.

Telecommmunications

15.68 The telecommunications will be extended from the Permitted Development granted under Reg. Ref. SD20A/0058 to accommodate the Proposed Development. As these works are entirely within permitted and proposed site boundaries, it is predicted that there will be no offsite impact as result of these works.

15.69 No remedial or mitigation measures are required in relation to telecommunications.

Surface Water and Foul Drainage Infrastructure and Water Supply

15.70 Welfare facilities (canteens, toilets etc.) will be available within the construction compound of the Permitted Development and it is proposed that this will be in place for the construction of the Proposed Development.

15.71 No remedial or mitigation measures are required in relation to foul drainage infrastructure and water supply.

15.72 Surface water run-off water containing silt will be contained on site and treated (using a siltbuster or temporary on-site settlement ponds/tanks) to ensure adequate silt removal. The construction works will not require any interruptions to service in existing surface water sewers.

Operational phase

Power and electricity supply

15.73 The Proposed Development has been designed in accordance with ESB Networks requirements. Eirgrid has confirmed that there is sufficient capacity to export power under licence into the National Grid via the Castlebaggot-Kilmahud Circuit.

15.74 The nature of the Proposed Development ensures that it will facilitate the export of power, and has the capacity to facilitate the continuity of supply of electricity to the concurrent application for the ICT Facility.

15.75 No remedial or mitigation measures are required in relation to power and electricity supply.

Telecommunications

15.76 As there are no potential effects on telecommunications during the operational phase of the Proposed Development, no remedial or mitigation measures are required.

Surface Water and Foul Drainage Infrastructure and Water Supply

15.77 There are no potential effects associated with surface water and foul drainage infrastructure or water supply for the Proposed Development for the operational phase and as such no remedial or mitigation measures are deemed necessary.

Predicted impacts of the Proposed Development

Construction phase

15.78 The implementation of mitigation measures detailed in paragraphs will ensure that the predicted impacts on the material assets assessed in this chapter will be ***short-term, neutral*** and ***imperceptible*** for the construction phase.

Operational phase

Power and electrical supply and Telecommuncations

15.79 The Proposed Development has been designed in accordance with the requirements of ESB Networks. Eirgrid has confirmed that there is capacity to export power under licence into the National Grid via the Castlebaggot – Kilmahud Circuit. The Proposed Development has also been designed to provide power for the concurrent application for an ICT Facility subsequent to a grant of permission and the provision of an import licence and connection point from Eirgrid. There are no predicted impacts associated with power and electrical supply, and telecommunications for the Proposed Development for the operational phase.

Surface Water and Foul Drainage Infrastructure and Water Supply

15.80 The surface water and foul drainage and water supply requirements for the Proposed Development have already been incorporated into the design of the surface water and foul drainage and water supply infrastructure for the Permitted Development (Reg. Ref. SD20A/0058) albeit slightly increased under the Proposed Development. There are no predicted impact on water supply, surface water infrastructure and foul drainage infrastructure post construction.

Predicted impact – operational phase

15.81 The predicted impacts on power and electrical supply, telecommunications, surface water infrastructure, foul drainage infrastructure and water supply will be ***long-term, neutral*** and ***imperceptible.***

Residual impacts

15.82 The Proposed Development entails minimal use of material assets examined in this chapter (i.e. power and electrical supply, telecommunications, surface water infrastructure, foul drainage infrastructure and water supply) during construction with no impact once operational. The overall predicted residual impact of the Proposed Development can be classed as ***long-term*** and ***not significant*** with respect to material assets.

15.83 Interactions are addressed in Chapter 16 of this EIA Report.

Cumulative impacts

15.84 The Proposed Development entails minimal use of material assets during construction. Once operational, the Proposed Development will result in minimal impact on surface water, foul drainage and water infrastructure. The Proposed Development will connect to the surface water and foul drainage within the Business Park and water supply infrastructure immediately adjacent to the site.

15.85 The Applicant has previously engaged with IW to ensure that there is sufficient capacity to cater for the water supply and wastewater for the Proposed Development and the Permitted Development. As noted in this chapter and the Water Services Report a PCE form was submitted to IW which addressed water and wastewater demand for these developments Irish Water (IW) provided a confirmation of feasibility (CoF) for the overall development. A separate PCE application has been made for the application for the ICT facility on the wider site.

15.86 The Proposed Development will have a negligible demand on power. Based on this, it is predicted that the cumulative impact of the Proposed Development with other permitted and planned developments is considered to be imperceptible during the construction and operational phases. The Proposed Development entails minimal use of material assets (i.e. power and electrical supply, telecommunications, surface water infrastructure, foul drainage infrastructure and water supply) during construction with no impact once operational. The overall predicted cumulative impact of the Proposed Development with other permitted developments can be classed as ***long-term*** and ***not significant*** with respect to material assets during the construction and operational phases.

16. INTERACTIONS

Introduction

16.1 This chapter of the EIA Report addresses potential interactions and inter-relationships between the environmental factors discussed in the preceding chapters. This covers both the construction and operational phase of the Proposed Development.

16.2 As a requirement of the EIA Directive, the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, the EPA Draft EIA Report Guidelines 2017 and EPA Draft Advice Notes for EIS 2015, not only are the individual significant impacts required to be considered when assessing the impact of a development on the environment, but so must the interrelationships between these factors be identified and assessed.

16.3 In the main, the majority of EIA Report chapters have already included and described assessments of potential interactions between aspects, however this section of the assessment presents a summary and assessment of the identified interactions. These interactions have been identified and considered by the various specialists contributing to this impact assessment.

Discussion – Positive Impacts

16.4 The reasoning behind the interactions that are considered to have a positive effect (i.e. a change which improves the quality of the environment) is outlined in this section.

Planning and Alternatives on:

Population and Human Health

16.5 The Proposed Development will be designed to facilitate the export of power from the Permitted Development into the National Grid via the Castlebaggot – Kilmahud Circuit. It is also designed to provide a permanent power supply for the concurrent application for an ICT Facility on the site, subject to a grant of permission and import licence and point of connection from Eirgrid.

16.6 The Proposed Development will create between 15-30 temporary jobs during the construction phase, which will have a short term, positive, not significant effect on employment and business in the area.

Discussion – Neutral Impacts

16.7 The reasoning behind the interactions that are considered to have a neutral effect (i.e. no effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error) is outlined in this section.

Land, Soils, Geology and Hydrogeology on:

Population and Human Health

16.8 There will be a loss of soil available for agricultural use due to the development. However, within the overall context of Ireland's available farmland, the loss is considered negligible. However, as the lands are already zoned for development there is no overall loss of agricultural land use. This *change of land use has already been established for the Permitted Development (SDCC Reg. Ref. SD20A/058).* In addition, the employment created by the construction and operation of the Proposed Development counterbalances this economic loss and so the impact is ***long-term, imperceptible*** and ***neutral***.

Hydrology

16.9 The main potential impact of the construction works proposed is on surface water quality (due to sediment laden run-off, material spillages) and groundwater quality (due to removal of protective soil for the construction of the proposed substation). However, the implementation of a CEMP as detailed in Chapter 3 (Description of the Proposed Development) and Chapter 8 (Hydrology), as well as mitigation measures under the Permitted and Proposed Development that included surface water attenuation for the overall site, including the proposed substation site, will ensure the effect on Hydrology will be ***short term, imperceptible*** and ***neutral***.

Biodiversity

16.10 The surrounding area to the east is being extensively developed and the majority of its natural flora and fauna has been removed/displaced. Notwithstanding the loss of soil environment during construction; the mitigation measures in the form of addition vegetation and planting granted under the Permitted Development, and further added to under the Proposed Development, will maintain habitat for flora and fauna and therefore the effect on biodiversity will be ***long-term, moderate*** and ***neutral***. The impact of local loss of arable land of no significant ecological value is negligible.

Air Quality and Climate

16.11 There is a potential for the construction activity to impact on air quality in terms of dust generated but mitigation measures outlined in both Chapter 7 (Land, Soils, Geology & Hydrogeology) and Chapter 10 (Air Quality & Climate) of this EIA Report, implemented through the CEMP, will ensure a ***short term, imperceptible*** and ***neutral*** effect. There are no predicted perceptible impact during operation.

Waste Management

16.12 As detailed in Chapter 14 (Waste Management), c. 26,256m^3 of excavated material may be generated during construction. The majority of the excavated material along the transmission line will need to be removed off-site either as a waste or, where appropriate, as a by-product. The majority of the excavated material within the main site will be primarily used for landscaping purposes within the wider site. The management of waste during the construction phase in accordance with the Construction & Demolition Waste Management Plan (C&D WMP) will meet the requirements of regional and national waste legislation and promote the management of waste in line with the priorities of the waste hierarchy. Therefore, the effect of generation of soils/stones in terms of waste management will be ***neutral***.

Hydrology on:

Population and Human Health

16.13 Once operational, the Proposed Development will generate minimal wastewater emissions (foul water) from the GIS substation welfare facilities. This will discharge via the local sewer network to the private Grange Castle Waste Water Treatment Plant in Grange Castle; and ultimately to the Local Authority wastewater treatment plant (WWTP) at Ringsend. As treated wastewater discharges from the WWTP to Dublin Bay, which is a public amenity, there is a potential for impact on the human beings using this amenity. However, as the Grange Castle and Ringsend WWTP will provide treatment for wastewater emissions, the effect is considered to be ***long-term, imperceptible*** and ***neutral***.

Land, Soils, Geology and Hydrogeology

16.14 Surface water run-off collected in excavations during the construction phase of the Proposed Development will be pumped out and treated prior to discharge (see Chapter 8 Hydrology). The effect will be ***short-term***, ***imperceptible*** and ***neutral***. Surface water run-off from the site once operational will be collected within the enlarged attenuation pond that was originally permitted under the Permitted Development and is proposed to be enlarged under this application. The attenuation pond is adequately sized to accommodate surface water run-off from the wider site. The effect will be ***long-term***, ***imperceptible*** and ***neutral***.

16.15 The 110kV transmission line will cross under the Griffeen Stream culvert by horizontal directional drilling. The implementation of mitigation measures will ensure the impact on the stream is ***imperceptible*** and ***neutral.***

Biodiversity

16.16 Surface water from the Proposed Development substation will drain to the proposed enlarged attenuation pond via hydrocarbon interceptors and outfall into the existing storm water drain some 550m to the east. The attenuation pond is adequately sized to accommodate surface water run-off from the overall site. The effect will be ***long-term***, ***imperceptible*** and ***neutral***.

16.17 There is no formal designation on the Proposed Development lands and the development area may be considered of Low Local Ecological Value. Designated sites that local streams ultimately runs into (River Liffey) are located a 5.5kms distance downstream as outlined in Chapter 6 of the EIA Report. The impact on biodiversity will be ***long-term, imperceptible*** and ***neutral***.

Waste Management

16.18 Hydrocarbon sludge waste and debris will be generated in the hydrocarbon interceptors which will treat the surface water run-off from the Proposed Development during the operational phase. This waste stream will be managed in accordance with the relevant legislation identified in Chapter 14 such that the effect of the waste generation will be ***long-term, imperceptible*** and ***neutral***.

Air Quality and Climate on:

Population and Human Health

16.19 The mitigation measures that will be put in place at the Proposed Development for the construction phase will ensure that the impact of construction dust emissions in the form of nuisance dust are ***short-term*** and ***imperceptible***. Further detail on human health and air quality is presented in Chapter 5.

Biodiversity

16.20 Mitigation measures during the construction phase of the Proposed Development will ensure that dust generation is minimised and the effect on biodiversity will be ***short term***, ***imperceptible*** and ***neutral***. There is no interaction between Air Quality and Climate on Biodiversity during the Operational Phase due to the low level of maintenance traffic that will be generated by all aspects of the Proposed Development.

Hydrology

16.21 Mitigation measures implemented during the construction phase will ensure that the deposition of dust is minimised and therefore the predicted effect from air (including dust) on the water environment during construction is ***short-term, imperceptible*** and ***neutral***. There is no interaction between Air Quality and Climate on Hydrology during the Operational Phase.

Noise and Vibration on:

Population and Human Health

16.22 The potential impact of noise and vibration on the local population is discussed in Chapter 5 (Population and Human Health) and Chapter 9 (Noise & Vibration). Noise emissions associated with the construction phase of the development are expected to be less than the prevailing ambient noise level at the nearest sensitive locations. In addition, due to the distance between the site and the nearest sensitive locations, vibration impacts generated during construction are expected to be ***negligible***. There are no predicted noise impacts beyond the emergency generator that will only operate in emergency circumstances to provide back-up power to the GIS building, and has been scoped out of this assessment. The level of traffic generated by maintenance traffic to the Proposed Development is very low and will be imperceptible and therefore once operational there will not be a significant impact on human health as a result of noise emissions.

Landscape and Visual on:

Population and Human Health

16.23 The predicted impact of the Proposed Development on the landscape is described in Chapter 11. The Proposed Development is well-sited and was fully considered as part of the design and planning of the Permitted Development and wider site. The Permitted Development includes permitted landscape proposals, that are further enhance under the current proposal, that will ensure the Proposed Development is integrated into its setting, including the use of landscaped berms which will provide

visual screening as granted under the Permitted Development. Residual landscape and visual effects from the wider locality will be ***not significant*** or ***imperceptible***, will be ***long-term***.

Biodiversity

16.24 The construction of the Proposed Development will involve the removal of some of the existing landscape. The mitigation measures in the form of additional planting and landscaping features such as berms, granted under the Permitted Development, and only to be minimally altered under the Proposed Development, will maintain habitat for flora and fauna and therefore the effect on biodiversity will be ***long-term, moderate*** and ***neutral***.

Material Assets on:

Population and Human Health

16.25 The Proposed Development will not have a significant impact on material assets such as surface water drainage, water supply, wastewater drainage, power supply and road infrastructure. The individual chapters of this EIA Report (Chapter 12 Traffic and Transportation and Chapter 15 Material Assets) have assessed the capacities of the available infrastructure to accommodate the Proposed Development and the implementation of the mitigation measure proposed in each of these chapters will ensure there are no residual negative impacts on the local population. The predicted effect is therefore ***imperceptible*** and ***neutral***.

Hydrology

16.26 The Proposed Development will result in minor changes to surface water drainage, water supply and wastewater networks. However, a combination of mitigation measures to be implemented as detailed in Section Chapter 8 (Hydrology), as well as the capacity already built into these networks, will ensure that these changes will result in a ***long-term, imperceptible*** and ***neutral*** impact.

Discussion – Negative Impacts

16.27 *The reasoning behind the interactions that are considered to have a negative effect (i.e. a change which reduces the quality of the environment) is outlined in this section.*

Noise on:

Biodiversity

16.28 Noise generated during the construction phase of the Proposed Development will have a ***short term negative*** impact on fauna which are likely to be displaced during construction works. As the area is already in a developing commercial/industrial area the overall operational noise levels will not change significantly.

Land, Soils, Geology and Hydrogeology on:

Noise

16.29 Impacts associated with excavation works will be transient in nature and have a short term negative impact on the noise environment, which will be mitigated by the implementation of the CEMP. The effect will be ***slight, negative*** and ***short term*** in duration***.***

Landscape and Visual on:

Traffic and Transportation

16.30 The establishment of site enclosures, construction traffic access routes, construction vehicular activity, site lighting and temporary traffic management regimes will cause disruption during the construction of the Proposed Development. Effects on landscape character during construction will be ***temporary*** to ***short-term*** and will generally vary from ***slight/not significant*** to ***significant/moderate***, and from ***neutral to negative.*** Effects on views during construction will be ***temporary*** to ***short-term***, and will

vary from ***moderate*** to ***imperceptible***, and from ***neutral*** to ***negative***. Residual impacts on landscape and visual effects from the wider locality will be not significant or imperceptible.

Summary

16.31 In summary, the interactions between the environmental factors and impacts discussed in this EIA Report have been assessed and the majority of interactions are ***neutral.***

Table 17.1 Overview of potential interactions

Interaction	Planning and alternatives	Population and human health	Biodiversity	Land, Soils, Geology and Hydrogeology	Hydrology	Noise & vibration	Air Quality & Climate	Landscape and visual impact	Traffic	Cultural Heritage	Waste Mngmnt	Material assets
Planning and alternatives		✓	x	x	x	x	x	x	x	x	x	x
Population and human health			✓	✓	✓	✓	✓	x	x	x	x	✓
Biodiversity				✓	✓	✓	✓	x	x	x	x	x
Land, Soils, Geology and Hydrogeology					✓	✓	✓	x	x	x	✓	x
Hydrology						x	✓	x	x	x	✓	✓
Noise & vibration							x	x	x	x	x	x
Air Quality & Climate								x	x	x	x	x
Landscape and visual impact									✓	x	x	x
Traffic										x	x	x
Cultural Heritage											x	x
Waste management												x
Material Assets												

✓ - positive interactions between factors

✓ - neutral interactions between factors

✓ - negative interactions between factors

X – no interaction of note

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