Planning Application to An Bord Pleanála

Environmental Impact Assessment Report

Kishoge Substation Gridline Connection

Prepared by

AWN Consulting

August 2022

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1.0 INTRODUCTION

1.1 PROPOSED DEVELOPMENT

This Environmental Impact Assessment (EIA) Report has been prepared on behalf of Edgeconnex Ireland Ltd. herein referred as 'the Applicant') to accompany a planning application to An Bord Pleanála for planning permission for The proposed development primarily comprises the provision of a new the provision of underground 110kV transmission line connections between the Kishoge 110kv Gas Insulated switchgear (GIS) substation on a site within the townland of Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin, and the permitted Aungierstown – Castlebaggot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnel, Dublin 22. The proposed transmission lines provide for a loop-in connection to the permitted Aungierstown – Castlebaggot underground transmission line along with associated and ancillary works.

The proposed development is located within the townlands of Ballymakaily, Clutterland, Grange, Ballybane, Kilmactalway, Milltown, and Aungierstown and Ballybane. The application site has an area of 3.78 hectares.

The development will be operated by ESB Networks. (herein referred to as 'the Operator'). Figure 1.1 presents a site layout plan showing the position of the substations and the route of the proposed underground cable installation.

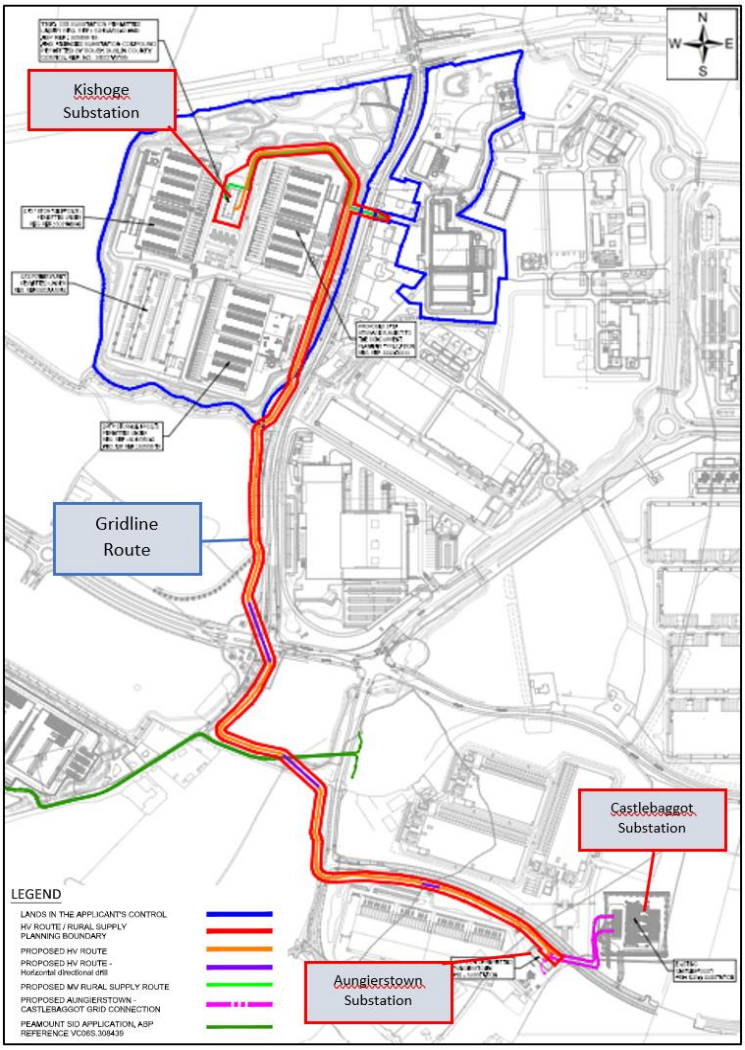

Figure 1.1 *Illustrates the position of the Kishoge Substation and Gridline route (Extract from CSEA Proposed Overall Route Plan ESSDUB98-CSE-01XX-DR-C-2120)*

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

The Kishoge 110kV transmission cable installation will be designed to support current power demand of the permitted EdgeconneX Datacentre and future growth within the Grangecastle area.

DUB 04 is permitted under Planning Reg. SD19A/0042 and ABP ref. 305948-19 and construction is due to commence in Q4 of 2022. The proposed DUB 05 datacentre and gas powered generation plant is permitted under SD21A/0042, SD22A/0105 and SD22A/0289 and construction is due to commence in Q1 of 2023.

1.2 CONTEXT

1.2.1 Legislative Requirements

This application is being made under the Planning and Development (Strategic Infrastructure) Act 2006, Section 182A to 182E.

The requirement for EIA for certain types and scales of development is set out in the EIA Directives (85/337/EEC, 97/11/EC, 2003/35/EC, 2008/1/EC and most recently 2014/52/EU) and given primary effect in Ireland by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, 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 2014 EIA Directive (2014/52/EU) and associated Irish legislation (referred to above).

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. The project proposed is not listed under Annex I EIA Directives. An EIA report has been provided as the proposed development will connect the data centres, Kishoge substation and Gas Power Generation Plant at the townland of Ballymakaily and an EIA was completed for these developments.

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 (previously referred to as an Environmental Impact Statement or EIS) 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.

1.2.2 Format of the EIA Report

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 Format Structure following the guideline structure set down in the Environmental Protection Agency (EPA) "*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports" (*2022).

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.

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
- Residual Impacts

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

A Schedule of Mitigation measures to be implemented as part of the proposed development is included in Appendix 1.1.

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

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 15 shows where interactions have been identified and how they have been addressed.

1.2.3 Need for the Development

The Kishoge 110kV transmission cable installation will be designed to support the power demand of the EdgeconneX Datacentres and the future growth within the Grangecastle area.

The project is required to provide necessary infrastructure between the permitted Kishoge Substation and the permitted 110kV transmission cable between Aungierstown and Castlebaggot Substations. The connection between the Aungierstown and Castlebaggot Substations is expected to be completed in 2022 and the construction of the permitted Kishoge Substation is expected to commence in Q4 of 2022.

1.3 COMPANY BACKGROUND

The Operator (ESB Networks) is a subsidiary within ESB Group and are the licensed operators of the electricity distribution system in the Republic of Ireland. They are responsible for building, operating, maintaining and developing the electricity network and serving all electricity customers across the country. ESB Networks performs its transmission related functions under the direction of Eirgrid. The Operator is committed to running its business in the most environmentally friendly way possible.

The applicant provides data storage, management and dissemination. To date, the Applicant has developed a number of data facilities in Ireland and are a significant Irish employer.

1.4 CONSULTATION

The Applicant met with An Bord Pleanala to confirm the development was a SID application and to discuss the scope for the planning application. Consultation has also been undertaken with the planned operator ESB Networks to ensure the project design meets their requirements.

In addition, the relevant specialists and project engineers (CSEA) have liaised with typical statutory bodies (including Irish Water, Inland Fisheries Ireland (IFI), SDCC, Eirgrid, ESB, NPWS etc.) by correspondence during the course of the EIA Report preparation. AWN Consulting and CSEA met with IFI on site in March 2022 to discuss the development crossing the River Griffeen. The concerns raised by the IFI were considered as part of the project design. A horizontal directional drill (HDD) has been agreed to install the HV gridline beneath the River Griffeen. This HDD mitigates risks to the River Griffeen which is discussed in Biodiversity Chapter of this EIAR. Engagement with NPWS was conducted in the context of an Otter Holt and the HDD approach. This consultation included a site meeting on 5th July 2022, the method statement of the HDD was discussed which ensures the launch and receiving pits for the HDD are positioned a minimum of 50 meters from the identified Holt. Further details are included in the Biodiversity Chapter of this EIAR.

AWN and the other respective EIA contributors have incorporated advice and comments received from consultees into the relevant chapters of this EIA Report.

1.5 REGULATORY CONTROL

The proposed transmission of electricity is not an EPA regulated activity in terms of the Industrial Emissions Directive (which replaced the IPPC directive). The operator will ensure the relevant regulatory requirements relating to power activities are met.

1.6 CONTRIBUTORS TO THE EIA REPORT

The preparation and co-ordination of this EIA Report has been completed by AWN Consulting in conjunction with specialist subcontractors. Specialist inputs were provided by the following (Table 1.1):

Role		Company
EIA Project Management		AWN – Teri Hayes
Engineering Design		Clifton Scannell Emerson & Associates (CSEA)
EIA Chapter No.	Chapter Title	Company & Consultant
	Non-Technical Summary	AWN – Input from each specialist
Chapter 1	Introduction	AWN – Teri Hayes / Conor McKeon
Chapter 2	Description of the Proposed Development	AWN – Teri Hayes / Conor McKeon
Chapter 3	Planning and Alternatives	AWN – Teri Hayes / Conor McKeon
Chapter 4	Population and Human Health	AWN – Teri Hayes / Conor McKeon / Jovana Arndt / Dr. Edward Porter / Mike Simms
Chapter 5	Land, Soils, Geology & Hydrogeology	AWN – Paul Conaghan / Teri Hayes
Chapter	Hydrology (including Stage 1 Flood	AWN – Paul Conaghan / Teri Hayes

6	Risk Assessment)	
Chapter 7	Biodiversity (including AA)	Moore Group – Ger O'Donohoe
Chapter 8	Air Quality & Climate	AWN – Jovana Arndt / Dr. Edward Porter
Chapter 9	Noise & Vibration	AWN – Mike Simms
Chapter 10	Landscape and Visual	KFLA – Matthew Mulvey
Chapter 11	Archaeological, Architectural and Cultural Heritage	CRDS Ltd. – Dr. Stephen Mandal
Chapter 12	Traffic & Transportation	Clifton Scannell Emerson Associates – Carol Diaz Rosario / Geoff Emerson
Chapter 13	Material Assets	AWN – Conor McKeon
Chapter 14	Waste Management (including C&D Waste Management Plan)	AWN – Chonall Bradely
Chapter 15	Interactions- Interrelationship between the Aspects	AWN – Teri Hayes

Table 1.1 Roles and Responsibilities in the EIA Report

Project Manager/EIA Co-ordinator/Selected Chapters, **Teri Hayes,** BSc MSc PGeo. Teri is a Director with AWN Consulting with 27 years of experience in EIA and water resource management. Teri is a professional member of the International Association of Hydrogeologists (Irish Group) – former president and a professional member of the Institute of Geologists of Ireland She has project managed and contributed to numerous environmental impact assessments and design of appropriate mitigation measures, acted as an expert witness at public hearings, lectured in EIA for post graduate classes and providing expert advice on EIA sections for planning authorities

Project Manager/EIA Co-ordinator/Selected Chapters, Conor McKeon, is a Senior Environmental Consultant in the Consulting Team at AWN, with over 10 years' experience working in the geology and environmental science fields. Conor holds a degree in Geology from Trinity College Dublin. Conor has worked on a wide range of projects including site investigations, contaminated land, project management and environmental impact assessments.

Land, Soils, Geology & Hydrogeology, Hydrology Paul Conaghan, is an Environmental Consultant with over 10 years' experience working in the environmental science and environmental engineering fields. Paul holds a degree in Environmental Science from the University of Limerick and a masters in environmental engineering from Queens University Belfast. Paul has worked on a wide range of projects including hydrogeology, contaminated land, project management, site geotechnical evaluations, site assessments specialising in environmental impact assessment. Paul is a member of the International Association of Hydrogeologists.

Waste Management (including C&D Waste Management Plan) Chonaill Bradley, (Bsc ENV AssocCIWM) of AWN Consulting. Chonaill Bradley is a Principal Environmental Consultant in the Environment Team at AWN. He holds a BSc in Environmental Science from Griffith University, Australia. He is an Associate Member of the Institute of Waste Management (CIWM). Chonaill has over seven years' experience in the environmental consultancy sector and specialises in waste management.

Biodiversity/Appropriate Assessment, Ger O'Donohoe, Ger graduated from GMIT in 1993 with a B.Sc. in Applied Freshwater & Marine Biology and completed an M.Sc. in Environmental Sciences, graduating from TCD in 1999. Ger has over 20 years of experience as an environmental consultant with experience in the planning and management of numerous complex Environmental Impact Assessments for large scale developments nationwide. He has wide ranging experience as an expert witness at public hearings.

Air Quality & Climate, Dr. Jovanna Arndt is an Environmental Consultant in the Air Quality section of AWN Consulting. She holds a BSc (Hons) in Environmental Science from University College Cork and completed a PhD in Atmospheric Chemistry at University College Cork in 2016. She is a Member of the Institute of Air Quality Management and specialises in assessing transportation impacts on air quality using dispersion modelling and source apportionment of particulate matter. Jovanna has been involved in assessing air quality impacts from major Highways England road schemes, Clean Air Zones and major rail infrastructure in the form of HS2. She has also provided Air Quality Action Plan (AQAP) and Air Quality Management Area (AQMA) support to several UK councils.

Air Quality & Climate, Dr. Edward Porter is a Director with responsibility for Air Quality & Climate within AWN. He holds a BSc(Hons) from the University of Sussex (Department of Chemistry), has completed a PhD in Environmental Chemistry (Air Quality) in UCD and is a Full Member of the Royal Society of Chemistry (C Chem MRSC). He specialises in the fields of air quality, EIA and air dispersion modelling.

Noise & Vibration, Mike Simms (Senior Acoustic Consultant) holds a BE and MEngSc in Mechanical Engineering, and is a member of the Institute of Acoustics and of the Institution of Engineering and Technology. Mike has worked in the field of acoustics for over 20 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

Archaeology Cultural Heritage, Dr Stephen Mandal holds an honours science in geology (1991) and a PhD in geoarchaeology (1995) from Trinity College Dublin. He is founder and managing director of CRDS Ltd (established in 1997; incorporated in 1999), archaeological, cultural and architectural heritage consultants. He has over 25 years' experience in the management of archaeological projects of all scale, from EIAR to large scale excavations. He is a professional member of the Institute of Archaeologists of Ireland, the Institute of Geologists of Ireland, and the European Federation of Professional Geologists.

Landscape Architect, Matthew Mulvey, is a Senior Landscape Architect at Kevin Fitzpatrick Landscape Architecture Ltd., with 5 years' experience having worked as both assistant and project Landscape Architect on wide range of schemes varying in scale, type, location and built form, from planning to construction stage. Matthew has worked on design and landscape visual impact assessment on Data Centre projects for Interexion, Edge Connex, Cyrus One and Amazon. More recently he has acted as project landscape architect on Data Centre projects including DUB 40 and Huntstown. Work on these Data Centre projects included Substations and HV routes associated with the developments. Matthew holds a Bachelor of Science degree in Landscape Architecture from University College Dublin and is a Member of the Irish Landscape Institute.

Traffic & Transportation, Geoff Emerson, B.E., M.Sc., C.Eng., MIEI, FConsEI is a Director with Clifton Scannell Emerson Associates. Geoff has 20+ years' experience in Civil, Structural and Transportation Consulting Engineering and Project Management acting as Project Manager for strategic Road Schemes, Street Upgrades, Quality Bus Network Schemes, Sustainable Transport Schemes, Transportation Catchment Studies & Bridge Design. Geoff has also had significant experience in large-scale site developments for private clients including Green Property Ltd, Menolly Homes Ltd and Bennett Developments. Recent Structural and Engineering experience includes the N3 Mulhuddart Overbridge and Midlands Prison Extension (€26m). Clients include National Transport Authority, Fingal County Council, South Dublin County Council, Kilkenny County Council, Louth County Council, Dun Laoghaire Rathdown County Council, Meath County Council, National Roads Authority and Dublin Transportation Office. Previously while working with RPS he was involved in the M50 South – Eastern Motorway scheme

Traffic & Transportation, **Carol Diaz-Rosario**, MsC Transport Planning and Modelling. Carol is a Transportation Engineer with CSEA with over 3 years of experience in the traffic and transportation field. She has been involved in a variety of projects involving transport planning, Modelling, Traffic and Transport assessments, sustainable mobility planning, and engineering design. In addition to that, Carol has undertaken junction analysis using modelling software such as LinSing3, ARCADY, Vissim, and Vissum.

1.7 DESCRIPTION OF EFFECTS

The quality, magnitude and duration of potential effects are defined in accordance with the criteria provided in the EPA *'Guidelines on the information to be contained in Environmental Impact Assessment Reports'* (2022) as outlined in Table 1.2.

Table 1.2. Description of Effects as per EPA Guidelines (2022)

Effect Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment
	Neutral	A change which does not affect the quality of the environment
	Negative	A change which reduces the quality of the environment
Significance	Imperceptible	An impact capable of measurement but without noticeable consequences
	Not significant	An effect which causes noticeable changes in the character of the environment but without noticeable consequences
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging trends
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.
	Profound	An impact which obliterates sensitive characteristics
Duration of Effects	Momentary Effects	Effects lasting from seconds to minutes
	Brief Effects	Effects lasting less than a day

Effect Characteristic	Term	Description
	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

For the purposes of facilitating the Competent Authority in conducting Environmental Impact Assessment as defined by Annex 1 of the EU Directive, the terms "imperceptible effects", "not significant effects", "Slight effects", and "moderate effects" used within this report, while exhibiting varying degrees of impact, are all considered to be without significant consequence.

1.8 ADDITIONAL ASSESSMENTS REQUIRED

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

- **Appropriate Assessment Screening Report and Natura Impact Statement**– a screening report and NIS has been completed for the proposed development, as required under the Habitats and Birds Directive (92/43/EEC and 79/409/EEC) and is included as Appendix 8.1. of this EIA Report.

1.9 FORECASTING METHODS AND DIFFICULTIES IN COMPILING THE SPECIFIED INFORMATION

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.

2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 INTRODUCTION

As described in Chapter 1 (Introduction), the Applicant is applying to An Bord Pleanála for planning permission which comprises the provision of a new the provision of underground 110kV transmission line connections between the Kishoge 110kv Gas Insulated switchgear (GIS) substation on a site within the townland of Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin, and the permitted Aungierstown – Castlebaggot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnel, Dublin 22. The proposed transmission lines provide for a loop-in connection to the permitted Aungierstgown – Castlebaggot underground transmission line along with associated and ancillary works.

The proposed development is located within the townlands of Ballymakaily, Clutterland, Grange, Ballybane, Kilmactalway, Milltown, and Aungierstown and Ballybane. The application site has an area of 3.78 hectares.

The proposed development is described as follows:

The proposed 110kV underground transmission line connections will originate from the Kishoge 110kV GIS substation. The substation was permitted as part of the development under Reg. Ref.: SD19A/0042 and ABP Ref.: 305948-19, as amended under Reg. Ref.: SD22A/0105. The proposed 110kV underground transmission line connections extend northwards from the Kishoge 110kV substation, before proceeding to the east and then to the south, along the periphery of the lands in the ownership of the applicant, and continuing alongside the R120 before continuing to the south and crossing the R134 New Nangor Road. The route then proceeds further southward and to the southeast to cross the R120, continues to the south and then to the east (adjacent to the Old Nangor Road), crossing the Griffeen River and proceeding eastwards and then south before crossing the Baldonnel Road and proceeding eastward within lands to the south of the Grange Castle South Business Park access road, before reaching and connecting to the Aungierstown – Castlebaggot underground transmission line. The Kishoge to Aungierstown transmission line circuit will include 4 no. joint bays, while the Kishoge to Castlebaggot transmission line circuit will include 5 no. joint bays. The proposed 110kV underground transmission line connections will cover a distance of c. 2.2 kilometers.

The development includes enabling works, services diversions, joint bays, connections to the Kishoge substation and the Aungierstgown – Castlebaggot transmission line, provision of a medium voltage electricity connection to serve the Kishoge substation from an existing ESB substation to the east of the R120, landscaping, services, all associated construction works, and all ancillary works.

An Environmental Impact Assessment Report has been prepared in respect of this application.

The permitted Kishoge substation works (permitted under South Dublin County Council Reg. Ref.: SD19A/0042 and ABP Ref.: 305948-19 – Extant permission for substation and data storage facility development) is scheduled to commence construction in late Q 3 of 2022

An alteration to the permitted development and permission for further develop the site (South Dublin County Council Reg. Ref.: SD21A/0042), has been granted 19th January 2022 and the appeal period has lapsed on the 8th February 2022. On the basis of no appeals the works are scheduled to commence Q1 of 2023.

The following chapter presents a description of the proposed development as required by the relevant planning legislation, 2014 EIA Directive (2014/52/EU), European Union (Planning and Development)(Environmental Impact Assessment) Regulations 2018 and the current Draft EPA "*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports"* (2022) and Draft "*Advice Notes for Preparing Environmental Impact Statements"* (2015).

2.2 CHARACTERISTICS OF THE APPLICATION

2.2.1 Description of Design during Construction and Operation

Figures 2.1. and 2.2 below illustrates the locations of the Kishoge, Aungierstown and Castlebaggot Substations and presents a site layout plan showing the route of the proposed underground 110kV transmission line connections between the Kishoge 110kv Gas Insulated switchgear (GIS) substation on a site within the townland of Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin, and the permitted Aungierstown – Castlebaggot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnel, Dublin 22.

Travelling from the Aungierstown – Castlebaggot permitted underground 110kV transmission line the proposed transmission line follows the green verge of Profile Park roadway along the southern boundary in a north-westerly direction for c. 480 meters to Baldonnel Road, where the cable is culverted beneath the Baldonnel Road and continues northwards along the western boundary of the Baldonnel Road for c. 182 meters before continuing in a north-westerly direction towards the R120 across a greenfield site for 233 meters. There will be a horizontal directional drill (HDD) completed to install the cable beneath the Griffeen River which flows in a north-easterly direction. The cable will then be routed parallel to the R120 within a greenfield site in a northerly directions towards the New Nangor Road where horizontal directional drilling will be utilised to route the cable under the New Nangor Road. The transmission line will continue along the western boundary of the R120 within a greenfield site turning west in the EdgeConnex site c. 200 meters south of the Grand Canal. The estimated length for the transmission line installation is c.2.2km.

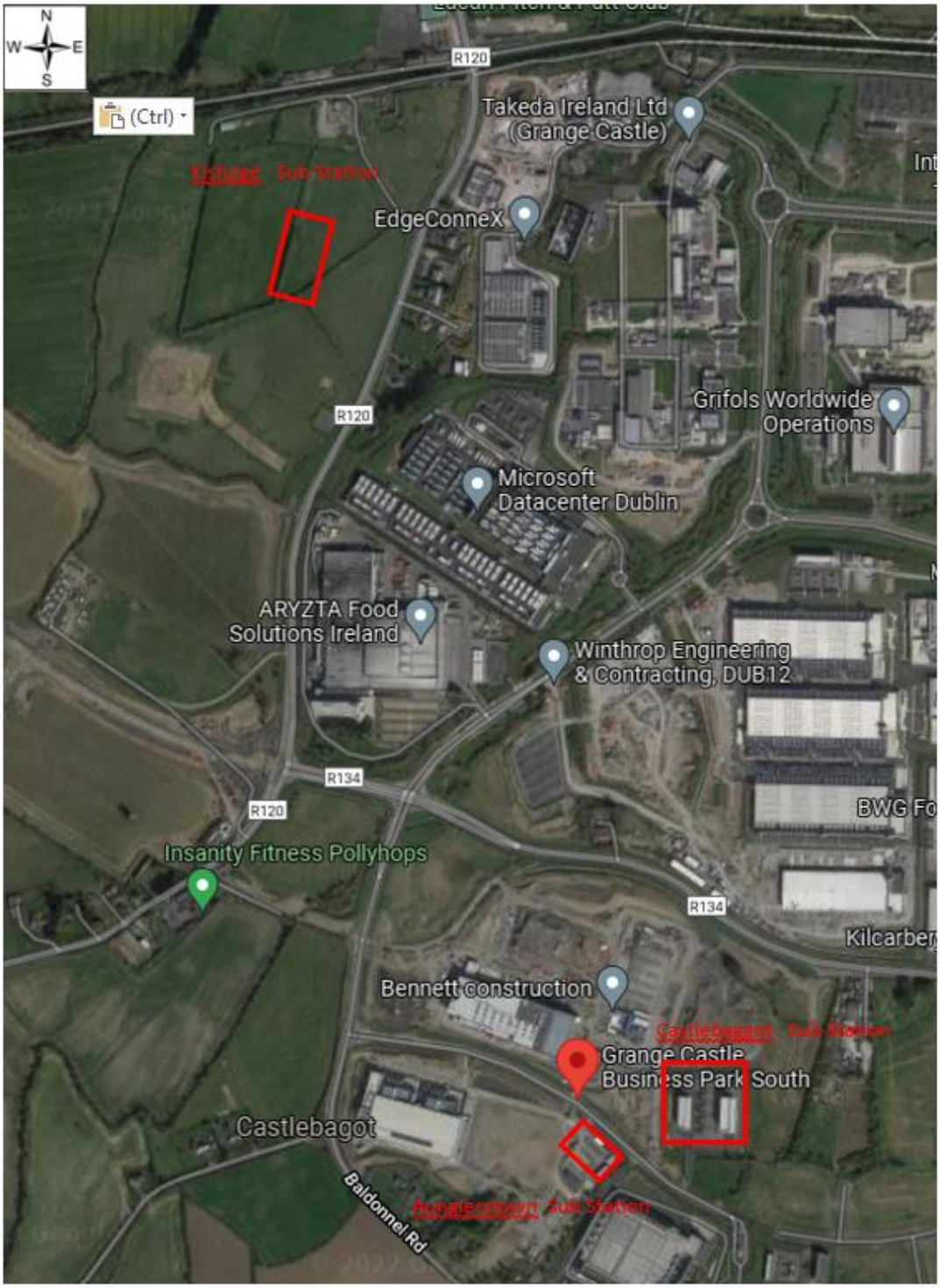

Figure 2.1: Locations of the Kishoge, Aungierstowns and Castlebaggot substations

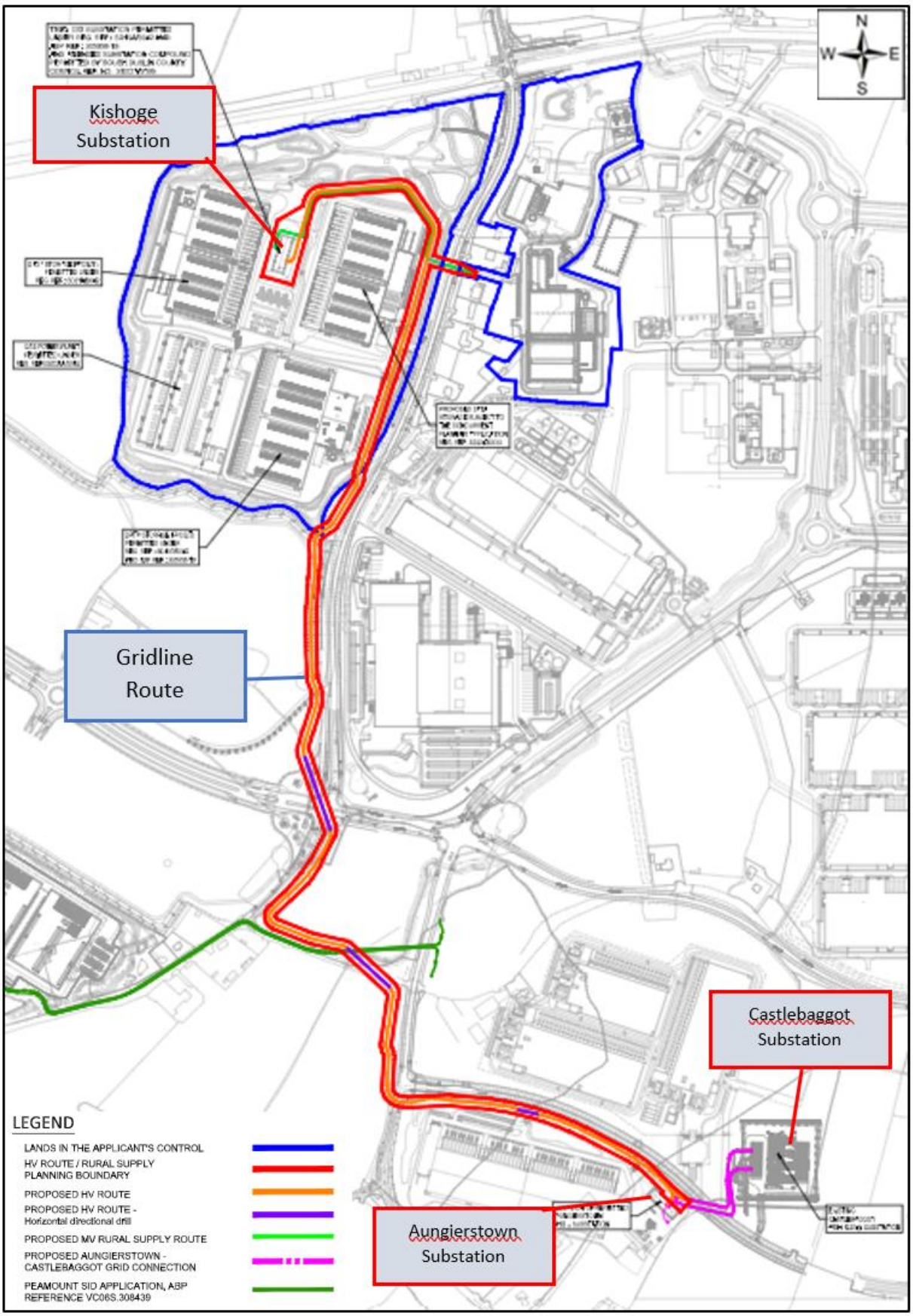

Figure 2.2: Location of route option (extract from CSEA Proposed Overall Route Plan ESSDUB98-CSE-01xx-DR-C2120)

The design of the underground cable will comprise two single transmission lines installed underground in 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 ground in the event of a failure.

The installation of the HDPE ducting will require the excavation of one trench along the route; the trench will contain two 110kV transmission lines. For the purposes of this assessment, reference to the 'cable installation' includes both transmission lines.

The optimum depth of excavation required to facilitate installation of the ducting is 1.25m below ground level (bgl) but may increase to up to c. 3m at utility crossings. The optimum width of the trench is 1.5m, however this may vary depending on ground conditions and existing services. A typical cross section of the trench is illustrated in Figure 2.3.

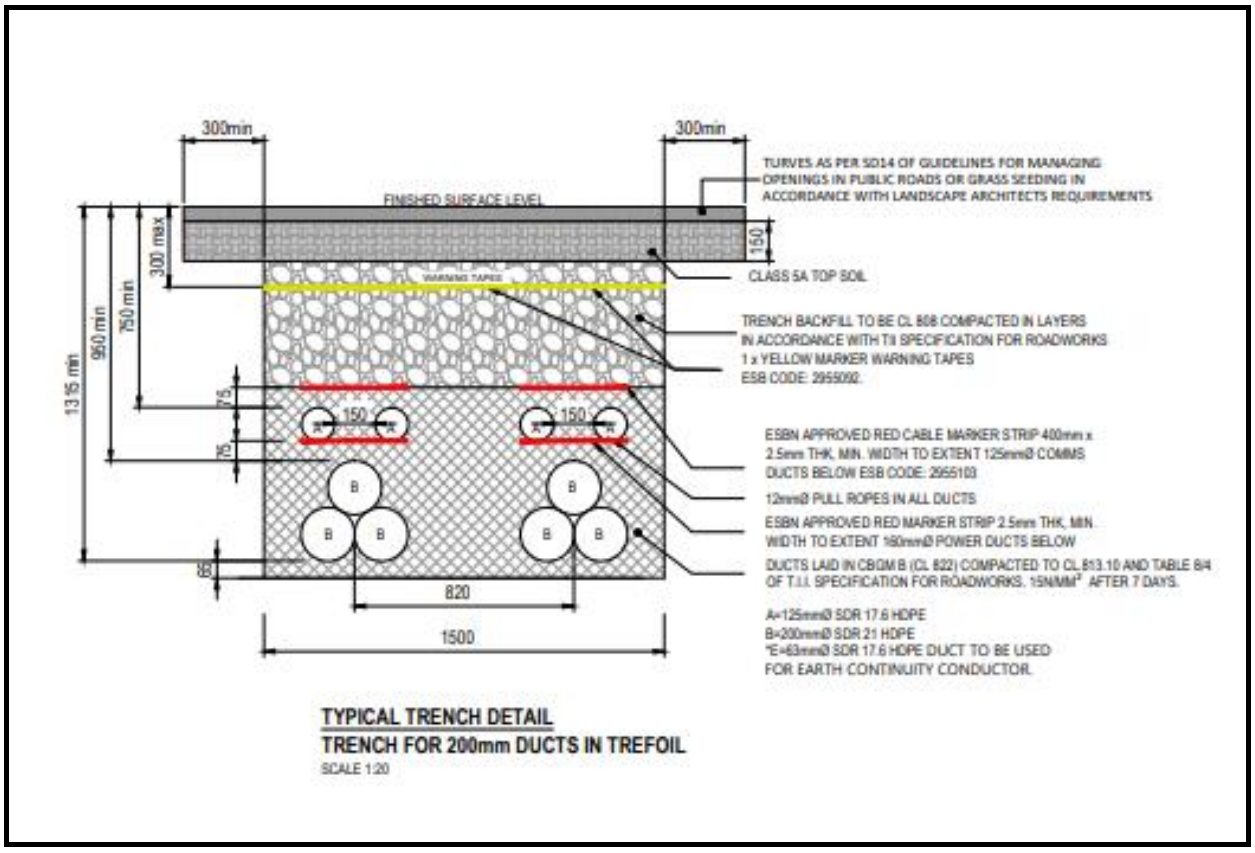

Figure 2.3 **Typical Cross Section of Trench for Underground Cable (*Source: CSEA, Jan 2022*)**

A detailed survey has been completed along the existing route to identify existing services. There is not adequate space to construct this line within the roadway and as such the route follows road verges and greenfield land.

A construction compound (including construction parking) within the Edgeconnex site at Ballymakaily West of Newcastle Road (R120), Lucan, Co. Dublin will be utilised by contractors during this development.

Once constructed, the route will be reinstated at current ground level, grassed in greenfield area and appropriate hard stand elsewhere. Nine joint bays will be

installed along the route with associated link and communications boxes. There will be 4 no. joint bays on the Kishoge to Aungierstown transmission line and 5 no. joint bays on the Kishoge to Castlebaggot transmission line. These will be covered by manhole covers. There is no requirement for lighting. The proposed cable installation is below ground and will have no overall impact on the natural landscape once completed.

2.2.2 Need for the Development

The project is designed to support the power demand of development on lands adjoining the Kishoge 110kV substation. Permission has been granted for a data storage facility and temporary gas powered generation development on adjoining lands (under the same permission as the extant Kishoge substation permission – Reg. Ref.: SD19A/0042 and ABP Ref.: 305948-19). Permission for a further a data storage facility and energy centre development is granted under Reg. Ref.: SD21A/0042.

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2.2.3 Proposed Site Infrastructure and Secondary Facilities

As the proposed development is an underground transmission line which will be reinstated following construction to ground level, there is limited site infrastructure or secondary facilities required.

Temporary security, lighting and power will be required during construction along sections of the work. For the most part no closures will be required apart form where crossings are necessary. Where crossings are required (at Baldonnell Road)these works will be undertaken at night or weekends minimising the need for traffic disruption. It is anticipated that two floodlights will be required to facilitate any potential night time working (at crossings only) which will each require a diesel generator. Where works are taking place in greenfield areas the Contractor shall construct temporary access or haul roads to facilitate access which will be reinstated upon completion of the works. Trench excavations will be temporarily supported during the works with appropriately designed trench control systems such as trench boxes or sheet piles. Temporary facilities will also be put in place to facilitate cable installation in accordance with ESB requirements.

Construction Compound and Parking
During construction, the Edgeconnex site at Ballymakaily West of Newcastle Road (R120), Lucan, Co. Dublin will be utilised.

2.3 EXISTENCE OF THE PROJECT

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

- Construction;
- Commissioning;
- Operation;
- Changes to the Project; and
- Description of Other Developments.

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

2.3.1 Description of Construction

Construction work is anticipated to commence in Q4 2022 with approximately 10 months for both the construction phase and commissioning phase prior to commencement of full operations.

2.3.1.1 Working Hours

The off-road section of the transmission line (approximately 2.2km in length) will be installed between the hours of 8am and 6pm. During installation, staff will arrive on site at approximately 7am and take circa 1 hour to mobilise before commencing works.

The on-road section of the route involves the crossing of the Baldonnell Road..
Traffic management measures will be put in place such that one lane will remain open during this element of work.

If relevant all works requiring the closure of one or more traffic lanes will be carried out at night, between the hours of 7pm and 6am.

2.3.1.2 Staffing
In general, the civil works element of work will require a higher number of staff and construction vehicles compared to the cable installation, jointing and testing. The following construction data has been used to estimate peak daily construction traffic:

- Average construction staff: 10-16;
- Peak construction staff (peak staff levels during Civil Works): 30;

2.3.1.3 Construction Schedule
A summary of the proposed target dates (earliest possible dates) for the proposed development are as follows:

- Application for Planning Permission – June 2022
- Commence Site Construction works (subject to grant of planning permission) – End Q3 2022
- Completion of Construction – Q3 2023
- Complete Commissioning Works– End Q3 2023

2.3.1.4 Site Preparation
Preparation of the site will require limited works with minima site clearance diversion on the greenfield lands. The route survey has been completed. Consultation is ongoing regarding service diversions along the road way with relevant stakeholders.

A construction compound at the Edgeconnex site at Ballymakaily West of Newcastle Road (R120), Lucan, Co. Dublin will facilitate an office, portable sanitary facilities, equipment storage, parking etc. for contractors. It will be used for the duration of the works.

2.3.1.5 Construction Works
Cut and Fill & Installation
Material from the construction trench will be excavated and removed from site for licensed disposal (7,000m3). Contractors will be required to submit and adhere to a method statement (including the necessary risk assessments) and indicating the

extent of the areas likely to be affected and demonstrating that this is the maximum disturbance necessary to achieve the required works.

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Where the installation requires crossing of the Griffeen River, it is planned to do this by HDD. A method statement for HDD has been prepared and is discussed in Chapter 7 Biodiversity. The HDD approach mitigates all risks to the river and the concerns raised by Inland Fisheries Ireland and SDCC which will be addressed further in Chapter 7 Biodiversity and Chapter 6 Hydrology.

Final Finish
Reinstatement will be as current, i.e. grassed in greenfield areas and hardstand along paved and road areas.

2.3.1.6 *Material Sourcing, Transportation and Storage*
Materials
Key materials will include cables, concrete and piping, apart from cables which are ordered by specific order for the project, a 'Just in Time' delivery system will operate to minimise storage of materials, the quantities of which are unknown at this stage.

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

Storage
Aggregate materials such as sands and gravels will be stored in clearly marked receptacles in a secure compound area within the contractors' compound at the Clonshaugh Data Storage site. 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
Construction materials will be brought to site by road. 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.

2.3.1.7 Waste Management
Chapter 13 contains a detailed description of waste management relating to construction of the proposed development. A site-specific Construction and Demolition Waste Management Plan is included as Appendix 13.1 of this EIA Report. This C&D Waste Management Plan will be refined and updated in advance of the works to ensure best practice is followed in the management of waste from the proposed development.

2.3.1.8 *Noise, Vibration and Dust Nuisance Prevention*
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) for noise and vibration control on construction and open sites, which offers detailed guidance on the control of noise and vibration from demolition and construction activities. Various mitigation measures will be applied during the construction of the proposed development, such as:

- Limiting the hours during which site activities 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.

Furthermore, a variety of practicable noise control measures will be employed. These may include:

- Selection of plant with low inherent potential for generation of noise;
- Erection of 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.

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

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.

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

- Hard surface roads will be swept to remove mud and aggregate materials from their surface. 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;
- In dry 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.

Dust nuisance control measures are discussed in further detail in Chapter 8 Air Quality and Climate.

2.3.1.9 Water Discharges

Welfare facilities will be provided for the contractors during the construction works. Portable sanitary facilities will be provided.

There is no requirement for management of surface water during construction.

2.3.1.10 Construction Impacts

Each of the following EIA Report chapters (Chapters 5-15) 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 aspects.

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.

The primary potential effects from construction are all temporary (c. 42 weeks) and are anticipated to include;

- 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;
- Effects on the waste management/land, soils, geology & hydrogeology of the site during construction i.e. removal of soil along roadways for licence disposal;
- Effects on the local road network

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

2.3.2 Description of Commissioning Operation of the Project

Commissioning and operation will be undertaken by ESB Networks/Eirgrid. Staff will undertake operation activities from the substations with only interim maintenance works along the transmission cable.

2.3.3 Changes to the Project

The lifespan of the proposed development is not defined but it is anticipated that it will be maintained and periodic upgrading over a long lifetime to meet future demand and upgrade in technology.

2.3.4 Description of Other Developments

A list of the other developments in the vicinity of the proposed development is provided in Chapter 3 Planning and Alternatives of this EIA Report.

2.4 SUSTAINABILITY ENERGY EFFICIENCY & RESOURCE USE

EirGrid, are responsible for operating and developing the national high voltage electricity grid in Ireland, ESB Networks, (Asset Owner) are responsible for carrying out maintenance, repairs and construction on the grid. Both are committed to running its business in the most environmentally friendly way possible.

2.5 HEALTH & SAFETY

2.5.1 Design and Construction Health and Safety

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

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

2.5.2 General Operational Health and Safety

EirGrid, are responsible for operating and developing the national high voltage electricity grid in Ireland, ESB Networks, (Asset Owner) are responsible for carrying out maintenance, repairs and construction on the grid. Both implements an Environmental Safety and Health Management System at each of its facilities.

2.6 POTENTIAL IMPACTS OF THE DEVELOPMENT

The proposed development is located within suitably zoned lands (zoned EE). The development, when operational, will not generate additional traffic, air, noise, water emissions or wastes generation. There will be no landscape impact as this is a below ground installation.

During construction, there is the potential for temporary nuisance impacts from traffic, dust, noise and construction waste, and impact of crossings on water if not carefully managed. The contractors will be required to implement a CEMP and incorporating mitigation as outlined in this EIAR to ensure each of these potential impacts are minimised.

Each chapter of this EIA Report assesses the potential impact of the construction and operation of the proposed development on the receiving environment including cumulative impacts. Please refer to each specialist chapter respectively.

2.7 MAJOR ACCIDENTS/DISASTERS

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

Landslides, Seismic Activity and Volcanic Activity
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 5 Land, Soils, Geology & Hydrogeology.

Flooding/Sea Level Rise
The potential risk of flooding on the site was also assessed. A Stage 1 Flood Risk Assessment was carried out and it was concluded that the development is not at risk of flooding. Furthermore, it is not expected that the proposed development would adversely impact on flood risk for other neighbouring properties. Further detail is provided in Chapter 6 Hydrology.

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

Minor Accidents/Leaks
There is no potential for any significant leak as no bulk hydrocarbon or other chemical storage is required. There is potential for a localised impact from contractor vehicles during the construction phase. However, the implementation of the mitigation measures set out in Chapters 5 and 6 will ensure the risk of a minor/accident is low and that the residual effect on the environment is imperceptible.

2.8 RELATED DEVELOPMENT AND CUMULATIVE IMPACTS

As part of the assessment of the impact of the proposed development, the cumulative impacts of the proposed development with other developments that are currently permitted or under construction in the surrounding areas have been assessed, these developments are presented below in Table 2.1. A wider list of the developments considered is provided in Chapter 3 Planning and Alternatives. The cumulative impact assessment of the proposed development with these other developments (Table 2.1) is provided in each chapter. With mitigation, it is anticipated that there will be no significant cumulative environmental effects.

Planning Reference	Description	Status
SD21A/0241 ABP Ref.: ABP-313787-22	Construction of 2 two storey data centers with plant at roof level of each facility and associated ancillary infrastructure.	Granted following ABP Appeal 19/07/2022
SD21A/0186	Construction of a 3 storey (part 4 storey) data centre known as 'DB8' to include data halls, electrical/plant rooms including internal generators.	Granted 5/5/2022
SD21A/0167	Construction of a gas fired power plant with an electrical output of up to 125MW with associated balance of plant	Granted 19/7/2022
VA0655.309146	Construction of Aungierstown substation and Gridline connection to Castlebaggot substation	Construction on these SID works is commenced and will be completed prior to proposed gridline connection

SD21A/0042	EdgeconneX Dub 05 data centre and gas powered generation plant. (Amendments to the electrical substation compounds and structure including amendments to conditions nos. 3(ii) and (iii) permitted under SD22A/0105 and SD22A/0289 respectively)	Scheduled to Commence Q1 2023, estimated completion Q 4 2024
SD22A/0333	Edgeconnex Dub 06 data centre (2 x single storey data halls, associated plant and standby diesel generators)	Submitted for planning August 2022. Scheduled to commence Q4 2023, estimated completion Q3 2024
SD19A/0042 / ABP Ref.: 305948-19	Edgeconnex Dub 04 data centre, Kishoge substation gas powered generation plant.	Scheduled to Commence Q3 2022, estimated completion Q 4 2023
SD21A/0203	Development works on the Microsoft Campus in Grange Castle Business Park	Works are currently ongoing
SD20A/0283	Development works including the construction of new datacentre on the Microsoft Campus in Grange Castle Business Park	Works are currently ongoing
SD20A/0147	Expansion of production facilities at the Takeda Ireland Ltd. facility.	Works are currently ongoing

Table 2.1: Outlining the committed developments in the area of the proposed gridline

3.0 PLANNING AND ALTERNATIVES

3.1 INTRODUCTION

This chapter describes the proposed transmission line project within the context of the relevant South Dublin County Council (SDCC) planning policies. The latter half of the chapter addresses the consideration of "alternatives" as required under the relevant planning legislation and the prevailing EIA legislation and guidance referred to in Section 1.2.2 of Chapter 1 of this EIA Report.

The site for the proposed development incorporates a route (highlighted in navy blue below) The proposed development is located within the townlands of Ballymakaily, Clutterland, Grange, Ballybane, Kilmactalway, Milltown, and Aungierstown and Ballybane. The application site has an area of 3.78 hectares.

The following sections describe how the proposed development is in compliance with the stated and statutory requirements of South Dublin County Council with respect to planning and sustainable development.

3.2 SOUTH DUBLIN DEVELOPMENT PLAN 2022 – 2028

The Draft South Dublin County Development Plan for 2022 - 2028 was published on the 7th of July 2021. Public consultation on the Draft Plan ran until September 15th, 2021, and the plan has been adopted in August of 2022. The current application is considered under this Development Plan.

Economic Development and Employment

Objective EDE4 OBJ 12 is *"To support the Government's Making Remote Work National Remote Work Strategy and the provision of appropriate IT infrastructure and facilities (including hubs at neighbourhood level) that enable a better life-work balance enabling people to live near their place of work."*

Objective EDE5 OBJ 1 is *"To prioritise hi-tech manufacturing, research and development and associated uses in the established Business and Technology clusters to the west of the County (Grange Castle and Citywest areas) maximising the value of higher order infrastructure and services that are required to support large scale strategic investment."*

Objective EDE5 OBJ 6 is *"To ensure that business environments are facilitated according to the needs of sectors; whether they be place making objectives in urban settings or campus style landscapes that complement certain pharmaceutical and hi-tech industries."*

Policy EDE POL7 is *"Recognise the need for land extensive uses and ensure that they are located within appropriate locations having regard to infrastructural, transport and environmental considerations and the need for orderly growth."*

Energy

Objective E3 OBJ 1 is *"To reduce the need for energy, enhance energy efficiency and secure the use of renewable energy sources in refurbished and upgraded dwellings and other buildings through the design and location of new development, in accordance with relevant building regulations and national policy and guidance."*

Infrastructure and Environmental Services

Policy IE POL 5 is *"Promote and facilitate the sustainable development of a high-quality ICT network throughout the County in order to achieve social and economic development, whilst protecting the amenities of urban and rural areas."*

Objective IE5 OBJ 1 *is "To promote and facilitate the provision of appropriate telecommunications infrastructure, including broadband connectivity and other innovative and advancing technologies within the County in a non-intrusive manner."*

Objective IE5 OBJ 2 *is "To co-operate with the relevant agencies to facilitate the undergrounding of all electricity, telephone and television cables in urban areas wherever possible, in the interests of visual amenity."*

Land Use Zoning

Under the Development Plan, the lands on which the proposed underground 110kV transmission lines will be located remain zoned EE.

"Public services" use remains a permissible use under the zoning objective within the Plan.

Public services are defined in the Appendix 6 as *"A building or part thereof or land used for the provision of public services. Public services include all service installations necessarily required by electricity, gas, telephone, radio, telecommunications, television, drainage and other statutory undertakers, it includes public lavatories, public telephone boxes, bus shelters, bring centres, green waste and composting facilities."* The proposed development therefore falls into this use class.

The proposal is therefore also consistent with the County Development Plan.

3.3 NATIONAL AND REGIONAL PLANNING POLICY CONTEXT

The Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy was published by the Department of Business, Enterprise and Innovation in June 2018. The Statement notes the role which data centres play in Ireland's ambition to be a digital economy hot-spot in Europe. This policy document is of relevance to the current development proposal as the gridline will permit the permitted data storage facility and substation to be connect to the grid.

The Statement includes a section dealing with electricity infrastructure (page 8 onward refers). The Statement includes the following statement in relation to the electricity infrastructure requirements of planned and projected data centre development:

"Currently, a large portion of existing and planned data centres that are due to connect to the electricity system are expected to be in the Dublin area. Based on

existing data centres, committed expansion and expected growth, total demand could treble within the next ten years. A consistent and supportive whole of government approach will be brought to the realisation of the transmission and distribution assets required to support the level of data centre ambition that we adopt."

The current proposal constitutes the provision of infrastructure required to provide electricity for the development of the area, including permitted and under consideration datacentres. The current proposed gridline is therefore supported by this Government policy.

3.4 NATIONAL PLANNING FRAMEWORK – Ireland 2040

The National Planning Framework was published in February 2018 and contains policies which are supportive of the development of ICT infrastructure, with particular reference made to 'datacentres'.

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 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."

The current application proposes infrastructure to support the delivery of permitted data storage facility development.

The NPF further states under National Strategic Outcome 6:

"Ireland is very attractive in terms of international digital connectivity, climatic factors and current and future renewable energy sources for the development of international digital infrastructures, such as data centres. 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."

As noted above, the proposed development constitutes the development of the grid to serve a proposed data storage facility development and is therefore considered to fully accord with the foregoing strategic outcome.

The NPF states at Section 4.4 that "*Planning to accommodate strategic employment growth at regional, metropolitan and local level should include consideration of: Locations for new enterprises, based on the extent to which they are people intensive (i.e. employees/ customers), space extensive (i.e. land), tied to resources, dependent on the availability of different types of infrastructure (e.g. telecoms, power, water, roads, airport, port etc.) or dependent on skills availability."*

National Policy Objective 47 is *"In co-operation with relevant Departments in Northern Ireland, strengthen all-island energy infrastructure and interconnection capacity, including distribution and transmission networks to enhance security of electricity supply."* As set out above, the proposed development represents the development of the electricity grid to provide a secure supply to permitted and proposed development in the area.

Having regard to the above, the National Planning Framework is clearly favourably disposed to the location of ICT development and supporting infrastructure in Ireland, and the proposed development, comprising infrastructure to support permitted and currently under consideration development in the vicinity, is therefore considered to be wholly in accordance with this key body of national planning policy.

3.5 PLANNING PERMISSIONS

As part of the assessment of the impact of the proposed development, account has been taken of developments that are currently permitted or under construction within the immediate environs of the proposed route for the transmission line, including Grange Castle Business Park and surrounding areas.

The SDCC Planning Department websites were consulted in order to generate a list of granted planning permissions for the areas along the proposed transmission line that fall within the administrative areas of the Council. Permissions granted within the previous three years (since January 2018) were examined. Table 3.1 below documents the committed developments in the area of the proposed gridline. Table 3.2 below documents the planning history within the vicinity of the site of the permitted Kishoge Substation, the northwesterly section of the gridline and the area surrounding the proposed gridline has been subject to several planning permissions being granted including data centres in recent years. The following is a synopsis of these.

Planning Reference	Description	Status
SD21A/0241 ABP Ref.: ABP-313787-22	Construction of 2 two storey data centers with plant at roof level of each facility and associated ancillary infrastructure.	Granted following ABP Appeal 19/07/2022
SD21A/0186	Construction of a 3 storey (part 4 storey) data centre known as 'DB8' to include data halls, electrical/plant rooms including internal generators.	Granted 5/5/2022
SD21A/0167	Construction of a gas fired power plant with an electrical output of up to 125MW with associated balance of plant	Granted 19/7/2022
VA0655.309146	Construction of Aungierstown substation and Gridline connection to Castlebaggot substation	Construction on these SID works is commenced and will be completed prior to proposed gridline connection
SD21A/0042	EdgeconneX Dub 05 data centre and gas powered generation plant. (Amendments to the electrical substation compounds and structure including amendments to conditions nos. 3(ii) and	Scheduled to Commence Q1 2023, estimated completion Q 4 2024

	(iii) permitted under SD22A/0105 and SD22A/0289 respectively)	
SD22A/0333	Edgeconnex Dub 06 data centre (2 x single storey data halls, associated plant and standby diesel generators)	Submitted for planning August 2022. Scheduled to commence Q4 2023, estimated completion Q3 2024
SD19A/0042 / ABP Ref.: 305948-19	Edgeconnex Dub 04 data centre, Kishoge substation gas powered generation plant.	Scheduled to Commence Q3 2022, estimated completion Q 4 2023
SD21A/0203	Development works on the Microsoft Campus in Grange Castle Business Park	Works are currently ongoing
SD20A/0283	Development works including the construction of new datacentre on the Microsoft Campus in Grange Castle Business Park	Works are currently ongoing
SD20A/0147	Expansion of production facilities at the Takeda Ireland Ltd. facility.	Works are currently ongoing

Table 3.1: Outlining the committed developments in the area of the proposed gridline (as per table 2.1 in Chapter 2)

Planning Reference	Description	Applicant	Decision and Date
SD22A/006	Extension to existing above ground natural gas installation; including a regulator/meter kiosk, boiler/generator kiosk, electrical/instrumentation kiosk, underground and above ground pipework, 2.4m high chain-link and palisade fencing, light/CCTV columns and all ancillary services and associated site works.	Gas Networks Ireland	Decision Due 06/03/2022
SD21A/0364	Replacement of existing signs in approved locations including the high level signs on the western elevation of the Drug Substance Building and the northern elevation of the Administration QAQC Building with a halo lit company logo and lettering and a face lit company logo and lettering, respectively; the non-illuminated wall mounted company sign adjacent to the entrance on the northern elevation of the Administration QAQC Building with non-illuminated company logo and lettering; the non-illuminated signs on structures on the verge of the Business Park estate road to the west of the site; and the signage on the approved internally illuminated structure on the verge at the junction of the Business Park estate roads to the north west of the site. The development for retention permission consists of the retention of a non-illuminated sign installed on a structure on the verge of the Business Park estate road to the west of the site; non-illuminated signs installed on the boundary fence adjacent to two of the entrances to the site from the Business Park estate road; non-illuminated traffic direction signs installed on traffic sign poles adjacent to the southern entrance into the site and on the verge of the Business Park estate road to	Pfizer Ireland Pharmaceuticals	Grant Permission & Grant Retention 27/06/2022

Planning Reference	Description	Applicant	Decision and Date
	the west of the site; and a wall mounted non-illuminated sign with company logo and lettering adjacent to the entrance on the western elevation to the Central Utility building.		
SD21A/0346	New external Freezer Plant Platform Structure; single storey MRO Stores building within the existing construction compound; external Data Centre unit to the south of the existing Manufacturing Suites Building; airlock extension & relocated external double emergency exit doors to the south of the existing Manufacturing Suites Building; Pallet Storage building adjacent to the existing Drum Store West building within the Utility Yard and boiler Water Chemical Dosing Unit within the CUB yard and all associated site works.	Pfizer Ireland Pharmaceuticals	Granted 1st June 2022
VA06S.309146	*The proposed 110kV GIS Substation Compound is to be located on lands to the north-east of the two storey data centre facility and associated three storey office block that was permitted under SDCC Reg. Ref. SD18A/0134 / An Bord Pleanála Ref. ABP-302813-18, and within an overall landholding bound to the north by the Grange Castle South Business Park access road; to the west by the Baldonnel Road and to the south by 3 no. residential properties and the Baldonnel Road; and to the east by the Google data centre facility within the Grange Castle South Business Park, Baldonnel, Dublin 22. The site of the proposed development has an area of c. 0.9163 hectares.* *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 1,307.2sqm) (known as the Aungierstown Substation), two transformers, lighting and lightning masts, car parking, associated underground services and roads within a 2.6m high fenced compound and all associated construction and ancillary works.* *Two proposed underground single circuit 110kV transmission lines will connect the proposed Aungierstown 110kV GIS Substation to the existing 220kV / 110kV Castlebaggot Substation to the immediate north-east. The proposed transmission lines cover a distance of approximately 120m and 140m within the townlands of Ballybane, and Aungierstown and Ballybane.* *The development includes the connections to the two substations (existing and proposed), changes to landscaping permitted under SDCC Reg. Ref. SD18A/0134 / An Bord Pleanála Ref. ABP-302813-18 and all associated construction and ancillary works."*	Cyrus One	Granted 19th July 2021
06S.VA0019	An order to grant permission dated the 27th of June 2016 was issued by An Bord Pleanála for the development of a 220kV /110 kV Substation & Associated Works on land within the Grange Castle South Business Park, Baldonnel, Dublin 22. The development description for the application as outlined in the Board's own Inspector's Report was a 220/110 kV Gas Insulated Switchgear (GIS) substation compound, on an approximately three-hectare site (including associated landscaped space). The main elements of the permitted substation comprise: a 220 kV substation building of approximately 720sqm,	Eirgrid PLC	26th June 2016

Planning Reference	Description	Applicant	Decision and Date
	rising to approximately 16.6m over ground level; a 110 kV substation building of approximately 528sqm, rising to approximately 14.5m over ground level; four no. associated 220 kV to 110 kV transformers sited within transformer bunds; - associated external over ground electrical equipment and apparatus including cable sealing ends, surge arrestors, conductor support structures, post insulators, lightning monopoles (approximately 15m over ground), lighting and associated underground cabling; associated ancillary drainage works; associated site development and landscaping works; associated substation car parking (12 spaces), vehicular circulation route, and other hard surfacing; and associated 2.6m (approximately) high metal palisade substation perimeter fence, including substation entrance gates approximately 5.1m wide.		
SD21A/0241 ABP Ref.: ABP-313787-22	Construction of 2 two storey data centers with plant at roof level of each facility and associated ancillary infrastructure.	Vantage Data Centers Dub 11 Ltd.	Granted following ABP Appeal 19/07/2022
SD21A/0186	Construction of a 3 storey (part 4 storey) data centre known as 'DB8' to include data halls, electrical/plant rooms including internal generators.	Equinix (Ireland) Ltd.	Granted 5/5/2022
SD21A/0167	Construction of a gas fired power plant with an electrical output of up to 125MW with associated balance of plant	Greener Ideas Limited	Granted 19/7/2022
SD21A/0042	*Construction of two single storey data centres with associated office and service areas; and three gas powered generation plant buildings with an overall gross floor area of 24,624sq.m that will comprise of the following: Demolition of abandoned single storey dwelling, remaining agricultural shed and derelict former farm building; Construction of 2 single storey data centres (12,797sq.m), both with associated plant at roof level, with 24 standby diesel generators with associated flues (each 25m high) that will be attached to a single storey goods receiving area/store and a single storey office area (2,404sq.m) located to the west of the data centres as well as associated water tower and sprinkler tank and other services; Amendments to the internal access road and omission of access to loading bay permitted under SDCC planning Ref. SD19A/0042/ABP Ref. PL06S.305948 that include the relocation of permitted, and new, internal security gates; and new internal access roads to serve the proposed development that will provide access to 39 new car parking spaces (including 4 electric and 2 disabled spaces) and sheltered bicycle parking to serve the new data centres; The development will also include the phased development of 3 two storey gas powered generation plants (9,286sq.m) within three individual buildings and ancillary development to provide power to facilitate the development of the overall site to be located within the south-west part of the overall site. Gas plant 1 (3,045sq.m) will contain 20 generator units (18+2) with*	Edgeconnex Ireland Ltd	Decision to grant permission 19th January 2022 appeal period lapsed 8th February 2022

Planning Reference	Description	Applicant	Decision and Date
	associated flues (each 25m high) will facilitate, once operational the decommissioning of the temporary Gas Powered Generation Plant within its open compound as granted under SDCC Planning Ref. SD19A/0042/ABP Ref. PL06S.305948. Gas plant 2 (3,045sq.m) will contain 20 generator units (18+2) with associated flues (each 25m high). and, Gas plant 3 (3,196sq.m) will contain 21 generator units (19+2) with associated flues (each 25m high). These plants will be built to provide power to each data centre, if and, when required. The gas plants will be required as back up power generation once the permitted power connection via the permitted substation is achieved; New attenuation pond to the north of the site; Green walls are proposed on the southern elevation of each power plant, as well as to the northern elevation of the generator compound of the data centres, and enclosing the water tower/pump room compound, and a new hedgerow is proposed linking east and west of the site; Proposed above ground gas installation compound to contain single storey kiosk (93sq.m) and boiler room (44sq.m). The development will also include ancillary site works, connections to existing infrastructural services as well as fencing and signage. The development will include minor modifications to the permitted landscaping to the west of the site as granted under SDCC planning Ref. SD19A/0042/ABP Ref. PL06S.305948. The site will remain enclosed by landscaping to all boundaries. The development will be accessed off the R120 via the permitted access granted under SDCC planning Ref. SD19A/0042/ABP Ref. PL06S.305948. An EPA-Industrial Emissions (IE) licence will be applied for to facilitate the operation of the gas powered generation plant. An Environment Impact Assessment Report (EIAR) has been submitted with this application. All on a site of 22.1hectares.		
SD19A/0042 ABP Ref.: 305948-19	*Phased development that will include 4 single storey data halls all with associated plant at roof level; 32 standby generators with associated flues (each 15m high); associated office and service areas; service road infrastructure and car parking; ESB sub-station/transformer yard with an overall gross floor area of 17,685sq.m; temporary gas powered generation plant within a walled yard containing 19 generator units with associated flues (each 17m high) to be located to the west of the proposed data halls on a site within the townland of Ballymakaily; Phase 1, 2 single storey data halls (6,950sq.m.) with roof plant and 16 stand-by generators with associated flues (each 15m high) as well as associated water tower and pump room and other services; single storey goods receiving area/store and single storey office area (1,522sq.m.) located attached and to the north-east of the data halls; temporary gas powered generation plant with 15 generators with associated flues (each 17m high) to be located within a compound to the west of the proposed data halls; attenuation pond; two storey ESB sub-station (494sq.m) with associated transformer yard and single storey transformer building (247sq.m) within compound; Phase 2, 2 single storey data halls (6,950sq.m.) with roof plant and 16 stand-by generators with associated flues (each 15m high) as well as associated water tower and pump room and other*	Edgeconnex Ireland Ltd	5th October 2020

Planning Reference	Description	Applicant	Decision and Date
	services; single storey goods receiving area/store and single storey office area (1,522sq.m) located attached and to the east of the data halls under this Phase and attached and to the north of the offices proposed under Phase 1; 4 additional generators with associated flues (each 17m high) to be constructed within the temporary gas powered generation plant; also ancillary site works; connections to existing infrastructural services as well as fencing; signage; vehicular access off the realigned R120 to provide a new vehicular access into the site as well as internal service roads and entrance gates; car park for 39 car parking spaces (including 4 disabled car parking spaces); sheltered bicycle parking to serve the development. The development will be enclosed with landscaping to all boundaries of the overall site of 22.1ha. Application for enabling works to facilitate this development has been made under Reg. Ref. SD19A/0004.		
SD21A/0028	Construction of a 145m x 85m all-weather pitch; mesh fencing; ball stop netting; 8 16m high lighting masts; floodlights and all associated works	Lucan Sarsfield GAA Club	REQUEST ADDITIONAL INFORMATION 07/04/2021
SD21A/0288	Erect 329sq.m or 67.34 KWp of photovoltaic panels on the roof of the building DUB12 in data centre; all associated site works	Microsoft Ireland Operations Limited	Granted 08/12/2021
SD21A/0203	Modifications and minor additions to previously approved scheme (Planning Register Reference SD20A/0283) at this site of c.16.23ha (in total) comprising of the following changes to previously approved scheme SD20A/0283; Approved Central Administration Building (CAB), relocation of building to the east by approx. 7m; reconfiguration and setting out of building plans at all levels (including roof level) resulting in increase in building footprint of approximately 170sq.m (from 1,424sq.m to 1,594sq.m) associated changes to building elevations (design and finishes); approved single storey Cafeteria Element, additional basement level below cafeteria to accommodate plant; 9 rooflights (2.8 m diameter) and 9 rooflight (1.8m diameter), inclusion of MEP Plant on roof level including new flue extending approx. 1m above parapet; approved four-storey Office element, parapet at roof level to be raised by approx. 1.1m (increased from approved 19.5m in height to proposed 20.6m); overall increase in GIFA of 395sq.m; reconfiguration of area available for PV panels and sedum roof finish in order to accommodate required MEP equipment at roof levels. approved Data Centres - DUB14 and DUB15, reconfiguration and setting out affecting building locations and plans at all levels (including roof level) resulting in reduction in overall building footprint (for each building) by 48sq.m (from 13,442sq.m to 13,394sq.m), associated changes to staircases design, building elevations design and finishes, increase in parapet height of Vent Houses (at roof level) by approx. 350mm and omission of previously proposed zone of sedum roof finish; overall decrease in GIFA of 1,352sq.m in respect of DUB 14 and decrease of 1,453sq.m in respect of DUB 15; all plant equipment at ground level - reduced in height compared to approved layout so that the screening is deemed not required; DUB 14, reduction in height of	Microsoft Ireland Operations Limited	Granted 10/11/2021

Planning Reference	Description	Applicant	Decision and Date
	approved flues by approx. 650mm, reduction in number of flues from 11 approved to 8 proposed; DUB 15, change to level of ground floor and associated increase in overall building height of approx. 700mm (parapet height increased from approved +83.0m O.D. to proposed +83.7m O.D.); reconfiguration of associated external plant at ground level (including generators / E-Houses & transformers) flues, omission of approved Modular Electrical Rooms (MERs) and associated screening serving approved Data Centres DUB14 &15; relocation, modifications to design and expansion of approved Water Treatment Building and associated plant to include, Water Treatment Tanks, 2 sprinkler tanks and relocated approved pump house (contained in the main Water Treatment Plant building) and 1 generator with additional proposed flue stack (height 30.75m) and 1 transformer; Gas Generator Compound - Relocation & reconfiguration of previously approved gas generator compound including, additional 4 generators (from 20 approved to 24 proposed), omission of approved E-houses; additional 7 electrical rooms, additional 7 flues (from 5 approved to 12 proposed); modifications to approved layout of internal site roads, yards and footpaths; relocation and modifications to design of approved Sprinkler Tanks and Pump Houses, Pump House serving DUB 14, relocated into proposed Water Treatment Building and compound, redesign of approved larger tank into proposed two smaller tanks; Pump House serving DUB 15, relocated to south of DUB15 the north facilitate space for electrical equipment redesign of approved larger tank into proposed two smaller tanks; relocation of Approved Gas Networks Ireland (GNI) gas skid & compound including approved 3 kiosk buildings; modifications to approved car park layouts and landscaping design; modifications to location and design of approved bicycle shelters; modifications to site development works, including underground water and building services provision, landscaping, internal security and compound enclosure fencing, and associated works; the remainder of the development (including permitted temporary construction car parking) to be carried out in accordance with parent permission SD20A/0283. An Environmental Impact Assessment Report (EIAR) has been submitted with this application; The application relates to a development which comprises an activity requiring an integrated pollution prevention and control (IE) licence relating to lands located west of the existing MS Data Centre Campus and also a site located north of the main entrance to the business park from Grange Castle Road.		
ABP-309951-21	The provision of two 110kV transmission lines along with associated and ancillary works. The proposed transmission lines will connect the permitted and under construction Coolderrig 110kV Gas Insulated Switchgear (GIS) substation compound that was granted permission under SDCC Reg. Ref. SD18A/0298 with the existing Grange Castle - Kilmahud Circuits. The site of the proposed development has an area of c. 1.49 hectares. The two proposed underground single circuit 110kV transmission lines will connect the permitted Coolderrig 110kV GIS Substation, within the existing Edgeconnex landholding, to the existing Grange Castle - Kilmahud Circuits to the east. The proposed transmission lines	Edgeconnex Ireland Ltd	09/06/2021 Returned to ABP

Planning Reference	Description	Applicant	Decision and Date
	cover a distance of approximately 559m and 574m within the townland of Grange, Dublin 22. The route of the transmission lines will pass along and under the internal road infrastructure within the Edgeconnex site and Grange Castle Business Park; above the culverted Griffeen River and along a wayleave to the north of the Griffeen River to the joint bays where it will connect into the Grange Castle - Kilmahud Circuits. The development includes the connections to the permitted Coolderrig substation as well as to the Grange Castle - Kilmahud Circuits, as well as changes to the landscaping within the Grange Castle Business Park and all associated construction and ancillary works. The permitted and under construction Coolderrig 110kV Gas Insulated Switchgear (GIS) substation includes a two storey GIS Substation building (with a gross floor area of 556sqm) (known as the Coolderrig Substation), associated underground services; 2 transformers and single storey MV switch room (180sqm) within a 2.6m high fenced compound, and all associated construction and ancillary works. An Environmental Impact Assessment Report has been prepared in respect of this application		
SD20A/0283	Demolition of existing single storey vacant house, garage and outhouse (total gross floor area (GFA) c.291.2sq.m) and removal of existing temporary construction car park; Construction of a single 1-4 storey Central Administration Building and 2 2-storey (with mezzanine) data centres (DUB14 & DUB15) all to be located west of data centres DUB9, DUB10, DUB12 & DUB13 within the MS campus; The Central Administration Building (c.6.03m to c.19.85m high) will comprise central office administration, with staff cafeteria, staff gym and reception (GFA c.3,520sq.m), with provision of PV panels on the roof; each data centre (c.15.6m high to parapet height and c.18.65m to top of roof plant) will include data halls, admin blocks (comprising offices, canteen, loading dock, storage and ancillary areas) and a variety of mechanical and electrical plant areas/structures including Modular Electrical Rooms (MERs), battery rooms and transformer areas. GFA of DUB14 is c.28,072sq.m and GFA of DUB15 is c.28,173sq.m (c.56,246sq.m in total); DUB14 will also include 21 diesel generators and associated sub-stations (E-houses) and 11 mechanical flues (each c.30.75m high); Provision of a gas generator compound (to serve DUB15) containing 20 generators, 5 E-houses and 5 flues (c.25m max height); Provision of a Gas Networks Ireland gas skid including 3 kiosk buildings; Expansion of existing electrical sub-station compound (originally granted under SD07A/0632) to provide 3 additional transformer bays. 3 E-houses and 1 control room, 2 auxiliary transformers; 2 sprinkler tank and pump house areas, 1 additional rainwater harvesting plant; Provision of 168 permanent car parking spaces and 40 cycle parking spaces; Provision of additional western access to the MS campus (to serves the Central Administration Building) from the Business Park estate road (including bridge over the Griffeen River) with existing temporary access to be extinguished; Physical integration with the remainder of the existing MS campus (including internal access roads and landscaping) with associated modifications to the western boundary of the DUB09/DUB10/DUB12/DUB13 data centre	Microsoft Operations Ireland Ltd	Granted 29/03/2021

Planning Reference	Description	Applicant	Decision and Date
	development as permitted under SD16A/0088; Provision of a new temporary construction car park (with 802 car spaces, shuttle bus stop and shelter) on site north of the main entrance to the business park; Total gross floor area of the development will be c.59,766sq.m; All associated site development works, drainage and services provision, landscaping, boundary treatments (including security fencing) and associated works; An Environmental Impact Assessment Report (EIAR) has been submitted with this application; The application relates to a development which comprises an activity requiring an integrated pollution prevention and control (IE) licence.		
C7SD20A/0147	Construction of P3 Phase II expansion of the existing P3 biopharma production facility which includes the construction of a circa 2,155sq.m, two storey biopharma production facility to a maximum height of circa 14.9m to be located to the south of the existing P3 building; single storey administration extension of circa 210sq.m to a maximum height of 4m to the north of the existing P3 building and internal modifications to the existing P3 building in addition to all associated site works including delivery area; courier pick up/drop off area with 5 parking spaces (including 1 accessible parking space and 1 E-car space); extension to existing external utilities yard (circa 485sq.m) for 3 heat pumps and other ancillary equipment; new internal site circulation road and re-alignment of existing circulation road; 48 additional car parking spaces (including 3 accessible parking spaces and 5 E-car spaces); 24 covered bicycle stands, hard and soft landscaping and external lighting; there will be temporary site entrance and associated temporary access road located to the south east of the site during the construction phase all on 3.68 Hectare application site located within the Takeda Ireland facility at Grange Castle Business Park; an EIAR (Environmental Impact Assessment Report) is submitted with the application and relates to development comprising of an activity which requires and Industrial Emissions Licence in accordance with the First Schedule of the EPA Act 1992 as amended. Compliance with condition 7	Takeda Ireland Ltd.	Compliance with Conditions - Not for PA
C2SD20A/0147	Construction of P3 Phase II expansion of the existing P3 biopharma production facility which includes the construction of a circa 2,155sq.m, two storey biopharma production facility to a maximum height of circa 14.9m to be located to the south of the existing P3 building; single storey administration extension of circa 210sq.m to a maximum height of 4m to the north of the existing P3 building and internal modifications to the existing P3 building in addition to all associated site works including delivery area; courier pick up/drop off area with 5 parking spaces (including 1 accessible parking space and 1 E-car space); extension to existing external utilities yard (circa 485sq.m) for 3 heat pumps and other ancillary equipment; new internal site circulation road and re-alignment of existing circulation road; 48 additional car parking spaces (including 3 accessible parking spaces and 5 E-car spaces); 24 covered bicycle stands, hard and soft landscaping and external lighting; there will be temporary site entrance and associated temporary access road located to the south east of the site during the construction phase all on 3.68 Hectare application site located within the Takeda Ireland facility at Grange Castle Business Park;	Takeda Ireland Ltd.	Compliance with Conditions - Not for PA

Planning Reference	Description	Applicant	Decision and Date
	an EIAR (Environmental Impact Assessment Report) is submitted with the application and relates to development comprising of an activity which requires and Industrial Emissions Licence in accordance with the First Schedule of the EPA Act 1992 as amended. Compliance with condition 2		
SD20A/0147	Construction of P3 Phase II expansion of the existing P3 biopharma production facility which includes the construction of a circa 2,155sq.m, two storey biopharma production facility to a maximum height of circa 14.9m to be located to the south of the existing P3 building; single storey administration extension of circa 210sq.m to a maximum height of 4m to the north of the existing P3 building and internal modifications to the existing P3 building in addition to all associated site works including delivery area; courier pick up/drop off area with 5 parking spaces (including 1 accessible parking space and 1 E-car space); extension to existing external utilities yard (circa 485sq.m) for 3 heat pumps and other ancillary equipment; new internal site circulation road and re-alignment of existing circulation road; 48 additional car parking spaces (including 3 accessible parking spaces and 5 E-car spaces); 24 covered bicycle stands, hard and soft landscaping and external lighting; there will be temporary site entrance and associated temporary access road located to the south east of the site during the construction phase all on 3.68 Hectare application site located within the Takeda Ireland facility at Grange Castle Business Park; an EIAR (Environmental Impact Assessment Report) is submitted with the application and relates to development comprising of an activity which requires and Industrial Emissions Licence in accordance with the First Schedule of the EPA Act 1992 as amended Takeda Ireland Ltd.	Takeda Ireland Ltd.	Granted 08/10/2020
C11SD18A/0134	Demolition of the existing single storey house of 'Erganagh' and the construction of a two storey data centre and delivery bays with associated three storey office block and services that will have a gross floor area of 35,426sq.m on an overall site of 9.2 hectares. The two storey data centre facility and delivery bay (32,419sq.m) will be separated into two adjoined blocks over two floors with a single data hall on each floor of each data centre with service and technical space around each data hall (4 data halls overall) with a two storey delivery bay attached to the east of the data centre block. A three storey office block and delivery bay (2,882sq.m) is attached to the west of the data centre block. The data centre will be served by services and plant to the north of the data centre blocks that will include 32 standby generators with 2 associated flues per generator (64 in total) and grouped into 16 towers of flour flues each (each 20m high). There are proposed to be 32 acoustically attenuated chillers located on the upper level plant gantries to the north of the data hall blocks (eight on each gantry). The development will also include a new substation with associated transformer yard and single storey transformer building (125sq.m) that will be located to the northeast of the site. The development will be accessed from the Grange Castle South Access Road from the north via the Baldonnel Road and will also include ancillary site development works, including 2 attenuation ponds, to connect to existing Grange Castle infrastructural services as well as fencing, signage, services road,	CyrusOne Irish Datacentres Holdings Ltd.	Compliance with Conditions – Non PA

Planning Reference	Description	Applicant	Decision and Date
	entrance gate, 70 car parking spaces including 3 disabled car parking spaces, and 30 sheltered bicycle parking spaces. The development will be enclosed with landscaping to all frontages including a wetland to the west all on a site (9.2ha) located within lands in the Grange Castle Business Park South and the residential properties of Erganagh, Kent Cottage and Weston Lodge on land with the townlands of Aungierstown and Ballybane; Ballybane; and Milltown and bounding Baldonnel Road to the west and south and Grange Castle South Access Road to the north, Baldonnel, Dublin 22. An Environmental Impact Assessment Report (EIAR) has been submitted with this application. Compliance with condition 11(a).		
SD19A/0300	Single storey ESB substation (27sq.m) that will be accessed from the north off the Grange Castle South Access Road via the Baldonnel Road and off the permitted internal road granted under Reg. Ref. SD18A/0134, An Bord Pleanála Ref. ABP-302813-18 to the south; the proposal will result in a minor and temporary amendment to the landscaping and fencing permitted under Reg. Ref. SD18A/0134, An Bord Pleanála Ref. ABP-302813-18 that granted permission for a two storey data centre and delivery bays with associated three storey office block and services within the overall lands; no other changes to the permission granted under this decision are proposed under this application	CyrusOne Irish Datacentres Holdings Ltd	Granted 18/11/2019
SD19A/0004	Enabling works to facilitate the future development of the site; topsoil strip and a cut and fill operation across the site; temporary construction access will be created off the R120 to facilitate the works within the townland of Ballymakaily to the west of the Newcastle Road (R120).	EdgeConnex Ireland Limited	Granted 16/04/2019
SD16A/0176	Enabling works to facilitate the future development of the site. Enabling works will include the demolition of the existing storage and outbuildings (3,118sqm) and other temporary buildings on the site; and it's clearing as well as the diversion of existing services, including existing culvert, that traverse the site; and to level the site for future development.	EdgeConnex Ireland Limited	Granted 18/07/2016
SD16A/0214	Construction of a single storey data centre (4,435sq.m) with plant at roof level: associated support services and 6 standby generators with associated flues (each 15m high): and single storey office and loading bay (1,341sq.m) as well as an electricity sub-station (63sq.m) with a total floor area of 5,839sq.m. The development will also include ancillary site works, including attenuation tank, to connect to existing Grange Castle infrastructural services as well as fencing, signage, services road, entrance gate, 26 car parking spaces including 2 disabled car parking spaces, as well as sheltered bicycle parking. The development will be enclosed with landscaping to all frontages. An Environmental Impact Statement (EIS) has been submitted with this application. An application for enabling works to facilitate this development has been made under Reg. Ref. SD16A/0176.	EdgeConne X Ireland Ltd.	Granted 11/08/2016
SD17A/0027	Amendment of permission granted under SD16A/0345 that will relocate the temporary gas powered generation plant from lands to the rear of the Takeda Ireland complex to the east of the site, to lands to the immediate north of Phase 1 data hall and single storey office granted under SD16A/0214 and to the south of	EdgeConne X Ireland Ltd.	Granted 04/04/2017

Planning Reference	Description	Applicant	Decision and Date
	the ESB substation and transformer yard that was permitted under SD16A/0345. The relocated temporary gas-powered generation plant will be enclosed within a walled yard containing 12 generator units with associated flues (each 15m high). The development will also include new vehicular access to the temporary generator plant off the permitted service road as granted under SD16A/0214. The development will be enclosed with revised landscaping from that granted under SD16A/0214. An Environmental Impact Statement (EIS) has been submitted with this application.		
SD17A/0318	The provision of a temporary (for 3 years) 18MW gas powered electricity generator compound to provide electricity to the DUB08 data centre located within the Microsoft Data Centre Campus, in advance of the upgrade of electricity infrastructure locally. The development will include 16 generators, gas skid compound and site compound (providing control cabinets, drying room, toilets and staff canteen – total floor area of buildings c.125sq.m). Temporary access arrangements via existing construction access from business park road. Provision of 10m high acoustic screen, palisade fencing and gates, staff parking, additional landscape screening. All associated site development, service provision, landscaping and other works. The temporary generator compound will be located within campus lands subject to an extant planning permission – Reg. Ref: SD16A/0088 (4 No. data centres; DUB09, DUB10, DUB12, DUB13) and the current application represents a modification to this permission. The compound will be located across part of the footprint of permitted data centre DUB12. It is intended that DUB12 and DUB13 will be constructed and permission Reg. Ref: SD16/0088 completed following decommissioning of the temporary generator compound. An Environmental Impact Assessment Report (EIAR) has been submitted with this application.	Microsoft Operations Ireland Limited	Granted 27/10/2017

Table 3.2 Data Centre Planning Examples

It is important to note that each project currently permitted shown in the tables 3.1 and 3.2 above are subject to planning conditions which include appropriate mitigation measures to minimise environmental impacts.

3.6 ALTERNATIVES

EIA legislation and the prevailing guidelines and best practice require that EIA Reports consider 'alternatives' for projects with regard to their environmental effects addressing:

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

This chapter describes the alternatives that were considered for the proposed development, where applicable, under each of these headings and the reasons for the selection of the preferred options.

3.6.1 Do Nothing Alternative

The 'do nothing' alternative would involve not constructing the transmission line between the permitted Kishoge Substation and the permitted Aungierstown – Castlebaggot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnel, Dublin 22. This would mean the permitted EdgeConnex data centre and Kishoge substation would not be connected to the grid. In addition without this strategic piece of infrastructure, the future potential of the Grange Castle Business Park to facilitate further industrial activity could be limited.

3.6.2 Alternative Project Locations

As a key objective in the construction of the proposed transmission line is to provide support for current and future potential power demand to the permitted Kishoge substation and Edge Connex Data Storage Facility there is requirement to construct the transmission line to connect permitted site to the grid.

As part of the planning application process for the proposed transmission line, a number of alternative route options were generated as presented in Figure 3.1.

An assessment of the different proposed routes was undertaken between the permitted Kishoge substation and the permitted Aungierstown – Castlebaggot underground 110kV transmission line to determine the most appropriate route.

3.5.2.1 Selection of Preferred Transmission Route

An overall impact assessment of the candidate routes was carried out using the Description of Effects as identified in the EPA Guidelines on Information to be contained in Environmental Impact Assessment Reports (2022). Candidate routes were subject to a high level assessment in terms of the following criteria:

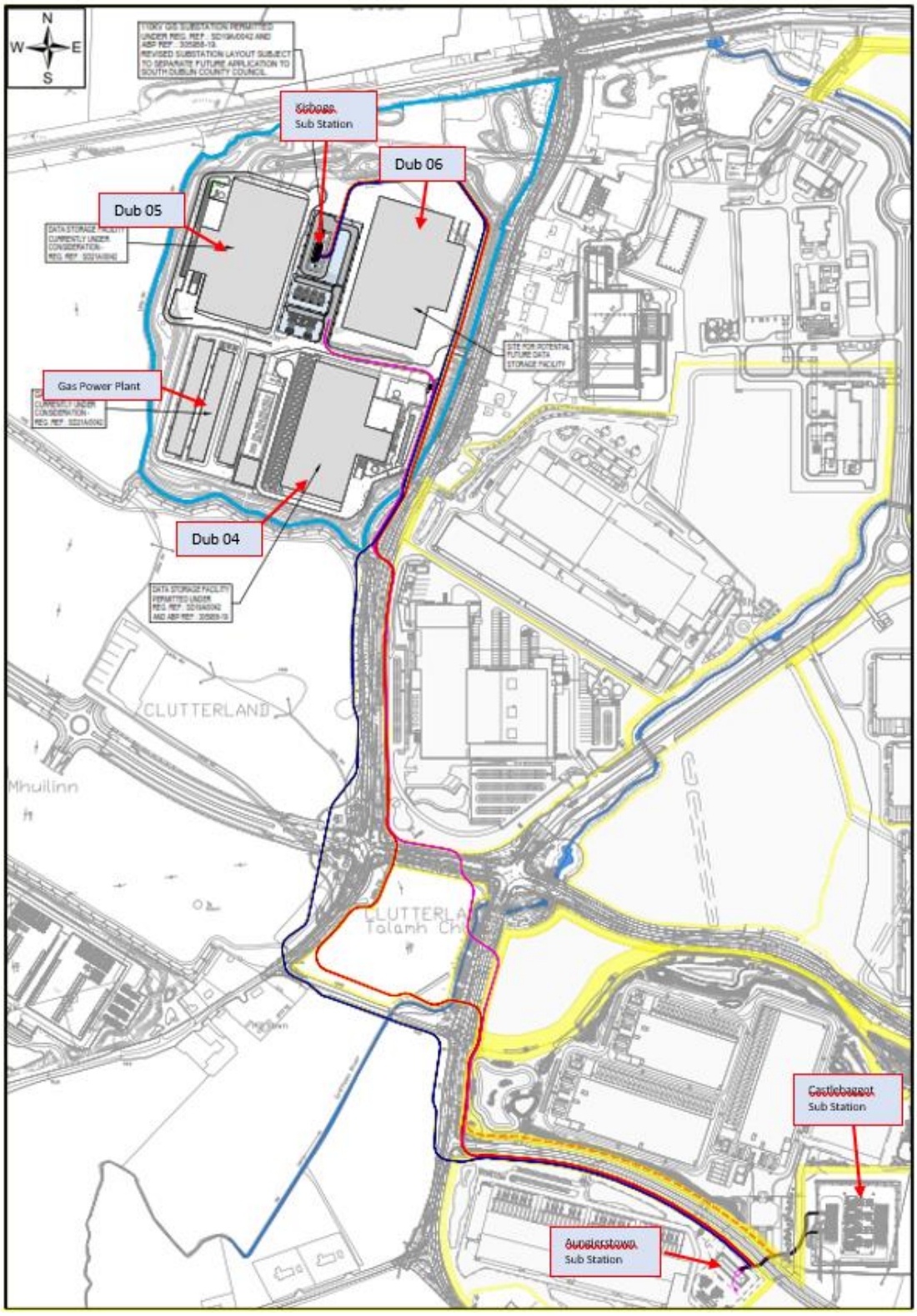
1. Duration of Effects
2. Quality of Effects
3. Significance of Effects

The assessment methodology for the preferred route selection involved a comparative evaluation of the identified route options taking account of a range of environmental criteria as listed in Table 3.3.

Environmental Criteria	
Human Health and Population: • Health Impacts; and • Economic Impact.	Land, Soils, Geology & Hydrogeology: • Geological Heritage; • Presence of contaminated land; • Economic reserve and land use; • Aquifer resource and impact on existing water supply; and • Aquifer vulnerability and water quality.
Water & Hydrology • Natural hydrological regime and water quality; • Flood risk; and • Water supply, wastewater and storm-water drainage.	Biodiversity • Potential impact on flora and fauna; • Potential impact on habitats of high ecological value; and • Potential impact on protected and designated habitats/sites.
Air Quality & Climate • No. of sensitive receptors potentially impacted; and • Nature and scale of construction activities.	Noise & Vibration • Potential impact of noise disturbance on sensitive receptors.
Landscape & Visual Impact • Landscape and visual effects	Archaeology, Architecture & Cultural Heritage • Archaeology, architecture and cultural heritage.
Material Assets & Waste Management • Ownership and Access; • Resource Consumption; • Soil Disposal; and • Waste Generated.	

Table 3.3 Environmental Criteria used to assess all the route options

In addition, a further qualitative comparative approach determined whether, in respect of the defined criteria, any particular route was *'More Preferred'* or *'Less Preferred'* or whether it had a considered neutral implication. In the case of some environmental factors, there is relevant guidance issued which may be applicable in determining the suitability of one route over the other. Guidance issued by Transport Infrastructure Ireland (TII) for assessment of particular effects on National Road Schemes is an example. Where appropriate, assessment methods from these guidance documents were used. The conclusion of each environmental factor assessed was expressed in terms of the EPA EIA Guideline descriptions and preference status.



Option 1 – Navy Blue, Option 2 – Pink, Option 3 – Red and Option 3A Orange

***Figure 3.1**: Alternative route options for the proposed underground transmission line.*

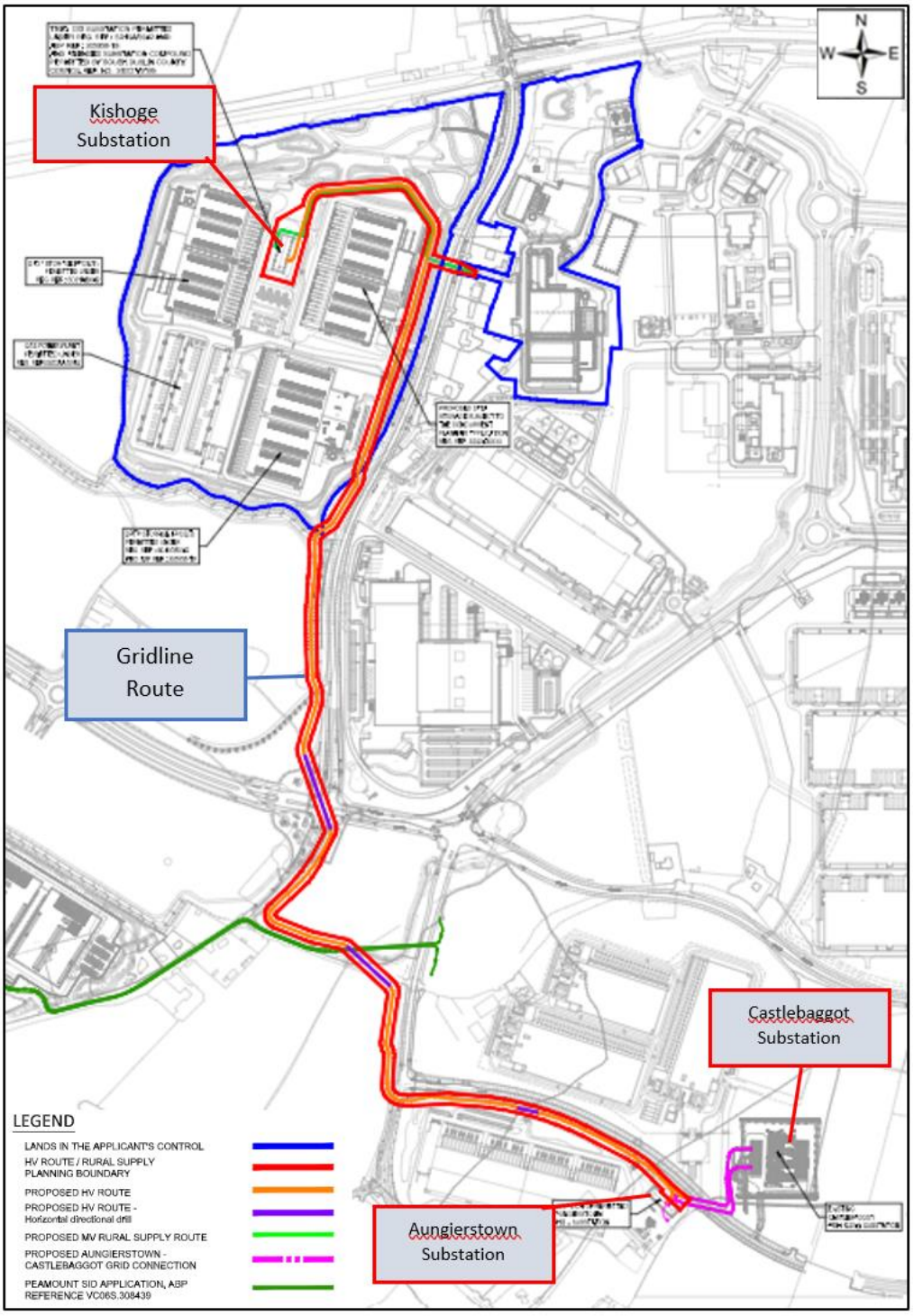


***Figure 3.2**: Shows Revised option 1 Gridline route (Extract from CSEA Proposed Overall Route PlanESSDUB98-CSE-01-XX-DR-C-2120)*

Option 1 – The initial proposed route shown in Figure 3.1 which has been modified to included 2 horizontal directional drills HDD's, the revised version of this route is described in Chapter 2 and presented above in Figure 3.2. Two single circuit underground transmission cables laid in parallel in a double circuit formation will proceed from the permitted Kishoge Substation in southerly direction to west of the R120. A HDD will be completed to install the cable under the New Nangor road and the Griffeen River, where it travels southerly prior to being culverted beneath the Baldonnell Road. The final section continues south-easterly along the southern boundary of the profile park road to the permitted Aungierstown – Castlebaggot underground 110kV transmission line.

The route is c. 2.2 Km in length, the majority of the route is off road with a section of the route potential impact traffic on the baldonnell Road. There will be two road crossings (HDD and open cut) and one river crossing under the River Griffeen (HDD).

Option 2 – Proposed Route presented above.
Two single circuit underground transmission cables laid in parallel in a double circuit formation will proceed from the permitted Kishoge Substation in southerly direction to west of the R120 to the southern boundary of the Edgeconnex site where it is culverted beneath R120 and continues in a Southerly direction along the eastern side of the R120. It will be culverted under the New Nangor Road and the Baldonnell Road, where it travels southerly along the eastern boundary of the Baldonnell Road prior to being culverted beneath the Profile Park Road at the western end of the Grangecastle Business Park. The final section continues southeaserly along the southern boundary of the profile park road to the permitted Aungierstown – Castlebaggot underground 110kV transmission line.

The route is C. 1.85 Km in length, the majority of the route is off road. There will be four road crossings and one river crossing (the River Griffeen) .

Option 3 – Proposed Route presented above.
Two single circuit underground transmission cables laid in parallel in a double circuit formation will proceed from the permitted Kishoge Substation in southerly direction to west of the R120 to the southern boundary of the Edgeconnex site where it is culverted beneath R120 and continues in a Southerly direction along the eastern side of the R120. It will be culverted under the New Nangor road (further west to option2) and the Baldonnell Road (further south to option 2), where it travels southerly along the eastern boundary of the Baldonnell Road prior to being culverted beneath the Profile Park Road at the western end of the Grangecastle Business Park. The final section continues southeaserly along the southern boundary of the profile park road to the permitted Aungierstown – Castlebaggot underground 110kV transmission line.

The route is C. 2.25 Km in length, the majority of the route is off road. There will be four road crossings and one river crossing (the River Griffeen).

Option 3A – Proposed Route presented above.
Two single circuit underground transmission cables laid in parallel in a double circuit formation will proceed from the permitted Kishoge Substation in southerly direction to west of the R120 to the southern boundary of the Edgeconnex site where it is culverted beneath R120 and continues in a Southerly direction along the eastern side of the R120. It will be culverted under the New Nangor road (further west to option2)

and the Baldonnell Road (further south to option 2), where it travels southerly along the eastern boundary of the Baldonnell Road. At the western end of the Grangecastle Business Park route continues southeaserly along the northern boundary of the profile park road to the permitted Aungierstown – Castlebaggot underground 110kV transmission line.

The route is C. 2.25 Km in length, the majority of the route is off road. There will be three road crossings and one river crossing (the River Griffeen).

A preliminary appraisal of the environmental effects of Options 1, 2, 3 and 3A was undertaken as part of the route selection process. All routes were determined as feasible with minimal temporary to short term impacts and no longterm impacts on the environment.

In terms of the operational phase for any of the route options, each of the environmental factors were considered to have a ***long-term***, ***neutral*** and ***imperceptible*** impact on the environment.

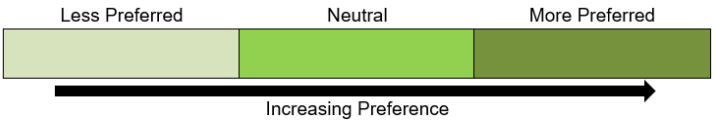
For the construction phase, the duration of impacts for all route options would be **temporary - *short term*** as the works for the transmission line will have a duration of less than 1 year (c. 42 weeks). There are no significant environmental effects predicted for the construction phase for the chosen route (option 1) as set out in the subsequent chapters of this EIA Report. Based on a high-level environmental assessment of all of the alternative routes, it is considered that the construction phase would not result in any significant environmental effects. However, the review highlighted the following issues which would require mitigation: 2, 3 and 3A.

- Option 2 and 3 required four road crossings with associated traffic impacts
- Option 3A requires three road crossings, however required the connection to the permitted transmission cable to be completed on the Northern side of Profile Park Road.
- Option 1 has the greatest length in greenfield. However, there are no areas of protection for biodiversity, landscape or cultural heritage identified which could not be easily mitigated.
- All options require a river crossing.

Each of the environmental factors were assessed for the construction phase using a similar methodology to determine the more preferred and less preferred route option, and in some cases there was no discernible difference between the four options and are considered neutral. The environmental factors are listed in Table 3.4 below with the conclusions of the preliminary assessment of each presented.

Table 3.4 *Summary of route preference for each environmental factor*

Environmental Factor	Option 1	Option 2	Option 3	Option 3A
Socio Economic – Human Beings				
Land soil geology & Hydrogeology				
Water & Hydrology				
Flora & Fauna				
Noise & Vibration				
Landscape & Visual Impact				

Archaeology & cultural Heritage				
Traffic & Transportation				
Material Assets & Waste management				
				

It is also noted that the above preferences were based on construction impacts only. Based on engineering assessment Option 1 was concluded as the preferred route due to volume of services within the existing roads and number of crossings and all other routes impacting exiting developed sites.

For the operational phase, it was determined that there would be a neutral preference for either route as the impacts are the same for each environmental factor (i.e. *long-term, neutral* and *imperceptible*).

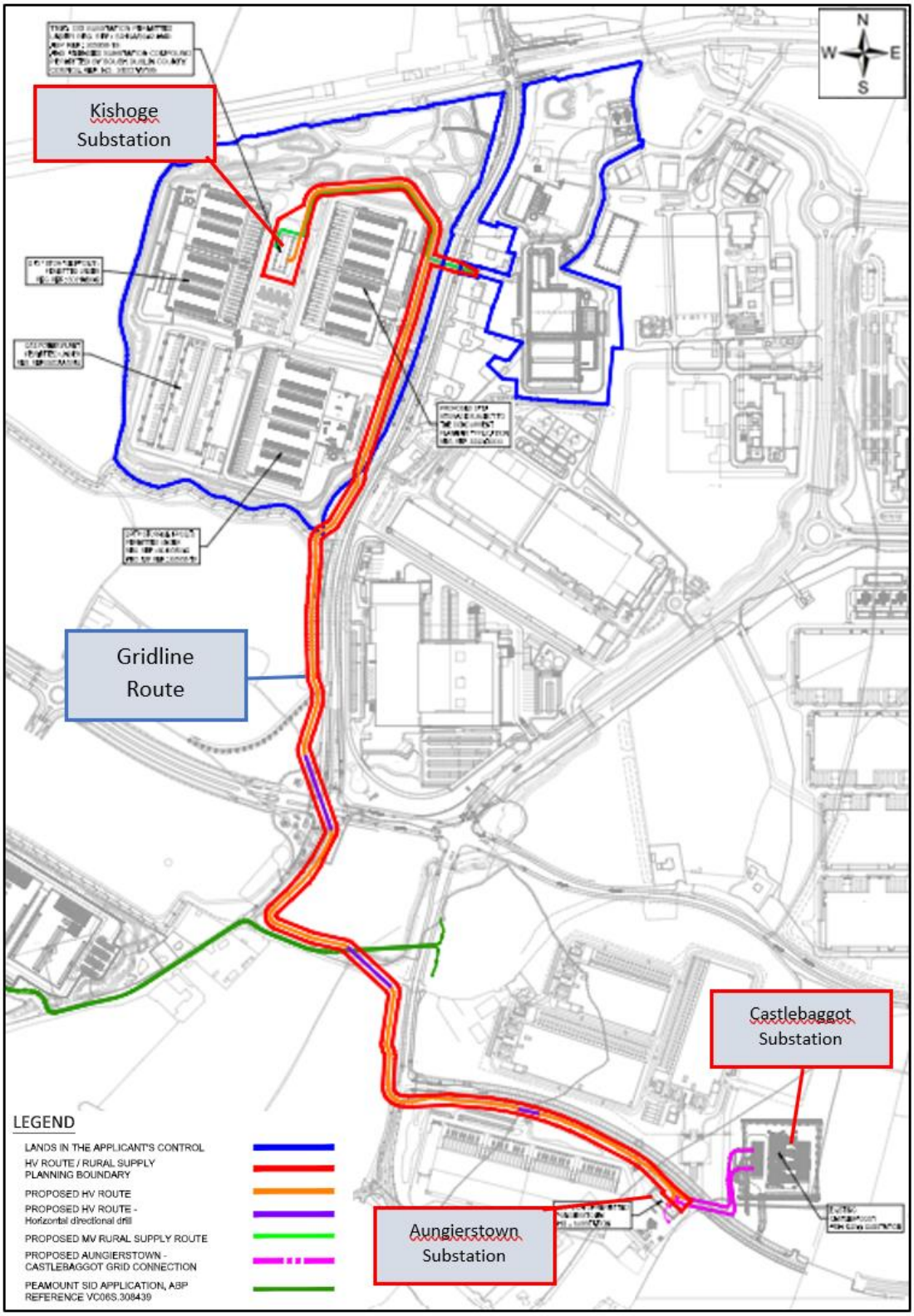


Figure 3.3: *Location of route option (extract from CSEA Proposed HV Overall Route Plan ESSDUB98-CSE-01-XX-DR-C-2120**)***

3.6.3 Alternative Design/Layouts

Alternative design options considered included an above ground transmission line. To minimise the visual impact of such a project, it was decided to design the project to deliver the required power supply below ground. This ensures the visual impact of the proposed project during the operational phase will be neutral and imperceptible.

3.6.4 Alternative Processes

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 transmission line will become an integral part of the national high voltage electricity grid which is currently operated by EirGrid. As such the transmission line must meet Eirgrid's strict specifications to ensure it will be seamlessly absorbed into the national grid infrastructure and can provide a reliable power supply to the Grange Castle area. From a "process design" point of view, therefore, the flexibility to select alternative processes for integrating into the current national grid isn't available to the applicant.

3.6.5 Alternative Mitigation

The mitigation measures proposed are outlined in each of the successive chapters and are similar to those applied to typical construction projects. These represent the best practice for achieving minimal impact on the receiving environment. Whilst alternatives were considered in the EIA process, the measures presented represent the best options for the site.

3.6.6 Conclusions on Alternatives

The selected route is the most suitable route for the proposed transmission line from an environmental and engineering perspective, taking land access into account. It is noted that all alternative proposed routes were considered to have a neutral, imperceptible, long-term effect during the operational phase. The final selection was therefore based on a comprehensive assessment of the 'most preferred' route (based on environmental and engineering criteria) expected to generate the least environmental effects during the construction phase with land access also being considered.

The design of the proposed underground transmission line has been selected with due regard to minimising the ecological and visual impact of the grid line once in situ. The selection of the process design has been constrained to the standard specifications required for connection to the national grid.

In conclusion, it is considered that the proposed transmission line route and design is the most suitable choice to provide the support required to meet current and future power requirements of the permitted data storage facility and the Grange Castle area.

4.0 POPULATION AND HUMAN HEALTH

4.1 INTRODUCTION

This chapter evaluates the impacts (direct and indirect significant effects) of the proposed transmission line on population and human health.

In accordance with the Draft EPA *Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (2022), this chapter has considered Employment, Human Health and Amenity with regard to the proposed transmission line.

Issues examined in this section include:

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

Where these topics are dealt with in further detail elsewhere in this EIA Report, the relevant chapters have been cross referenced in this chapter.

4.2 METHODOLOGY

The effects of the proposed development on the adjacent population and the health of that population are analysed in compliance with the previously referenced EPA guidelines (2022).

This assessment is conducted by reviewing the current population and employment status in the areas close to the proposed development. In the case of the proposed development, this is the Electoral Division (ED) of Newcastle (Area Code ED 03018), Clondalkin-Dunawley (ED) and Clondalkin Village (Area Code ED 03010). Reference is made to the most recent census data available from the Central Statistics Office (CSO) which is the 2016 census.

Identification of principal potential receptors and an analysis of impacts of the project on these receptors has been conducted. It is noted that no specific guidance on the meaning of the term ‘Human Health’ has been provided in the Directive 2014/52/EU (Directive on the Assessment of Public and Private Projects on the Environment). However, the European Commission’s Strategic Environmental Assessment (SEA) Directive (2001/42/EC) indicates that human health should be considered in the context of environmental pathways which may affect health such as air quality, noise, water and soil quality. All can contribute to negative effects on human health by facilitating the transport of contaminants or pollutants. An evaluation of the effects of these pathways on health, by considering the accepted standards of safety in dose, exposure or risk of

air quality and noise levels for example, is considered appropriate, as these standards have been arrived at via scientific and medical research[1].

4.3 RECEIVING ENVIRONMENT

The proposed development is described in chapter 2.

The potential human receptors within the environs of the proposed development include residential developments, e.g. Adamstown, Finnstown and the Griffeen Valley residential areas which are all located to the north of the site beyond the railway line. Also included are residential areas in Clondalkin to the east of the site. Other receptors include industrial and commercial businesses in the Grangecastle Business Park to the east for the gridline and substation.

4.3.1 Population and Employment

4.3.1.1 Population

The most recent population census was carried out by the Central Statistics Office (CSO) on 24th April 2016. The latest census data shows that the population in the South Dublin (LA) area grew by 5.1% between the years 2011 and 2016 compared with only 3.8% nationally. Newcastle (ED) and Clondalkin Village (ED) electoral divisions saw a higher population growth of 11.93% and 7.21% respectively in the same period, while Clondalkin-Dunawley (ED) saw a lower population growth of 4.1% (Table 4.1). There was a significant decrease in small area 267107005/01, a small decrease in small area 267053001 and an large increase in small area 267049001 inline with ED's.

Area	2011	2016	% Change 2011-2016
State	4,588,252	4,761,865	+3.8%
South Dublin (LA)	265,205	278,767	+ 5.11%
Clondalkin (LEA -8) 2014 boundary	Unavailable	55,641	
Newcastle (ED)	3,749	4,257	+11.93%
Clondalkin Village (ED)	8,492	9,152	+7.21%
Clondalkin-Dunawley (ED)	10,877	11,323	+ 4.1%
Small Area: 267107005/01	581	317	- 47%
Small Area: 267053001	270	257	- 4.8%
Small Area: 267049001	253	282	+ 11.16%

Table 4.1 Population change at national, Local Authority and Electoral Division level from 2011 – 2016 (*Source: www.cso.ie*)

[1] EPA (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Report – August 2022.

4.3.1.2 Employment

Table 4.2 presents the employment statistics in 2016 compared with 2011. The data shows that unemployment decreased significantly in both Electoral Division, Local Authority areas, as well as nationally, reflecting the economic recovery in recent years.

	At Work	Looking for first regular job	Unemployed having lost or given up previous job	Ratio of people at work to people unemployed/ looking for work
2011 Census Data				
State	1,807,360	34,166	390,677	4.3 : 1
South Dublin (LA)	106,534	2361	23,678	4 : 1
Clondalkin (LEA -8) 2014 boundary	Data unavailable on CSO Interactive Maps			
Newcastle (ED)	1748	16	204	7.9 : 1
Clondalkin Village (ED)	3742	59	776	4.4 : 1
Clondalkin-Dunawley (ED)	3808	134	1582	2.2 : 1
Small Area: 267107005/01	Data unavailable on CSO Interactive Maps			
Small Area: 267053001	Data unavailable on CSO Interactive Maps			
Small Area: 267049001	Data unavailable on CSO Interactive Maps			
2016 Census Data				
State	2,006,641	31,434	265,962	6.7 : 1
South Dublin (LA)	119,210	2,030	16,235	6.5 : 1
Clondalkin (LEA -8) 2014 boundary	23153	504	4288	4.3 : 1
Newcastle (ED)	1921	20	148	11.4 : 1
Clondalkin Village (ED)	4,289	44	494	7.9 : 1
Clondalkin-Dunawley (ED)	4,389	108	1039	3.8 : 1
Small Area: 267107005/01	65	0	15	4.3 : 1
Small Area: 267053001	122	0	10	12.2 : 1
Small Area: 267049001	129	1	34	3.6 : 1

Table 4.2 Employment statistics nationally, at Local Authority and Electoral Division level in 2011 and 2016 (*Source: www.cso.ie*)

4.3.2 Social Infrastructure

Residential Dwellings
The closest residential properties, Adamstown and Finnstown Cloisters, are located alongside the R120 C. 700 meters north of the Kishoge Substation, the Edconnecx site and the northernmost section of the gridline connection. There are residential properties beyond the R136 c. 170 meters to the east of the southeast section of the proposed gridline. The proposed gridline is primarily routed through an area of industrial properties which included Takeda Ireland Ltd. (Pharmaceutical), EdgeconneX (Data Centre), and Microsoft Ireland (Data Centre). The proposed route crosses the R120 C. 90 meters north of detached rural dwelling and adjacent to the Ascot Motor Company.

Sensitive receptors including schools and health care facilities within a 1-2 km area of the proposed transmission line are presented below.

Schools
There are a number of primary and secondary schools in the vicinity of the proposed gridline including:

- Adamstown Community College, Station Rd, Adamstown, Lucan, Co. Dublin. c. 800m to the northwest of the proposed substation.
- Adamstown Educate Together, Station Rd, Adamstown, Lucan, Co. Dublin. c. 800m to the northwest of the proposed substation.
- Lucan East Educate Together National School, Kishoge Cross, Griffeen Avenue, Lucan, Co. Dublin. c. 1.8km to the northeast of the proposed substation.
- Griffeen Valley Educate Together National School, Griffeen Glen Boulevard, Lucan, Co. Dublin. c. 2.0km to the northeast of the proposed substation.
- Lucan Community National School, Balgaddy, Lucan, Co. Dublin. c. 2.6km to the northeast of the proposed substation.
- Kishoge Community College, Thomas Omer Way, Lucan, Co. Dublin. c. 2.3km to the northeast of the proposed substation.
- Griffeen Community College, Ninth Lock Road, Lucan, Co. Dublin. c. 2.3km to the northeast of the proposed substation.
- Deansrath Community College, Westbourne Rise, Clondalkin, Dublin 22. c. 2.5km to the east of the proposed substation.
- Talbot Senior National School, Bawnogue, Clondalkin Dublin 22. c. 2.8km to the east of the proposed substation.

The closest third level institutions in the area are TU, Dublin, Tallaght main campus located c. 7.6km to the south-east, NUI Maynooth and St. Patrick's Maynooth located c. 14km to the north-west.

Health
The nearest hospital is Tallaght University Hospital located c. 6.8km from the substation and grindline. The Deanrath Health Centre is also located c. 2.5km east of the proposed route.

Security
There is a Garda station located in Clondalkin c. 4km east of the substation and gridroute. Tallaght is the nearest fire station located on the R113 (c. 5.5km to the south-east).

Shops

Londis Adamstown and Mizzzoni's Pizza situated in a small group of retail units in Adamstown are c. 700 meters north of the Substation. Maxol Services Station Adamstown and Goodwins Build and DIY are located c. 200 meters nother of the substation site. Finnstown shopping centre is located c. 1.5km north of the site on the R120. Lucan Shopping Centre is located further north along the R120 c. 2.0km. Centra Griffeen and Centra Foxborough are located to the c. 2.0km and 2.6km to the northeast respectively. There is 'Nearby' convenience store, a 'Daybreak' convenience store and Roma takeway 2.2km to the east of the proposed substation and gridline and adjacent to the Deanrath Health Centre.

4.3.4 Landscape, Amenity and Tourism

In terms of landscape amenity, the local landscape setting is generally flat with no prominent landscape features located near the site. The primary areas of landscape amenity in the immediate vicinity include the following recreational parks:

- Griffeen Valley Park (c. 1.0km to the northeast of the proposed substation);
- Tandy's Lane Park (c. 1.5km to the northwest of the proposed substation);
- Airlie Park (c. 1.8km to the northwest of the proposed substation);
- Corkagh Park (c. 3.0km to the southeast of the proposed substation and gridline);

Lucan Sarsfields GAA and Lucan Pitch and Putt are located immediately north of the proposed substation location c. 200 meters. There are further Lucan Sarsfields facilities located at St. Catherines Park c. 4km to the north. The park is a large public recreational amenity.

Tourism is not a major industry in the immediate environs of the site, however Finnstown Castle Hotels located c. 1.5km northwest of the proposed substation site and the Spa Hotel at Lucan (on the N4) c. 3km to the northwest offer accommodation and host events.

4.4 IMPACTS OF THE DEVELOPMENT

4.4.1 Impacts on Human Beings

It is not expected there will be any impact on local residential population figures in association with the construction of the proposed underground gridline connecting the two substations. At some point in the future there may be an impact in terms of increased available electricity supply, should it be required, to facilitate future potential industrial activities. In this context, it could have an imperceptible effect in terms of increased housing/accommodation demand for potential future workers who wish to locate in the area.

There will be a temporary, imperceptible, positive effect on local business with the limited presence of a very small number of construction workers using local facilities during the construction phase. However, the main potential impacts on human beings associated with the proposed gridline will be in temporary impact on 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. These are short term impacts.

4.4.2 Impacts on Human Health – Air Quality

As outlined in Chapter 8 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 8, Table 8.1). The standards for human health have designed to avoid harmful effects to health.

4.4.2.1 Construction Phase

As detailed in Chapter 8 Air Quality & Climate, best practice mitigation measures are proposed for the construction phase of the proposed project 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 project 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.

4.4.2.2 Operational Phase

Due to the nature of the proposed project, the effects on human beings during the Operational Phase are considered to be neutral.

4.4.3 Impacts on Human Health from Noise & Vibration

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

4.4.3.1 Construction Phase

As detailed in Chapter 9 Noise and 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. As a result, the existing noise environment is not expected to change significantly because of the temporary to 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 temporary to short-term construction phase.

4.4.3.2 Operational Phase

The proposed transmission cable will be underground and will not generate any perceptible levels of vibration or noise during operation and therefore there will be no impact from noise emissions or vibrations on human health.

4.4.4 Impacts on Local Amenities and Tourism

There will be no impact on the local parks or the larger amenity areas.

It is not anticipated that the transmission cable will have any impact on local tourism or shopping amenities.

The proposed transmission cable will not create any wastewater discharge which could have a potential impact on local amenities or the local population.

The underground nature 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 10 Landscape and Visual.

4.4.5 Impacts from Additional Traffic

An assessment of the additional construction traffic movements and temporary diversions associated with the proposed development during the construction phase is presented in Chapter 12 Traffic and Transportation.

The predicted impact of the development on human beings and in particular road users will be *temporary*, *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. There is no impact during operation.

4.4.6 Impacts on Health and Safety

The proposed underground transmission cable will be implemented in accordance with the Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005) as amended and the Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. 299 of 2007) as amended and associated regulations.

The proposed development has the potential for an impact on the health and safety of workers employed during the construction phase. The activities of the applicant's 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) to minimise the likelihood of any impacts on workers' health and safety.

The 2014 EIA Directive and associated Draft EPA EIA Guidelines require that the vulnerability of the project to major accidents and/or natural disasters (such as earthquakes, landslides, flooding, sea level rise etc.) is considered in the EIA Report.

The site has been assessed in relation to the following external natural disasters; landslides, seismic activity, volcanic activity and sea level rise/flooding as outlined below. The potential for major accidents to occur at the facility has also been considered with reference to Seveso/Control of Major Accident Hazards (COMAH) Regulations.

There is a negligible risk of landslides occurring at the site and in the immediate vicinity due to the topography and soil profile of the site and surrounding areas. There is no history of seismic activity in the vicinity of the site. There are no active volcanoes in Ireland so there is no risk of volcanic activity.

The potential risk of flooding on the site was also assessed. A Stage 1 Flood Risk Assessment was carried out and it was concluded that the development is not at risk of flooding. Furthermore, the proposed development design has no potential impact on flood risk for other neighbouring properties.

There is little potential impact on the receiving environment as a result of minor accidents/leaks of fuel/oils during the construction phase as no bulk fuel storage required. However, the implementation of mitigation measures for management of localised construction equipment leaks set out in the EIA Report will ensure the risk of a minor/accident is low and that the residual effect on the environment is imperceptible.

Once operational the underground transmission cable will form part of ESB Networks' infrastructure. ESB Networks are the licensed operators of the electricity distribution system in the Republic of Ireland. ESB Networks is responsible for building, operating, maintaining and developing the electricity network and serving all electricity customers across the country. Eirgrid is a state-owned body responsible for operating the flow of power on the grid. Both bodies are experienced in the management and operation of the national electricity grid, with appropriate environmental, health and safety management systems in place.

4.5 REMEDIAL AND MITIGATION MEASURES

The impacts on the local population are considered to be temporary, positive and imperceptible due to the expected temporary 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 availability of the transmission cable installation will support current power demand of the EdgeConnex data center and future growth of industry within the Grangcastle Business Park area which will support employment in the area.

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 8 and 9, respectively.

Chapter 12 Traffic and Transportation addresses mitigation measures proposed to reduce the effect of traffic management during construction.

4.6 CUMULATIVE IMPACTS

During operation, there is no potential for cumulative impact with the proposed project and the projects outlined in Chapter 3 as there is no impacts on air quality, noise, traffic or landscape post construction.

During construction, there is potential for cumulative impact with developments outlined in Table 2.1 and Chapter 3 in terms of air quality, noise, traffic or landscape. These have been addressed in each of the relevant chapters 8, 9, 12 and 11 respectively. The cumulative impact is concluded as ***longterm and imperceptible*** with regard to human health and population.

4.7 RESIDUAL IMPACTS

It is expected that the proposed transmission cable development will have a positive and long-term effect on the immediate hinterland through facilitating the provision of adequate electricity supply that could potentially facilitate in turn future employment opportunities.

There are no predicted adverse residual effects primarily due to the development being underground.

A health and safety management plan will be place to ensure the health and safety of all site personnel during construction. The experience of ESB Networks and the systems in place as outlined in the same section will minimise any health and safety risks during operation of the transmission line.

Interactions are addressed in Chapter 15 of this EIA Report. Cumulative impacts are address in each Chapter this EIA Report.

4.8 MONITORING/ REINSTATEMENT

Not applicable. No monitoring for human health, or reinstatement measures are proposed or required during the construction and operational phase of development.

References

Central Statistics Office. Statbank Databases (Accessed January 2022, https://www.cso.ie/en/databases/)
Central Statistics Office. Census of Population, 2011 and 2016. (Accessed January 2022, https://www.cso.ie/en/census/)
Central Statistics Office. Labour Force Survey, 2020 (Accessed January 2022, www.cso.ie/en/statistics/labourmarket/labourforcesurveylfs)
Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC, Directive 2012/18/EU)

5.0 LAND, SOILS, GEOLOGY AND HYDROGEOLOGY

5.1 INTRODUCTION

This chapter assesses and evaluates the potential impacts of the proposed development on the land, soil, geological and hydrogeological aspects of the proposed development site and the surrounding area. In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely environmental effects.

5.2 METHODOLOGY

5.2.1 Criteria for rating of effects

This chapter evaluates the effects, if any, which the proposed development will have on Land, Soils, Geology and Hydrogeology as defined in the Environmental Protection Agency (EPA) '*Guidelines on the Information to be contained in Environmental Impact Assessment Reports'* (EPA, 2022) as well as in line with Article 94 and Schedule 6 of the Planning and Development Regulations 2001 (as amended) and Article 5 and Annex IV of the EIA Directive (2011/92/EU, as amended). The Draft EPA document entitled '*Advice Notes for Preparing Environmental Impact Statements'* (EPA, 2015) is also followed in this geological and hydrogeological assessment and classification of environmental effects. Due consideration is also given to the guidelines provided by the Institute of Geologists of Ireland (IGI) in the document entitled '*Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'* (IGI 2013). Finally, the document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the Transport Infrastructure Ireland (TII) formerly National Roads Authority (NRA) (TII, 2009) is referenced where the methodology for assessment of impact is appropriate.

The rating of potential environmental effects on the land, soil, geological and hydrogeological environment is based on the standard EIAR impact predictions table included in Chapter 1 which takes account of the quality, significance, duration and type of effect characteristic identified (in accordance with impact assessment criteria provided in the EPA Guidelines (2022) publication).

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.

The TII (2009) criteria for rating the magnitude and significance of impacts on the geological 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 Tables 1-5 in Appendix 5.1.

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

- Geological heritage sites within the vicinity of/ within the perimeter of the proposed development site;
- Landfills, industrial sites in the vicinity of the site and the potential risk of encountering contaminated ground;
- The quality, drainage characteristics and range of agricultural use(s) of subsoil around the site;
- Quarries or mines in the vicinity and 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 any requirement to remove it off-site as waste for disposal (D) or recovery (R) options;
- High-yielding water supply wells/ springs in the vicinity of/ within the site boundary to within a 2 km radius and the potential for increased risk presented by the proposed development;
- Classification (regionally important, locally important etc.) and extent of aquifers underlying the site boundary area;
- Increased risks presented to the groundwater bodies by the proposed development associated with aspects such as, for example, the removal of subsoil cover, removal of aquifer (in whole or part thereof), spatial drawdown in water levels, alteration in established flow regimes, and changes in local/ regional groundwater quality;
- Natural hydrogeological/ karst features in the area and potential for increased risk presented by the activities at the site; and
- Groundwater-fed ecosystems and the increased risk presented by operations both spatially and temporally.

5.2.2 Sources of Information

Desk-based geological information on the substrata (both Quaternary deposits and bedrock geology) underlying the extent of the site was obtained through accessing databases and other public archives where available. Data was sourced from the following:

- Geological Survey of Ireland (GSI) - on-line 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; and
- South Dublin County Council (SDCC) - illegal landfill information.

Site-specific data was derived from the following sources:

- Marston Planning Consultancy (2021) Environmental Impact Assessment Report Aungierstown Substation and transmission lines Grange Castle South Business Park
- Various design site plans and drawings; and
- Consultation with site engineers/ planners/ architects.

5.2.3 Forecasting Issues or Difficulties Encountered

There were no difficulties encountered in compiling this chapter of the EIAR.

5.3 RECEIVING ENVIRONMENT

The receiving environment is discussed in terms of land geology, soils, hydrogeology and site history including potential for existing and historical contamination.

5.3.1 General Description of the Site

5.3.1.1 Site Setting

The proposed development is to be located in the Grange Castle Business Park, Clondalkin, Dublin 22. This land is zoned for development. Much of the lands to the east have been developed as part of the wider Business Park development with green fields to the south and west. Further green fields and Lucan Sarsfields GAA club are located to the north. The site location map for the proposed development is presented in presented in Figure 5.1 below.

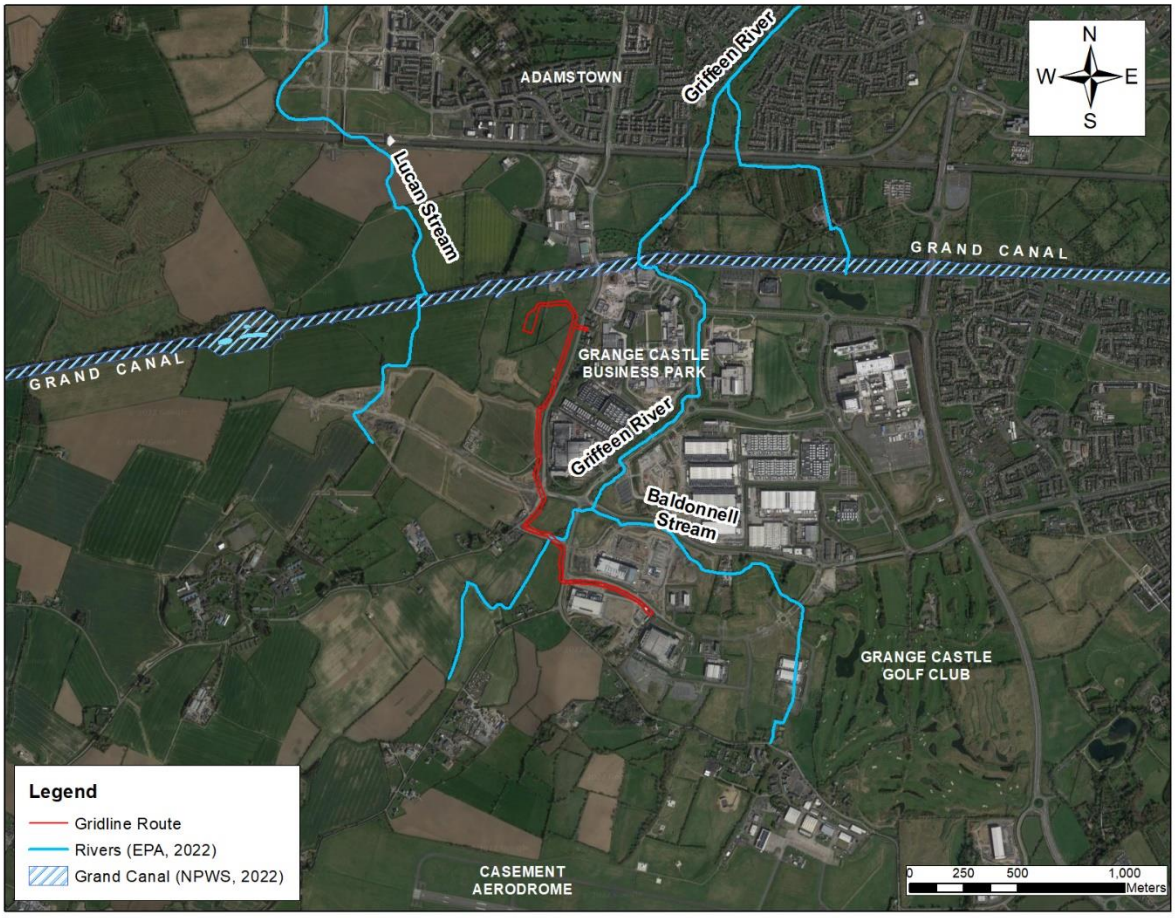


Figure 5.1 Site Location with site layout (AWN, 2022)

5.3.1.2 Topography and Setting

The proposed 110kV underground transmission line connections will originate from the Kishoge 110kV GIS substation. The substation was permitted as part of the development under Reg. Ref.: SD19A/0042 and ABP Ref.: 305948-19 and is subject to a separate current amendment application under Reg. Ref.: SD22A/0105. The proposed 110kV underground transmission line connections extend northwards from the Kishoge 110kV substation, before proceeding to the east and then to the south, along the periphery of the lands in the ownership of the applicant and continuing

alongside the R120 before cross the R134 New Nangor Road. The route then proceeds southeast towards the Griffeen River and proceeding eastwards and then south before crossing the Baldonnel Road and proceeding eastward within lands to the south of the Grange Castle South Business Park access road, before reaching and connecting to the Aungierstown – Castlebaggot underground transmission line. The Kishoge to Aungierstown transmission line circuit will include 4 no. joint bays, while the Kishoge to Castlebaggot transmission line circuit will include 5 no. joint bays. The proposed 110kV underground transmission line connections will cover a distance of c. 2.2 kilometres.

The development includes enabling works, services diversions, joint bays, connections to the Kishoge substation and the Aungierstgown – Castlebaggot transmission line, provision of a medium voltage electricity connection to serve the Kishoge substation from an existing ESB substation to the east of the R120, landscaping, services, all associated construction works, and all ancillary works

The gradient of the gridline route runs south to north at 75 metres above ordinance datum (mAOD) at the Kishoge substation to 65 mAOD at the greenfield site west of the current Edgeconnex site.

An assessment of site history using historical maps (OSI, 2021) indicates that the wider Grange Castle Business Park Site has been in agricultural use since the earliest mapping available (1837-1842) until its recent development as a technology and business park.

5.3.1.3 Areas of Geological Interest and Land Use

The Geological Survey of Ireland (GSI) Public Viewer www.gsi.ie/mapping was reviewed to identify sites of geological heritage for the site and surrounding area. There are no recorded sites on the development site. A full audit has not yet been completed for Dublin; 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 2022-2028. The closest geological heritage site is the Belgard Quarry, which is located 3 km to the south-east of the site. Due to the distance and the compact nature of the Calp limestone beneath the proposed Site, there is a negligible risk to this heritage site.

Details of the Site history and previous land use are included in Chapter 11 - Archaeology & Cultural Heritage. The assessment of site history confirms that until recently, the site has been in agricultural use since the earliest mapping available (1837 – 1842).

According to the EPA (2022), there are a number of licensed Integrated Pollution Prevention and Control (IPPC) and waste facilities in the vicinity, but these are located c. 3 km away from the site. Consultation with South Dublin County Council confirmed that there are no known illegal/historic landfills within 500 meters of the site.

The current land use is greenfield and public roadway. The land is currently zoned EE for development.

5.3.2 Soils

The Teagasc soil mapping indicates that the soils are comprised primarily of deep well drained mineral soil derived from limestones (BminDW) with areas of Poorly drained mineral soils derived from mainly basic parent materials (BminPD). The EPA (via

Corine Land Cover 2018 maps) have mapped the land use cover of the eastern area of the Business Park as primarily industrial with agricultural land to the south and west.

Figure ***5.2*** below presents the soils map indicating the soil lithologies discussed above.

Figure 5.2 Soils Map with the proposed site layout (Source: EPA/ Teagasc, 2022)

5.3.3 Subsoils

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.

The GSI/ Teagasc mapping database of the subsoils in the area of the proposed development site indicates one (1) no. principal soil type, as shown in Figure 5.3 below. The subsoil types present across the site are:

- LIMESTONE till Carboniferous (TLs). A large section of the eastern boundary of the site is composed of limestone TILL. This till is made up of glacial CLAYs which are less permeable than alluvium subsoils.

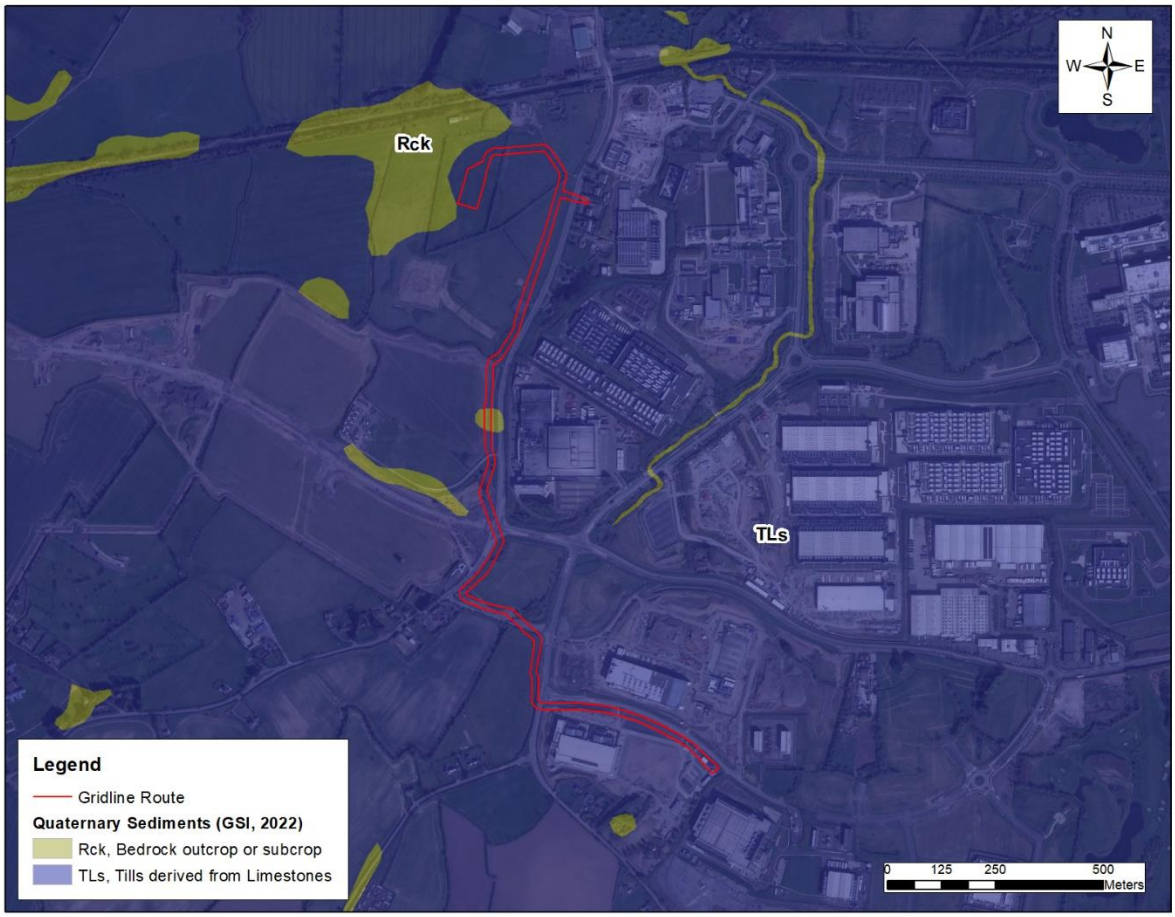


Figure 5.3 Subsoils Map with the proposed site layout (Source: GSI, 2022)

5.3.4 Bedrock Geology

Reference to the GSI Bedrock Geology Map show that the bedrock geology underlying the site and surrounding area is dominated by rocks of Carboniferous Age. The site and local area is underlain by the Lucan formation, also called the Dinantian (Upper Impure) Limestones or 'Calp' limestone that is dark grey to black limestone and shale. The Bedrock Geology Map is shown in Figure 5.4, below.

Figure 5.4 Bedrock Geology Map with the proposed site layout (Source: GSI, 2022)

5.3.5 Regional Hydrogeology

The GSI classifies the principal aquifer types as:

Bedrock Aquifer

- Lk - Locally Important Aquifer - Karstified.
- Ll - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones.
- Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive. Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones.
- Pu - Poor Aquifer - Bedrock which is Generally Unproductive.
- Rkd - Regionally Important Aquifer (karstified diffuse).

Gravel Aquifer

- Lg - Locally Important Aquifer - Sand & Gravel.
- Rg - Regionally Important Aquifer - Sand & Gravel.

Reference to the GSI National Draft Bedrock Aquifer Map for the Site (refer to Figure 5.5, below) indicates that the site is underlain by a Locally Important Bedrock Aquifer (LI), which is described by the GSI as bedrock as being “moderately productive only in local zones

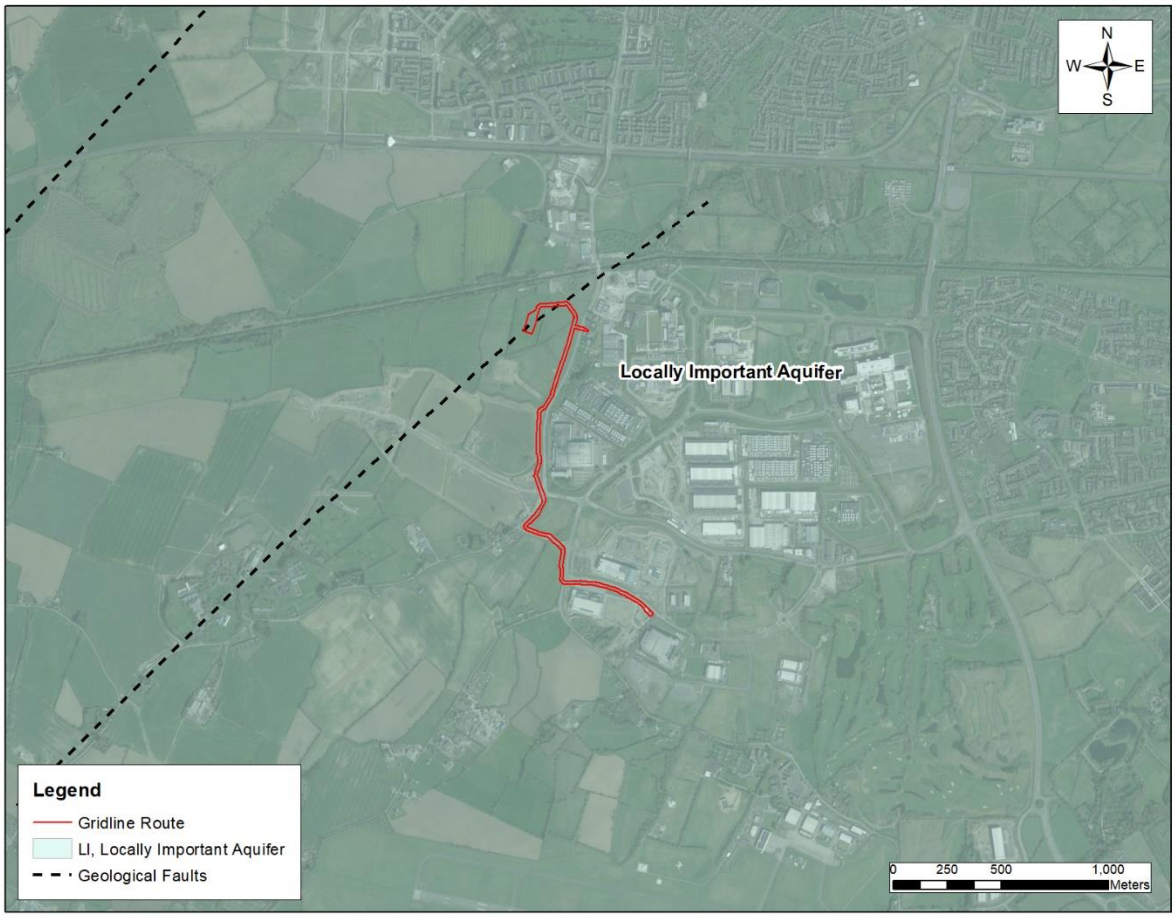


Figure 5.5 Aquifer Classification Map with the proposed site layout (Source: GSI, 2022)

5.3.6 Aquifer Vulnerability

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 solely of or of mixtures of peat, sand, gravel, glacial till, clays or silts).

The GSI currently classifies the aquifer vulnerability in the region of the Proposed Development as primarily 'Extreme' (E) and 'High' (H) to the east of the site. Extreme vulnerability indicates an overburden depth of 0-3 m is present, while High vulnerability indicates an overburden depth of 3-5 m is present. Various site investigations to the south of Grange Castle Business Park confirmed that presence of limestone bedrock was found at depths that were typically in the range 2.0 to 2.6 mbgl (Marston, 2021). The aquifer vulnerability class in the region of the site is presented below as Figure 5.6.

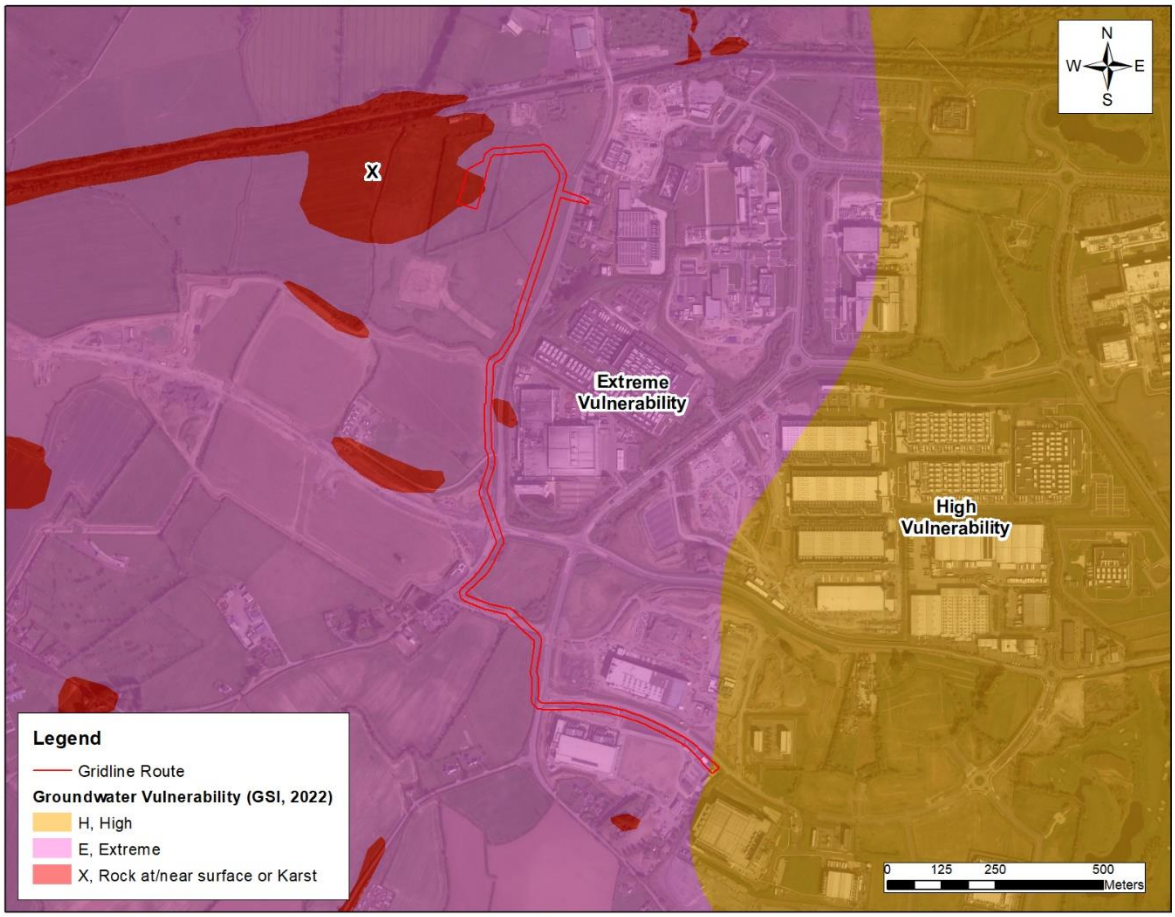


Figure 5.6 Aquifer Vulnerability Map with the proposed site layout (Source: GSI, 2022)

Table 5.1 below presents the GSI vulnerability mapping guidelines with specific reference to subsoil thickness and characteristics.

Table 5.1 *Vulnerability Mapping Guidelines (Source: GSI, 2022)*

Vulnerability Rating	Hydrogeological Condition				
	Subsoil Permeability (type) and Thickness			Unsaturated Zone	Karst Features
	High Permeability (sand/gravel)	Moderate Permeability (e.g. sandy subsoil)	Low Permeability (e.g. clayey subsoil, clay, peat)	(Sand/ gravel aquifers only)	(<30 m radius)
Extreme (E)	0 - 3 m	0 - 3 m	0 - 3 m	0 - 3 m	-
High (H)	> 3 m	3 - 10 m	3 - 5 m	> 3 m	n/a
Moderate (M)	n/a	> 10 m	5 - 10 m	n/a	n/a
Low (L)	n/a	n/a	> 10 m	n/a	n/a

Notes: (1) n/a: Not applicable

(2) Precise permeability values cannot be given at present

(3) Release point of contaminants is assumed to be 1-2 below ground surface

5.3.7 Description of the Groundwater Body

The Water Framework Directive (WFD) Directive 2000/60/EC was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater and transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of 'Good Status' in waterbodies that are of lesser status at present and retaining 'Good Status' or better where such status exists at present. The EPA co-ordinates the activities of the River Basin Districts (ERBDs), Local Authorities and State agencies in implementing the WFD, and operates a groundwater quality monitoring programme undertaking surveys and studies across the Republic of Ireland (ROI).

Presently, the groundwater body in the region of the site (Dublin GWB) is classified under review as per the WFD Risk Score system . The Dublin GWB achieved 'Good Status' in the period 2013 – 2018.

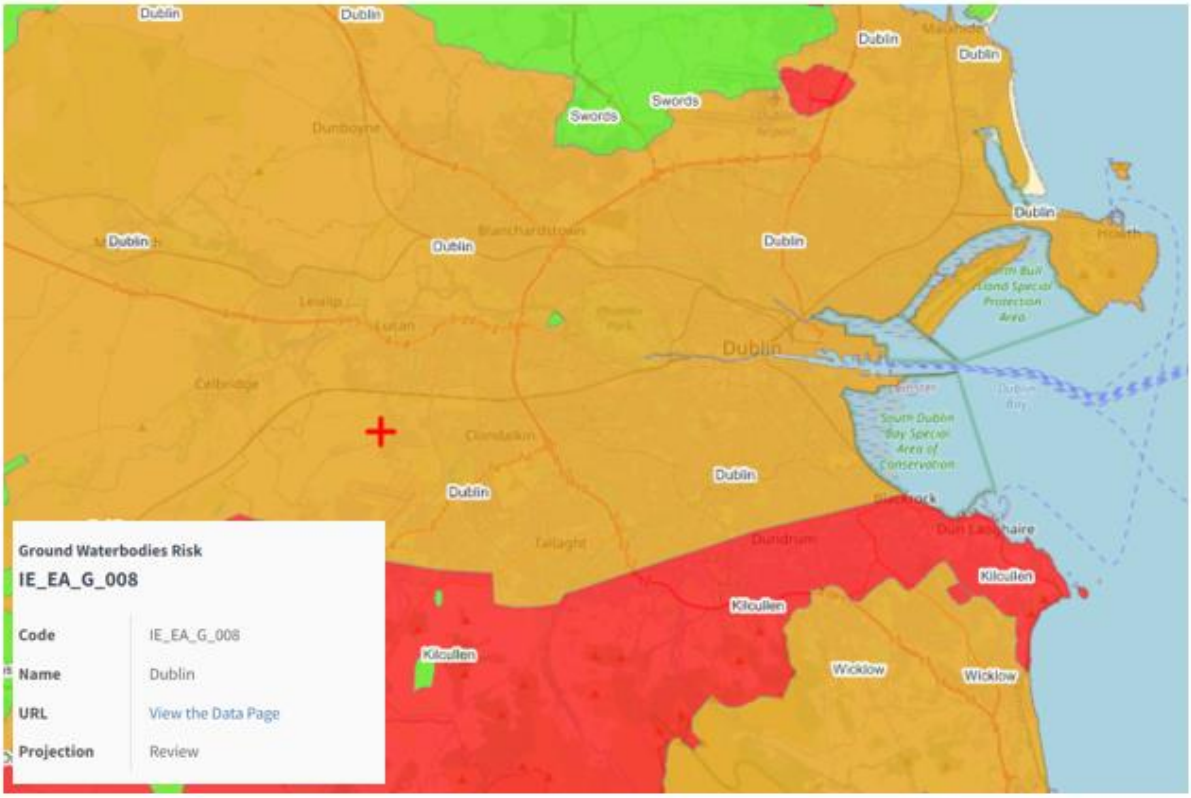


Figure 5.7 Groundwater Body Map (Source: EPA, 2022). Gridline location shown with red cross.

5.3.8 Groundwater Wells and Flow Direction

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 with the nearest 9.912 km to the south (KIlteel GWS Co. Kildare). There are no groundwater source protection zones in the immediate vicinity of the site.

The flow direction in the overburden generally follows no fixed pattern or trend. Flows of this nature are typical of low permeability clay strata with discontinuous gravel lenses, where often the water level measures represent pore water seepages into the overburden monitoring well (opposed to bedrock wells) or perched groundwater conditions (not bedrock aquifer water). Regional groundwater flow would be assumed to be to the east towards Dublin Bay.

There is no risk to any public water supply as the nearest drinking water protection area is located 9.2 km south of the site in Co. Kildare at Kilteel.

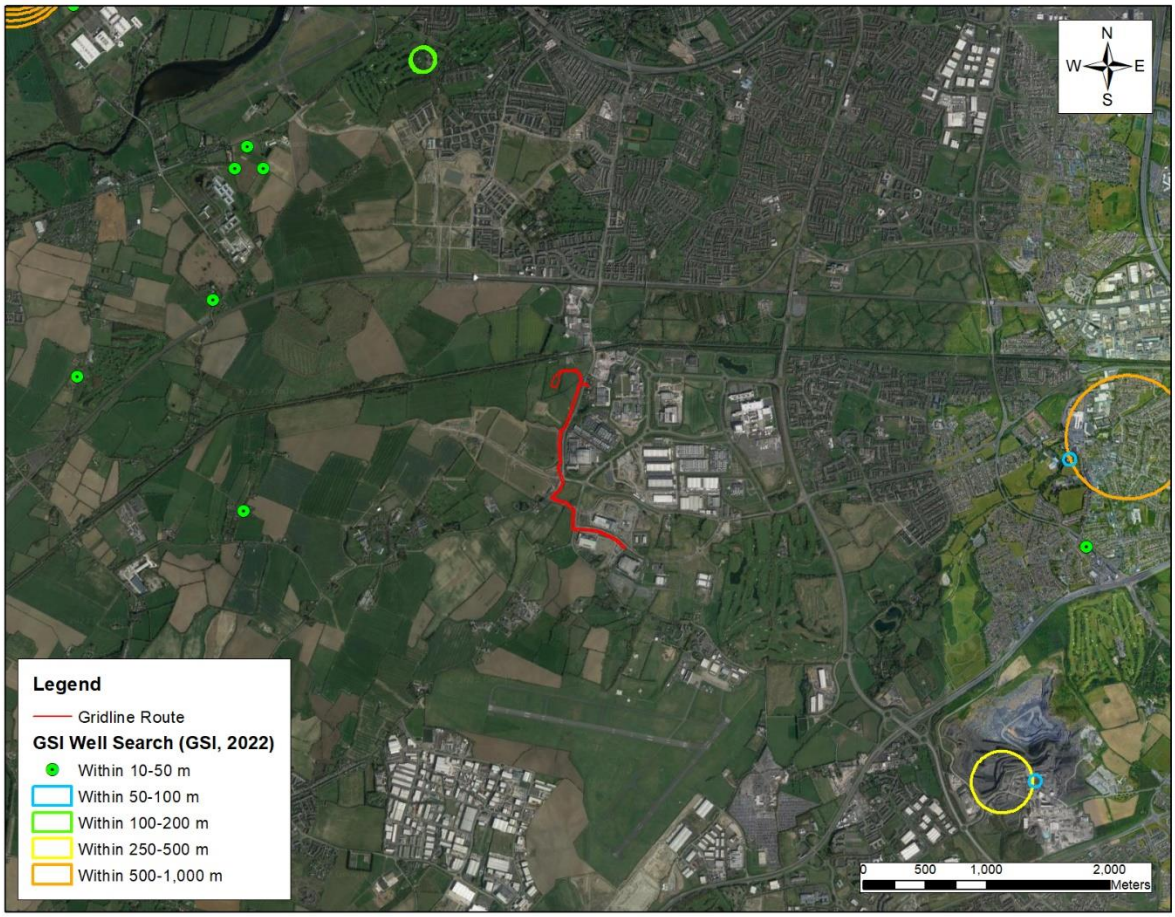


Figure 5.8 GSI Well Search Map (Source: GSI, 2022)

Table 5.2 below summarises the details of wells recorded within this search area.

Table 5.2 *GSI Well Table Index (Source: GSI, 2021)*

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 Common	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		

5.3.9 Hydrogeological Features

There is no evidence of karstification at the vicinity of the Site according to the GSI Karst and well database. The nearest being located in Leixlip Co. Kildare (St Collumbs Well) 6.0 km to the north of the proposed grid line route.

5.3.10 Areas of Conservation

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. There is no direct hydrogeological link with the canal. Refer to Chapter 6 - Biodiversity of this EIA Report, , for further details.

5.3.11 Conceptual Site Model

A local cross section of the proposed gridline route is presented below in Figure 5.9 (A-A' south-west to south-east) and a regional cross section is presented in Figure 5.10 (B-B' west to east). These cross sections and the description below present the Conceptual Site Model (CSM). The CSM was developed in order to identify any likely Source-Pathway-Receptor linkages relating to the site and the proposed development.

- The gradient of the gridline route runs south to north at 75 metres above ordinance datum (mAOD) at the Kishoge substation to 65 mAOD at the greenfield site west of the Edgeconnex site.
- Various site investigations to the south of Grange Castle Business Park confirmed that presence of limestone bedrock was found at depths that were typically in the range 2.0 to 2.6 mbgl (Marston, 2021). Further north bedrock depths are generally between c. 2 and 3 m BGL, with the overlying soil primarily comprised firm to stiff, brown or grey sandy gravelly clays. The proposed gridline will have been constructed to NRA specifications.
- The underlying aquifer is a Locally Important (Ll) aquifer with no evidence of karstification.
- From investigations in the area (Marston, 2021) there is no evidence of a continuous water table within the clayey soil and shallow water was encountered within the weathered surface of the limestone bedrock.
- 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.
- Regional groundwater flows are in an easterly direction, towards Dublin Bay; 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. The proposed project is outside of any delineated drinking water protection area. There are a number of domestic / agricultural wells in the surrounding lands.
- There are no groundwater dependent terrestrial ecosystems which have potential to be impacted by the proposed Project. The Baldoyle SAC does include an area of saltwater marsh to the east of the Site (c. 400 m). This is addressed in Chapter 10 (Hydrology) and Chapter 8 (Biodiversity).

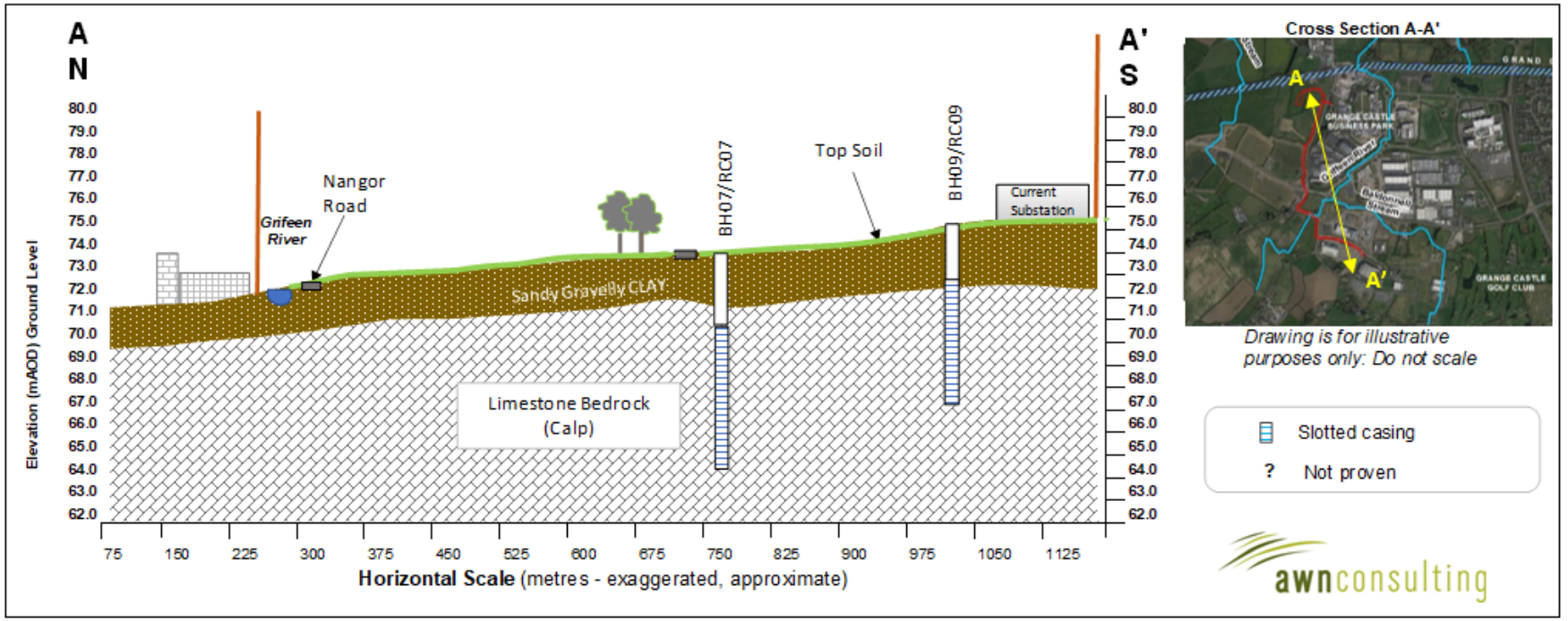


Figure 5.9 Site Conceptual Model, local cross section of the Site (A-A' North to South). (Borehole information taken from Marston 2021)

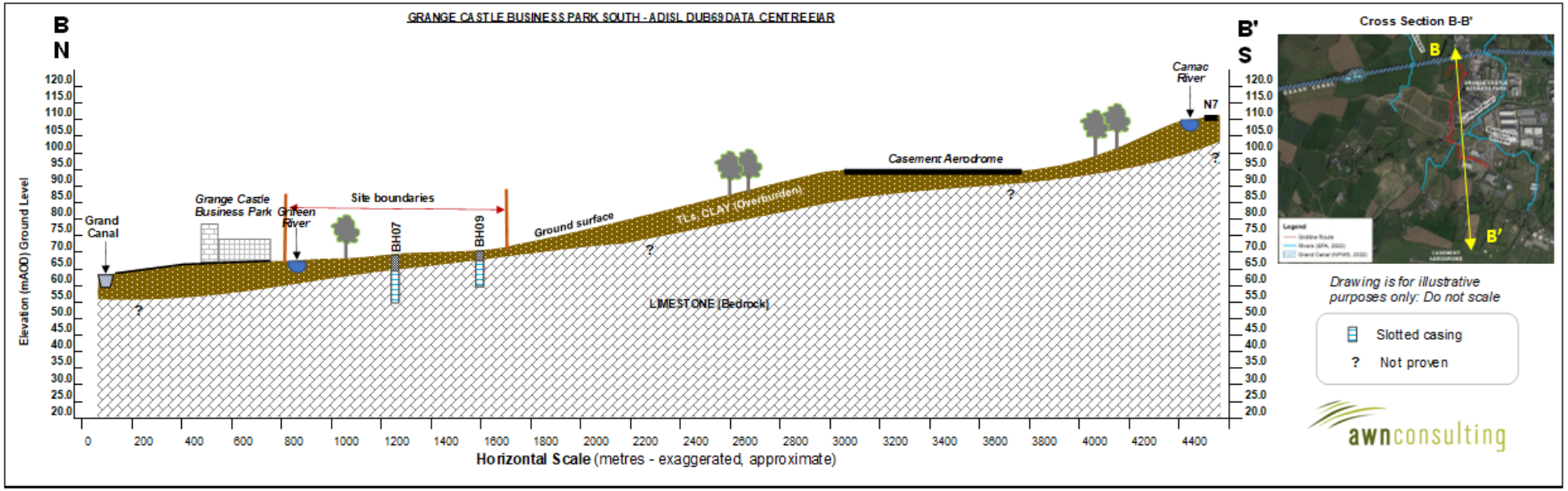


Figure 5.10 Site Conceptual Model, regional cross section (B-B' north to south). (Borehole information taken from Marston 2021)

5.3.12 Economic Geology

The Extractive Industry Register (www.epa.ie) and the GSI mineral database was consulted to determine whether there were any mineral sites close to the Proposed Development. There are no active quarries located in the immediate with the nearest quarry is located c. 3 km to the southeast which is classified as the Belgard Quarry. The EPA ENVision website also confirmed that there are no mines on or near the site.

5.3.13 Radon

According to the EPA (now incorporating the Radiological Protection Institute of Ireland) the site location in Cruiserath is a Low Radon Area where is it estimated that between 5% - 10% of dwellings will exceed the Reference Level of 200Bq/m3. This is the third lowest of the five radon categories which are assessed by the EPA

5.3.14 Geohazards

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 the slope failure. Instability is often significantly increased by human activities, e.g., construction, agricultural activities, etc. Mass movements / mass wasting (such as landslides, mud flows, bog bursts 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, landslides and falls lead 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 there are no recorded landslides in the vicinity of the proposed Project. Due to the local topography and the underlying strata, there is a negligible risk of a landslide event occurring at the Site.

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, 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 Site of the proposed Project 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 at the Site.

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

5.3.15 Rating of Importance of Geological and Hydrogeological Attributes

Based on the NRA methodology (refer Appendix 5.1), the criteria for rating site importance of hydrogeological features, the importance of the hydrogeological features at this site is rated as medium importance. This is based on the assessment that the 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

5.3.16 Summary & Type of Geological/ Hydrological Environment

Based on the regional and site-specific information available the type of geological / hydrogeological environment at the Site, as per the IGI Guidelines, is:

Type B - Naturally Dynamic Hydrogeological Environment

- The Proposed Development site has been greenfield/agricultural use historically. There is no evidence of any historical waste disposal or source of contamination.
- The study area is underlain by a locally important aquifer; and
- The study area is underlain by the Lucan formation comprising dark grey to black limestone and shale from the Carboniferous Age.

5.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The activities associated with the proposed Project which are relevant to the land, soils, geology and hydrogeological environment are detailed in Table 5.3.

Table 5.3 *Summary of site activities*

Phase	Activity	Description
Construction	Discharge to Ground	Run-off percolating to ground at the construction site.
	Earthworks: Excavation of Superficial Deposits	Shallow cut and fill will be required to facilitate construction of the 110 kV transmission line. The installation of the transmission line will require the excavation of one trench along the route containing two 110 kV circuits. The optimum depth of excavation of the trenches required to facilitate installation of the ducting will typically be 1.38 m below ground level but may increase at utility crossings. The typical width of each trench is 1.50 m; however, this may vary depending on ground conditions and existing services. Subsoil stripping and localised stockpiling of soil will be required during construction. It is estimated that approximately 7,000 m^3 of soils will be excavated to facilitate construction of the Proposed Development. It is currently envisaged that majority of the excavated material will require removal offsite. In addition, a horizontal directional drill (HDD) will be carried out for the crossing of the Griffeen river to the south of the gridline route.
	Storage of hazardous Material	No bulk fuel storage during construction phase. Fuel storage on permitted contractor compound at EdgeConnex.
	Import/Export of Materials	It is currently envisaged that majority of the excavated material will require removal offsite. Material removed from site may be 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) as amended or will be reused, recovered and/or disposed off-site at appropriately authorised waste facilities. The removal of waste from the site will be carried out in accordance with Waste Regulations, Regional Waste Plan (Eastern Midland Region) and Waste Hierarchy/Circular Economy Principals. Refer to Chapter 14 Waste Management for further detail. It is estimated that 7,000 m^3 of clean engineered fill material will be required to facilitate construction of the Proposed Development.

Phase	Activity	Description
O p	Increase in hard standing area	Altering of local recharge due to increase in hard standing area.

As outlined in Table 5.3, the activities required for the construction phase of the proposed project represents the greatest risk of potential impact on the geological and hydrogeological environment. These activities primarily pertain to the site preparation, excavation, levelling and infilling activities required to facilitate construction of the proposed project, and ancillary services.

The potential geological and hydrogeological impacts during the construction and operational phases are presented below. Remediation and mitigation measures included in the design of the proposed Project to address these potential impacts are presented in Section 5.5.

5.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

An analysis of the potential impacts of the Proposed Development on the 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 this Chapter, and Chapter 7 - Hydrology of the EIAR. Remediation and mitigation measures included in the design of this project to address these potential impacts are presented in section 5.6.

5.5.1 Construction Phase

In the absence of mitigation, the following potential effects to land, soil and groundwater (hydrogeology) have been considered:

- Excavation of soil during trenching for the cable works including the local removal and reinstatement (including infilling) will not change the overall vulnerability category for the Proposed Development as the excavations are localised and shallow in depth. Reinstatement of the ducting routes will be as current.
- The projected HDD will not interfere the groundwater regime on a local or regional scale. It is not anticipated that any unusual or exceptional risk of the contamination of groundwater sources exists at this site.
- 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 local and short-term risk to groundwater quality for the duration of the construction if contaminated water is allowed percolate to the aquifer.

These potential impacts are not anticipated to occur following the implementation of mitigation measures outlined from paragraphs 7.6 onwards.

There will be a limited local loss of agricultural soil however, the area of development is small in the context of the overall land available in the region and has not been in Summary of Construction Phase Impacts

A summary of construction phase impacts for the proposed development (with and without mitigation) following EPA (2017) EIA guidelines is provided below.

The magnitude of the impact for the construction phase without mitigation (design) measures is *Temporary* in duration with a *Not Significant impact* rating to the underlying aquifer across the proposed development site.

However, with the implementation of design measures and mitigation measures (Section 5.6 below) for the proposed development site the impact of the construction phase is *Temporary* in duration with an *Imperceptible impact* rating.

5.5.2 Operational Phase

During the operational phase of the proposed project, there is limited potential for site activities to impact on the geological and hydrogeological environment of the area as the proposed project is a grid connection and the area will be backfilled and reinstated as current. There will be no impact on local or regional groundwater resources as a result of the proposed project.

5.6 REMEDIAL AND MITIGATION MEASURES

The design has taken account of the potential impacts of the development on the land, soils, geology and hydrogeological environment local to the area where construction is taking place. Measures have been incorporated in the design to mitigate the potential effects on the surrounding soils, geology and hydrogeology. These are described below.

Due to the inter-relationship between soils, geology, hydrogeology, ecology and hydrology, the following mitigation measures discussed will be considered applicable to all. Waste Management is also considered an interaction in some sections.

5.6.1 Construction Phase

In order to reduce the potential for any adverse impacts on the existing hydrological environment, a number of mitigation measures will be adopted as part of the construction works on site.

Project Engineers Clifton Scannell Emerson Associates (CSEA) have prepared an *Outline Construction Environmental Management Plan (CEMP)* (2022) that is included with the application documentation. The Contractor will be required to operation in compliance with a CEMP and the mitigation measures included in this chapter to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection.

The CEMP follows 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;

- Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites;
- CIRIA 697, The SUDS Manual, 2007; and
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004.

5.6.1.1 Control of Soil Excavation

Subsoil will be excavated to facilitate the construction of gridline route and other ancillary works. The proposed project 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, with as much material left in situ as possible.

It is unlikely that any contaminated material will be encountered during the construction phase of the proposed project. Nonetheless, any excavation works will be carefully monitored 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.

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 an appropriate earthworks handling protocol during the construction phase..

The volume of material to be excavated has been estimated by the project engineers at c. 7,000 m^3 and will be required to be removed from site. When material is to be removed off-site it will be taken for off-site reuse, recovery and / or disposal. Refer to Chapter 13 – Waste Management for further detail.

5.6.1.2 Sources of Fill and Aggregates

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.

5.6.1.3 Fuel and Chemical Handling

The following mitigation measures will take place at the Construction Phase in order to prevent any spillages to ground of fuels and prevent any resulting soil and / or groundwater quality impacts:

- 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 to carry a spill kit;
- Operatives must have spill response training; and
- Drip trays shall be used on any required mobile fuel units.

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

- All fuel/ oils are to be stored at the construction compound within the Edgeconnex site at Ballymakaily West of Newcastle Road (R120), Lucan, Co. Dublin 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.

Concrete Run-off

Concreting operations carried out near surface water drainage points during construction activities could lead to discharges to a watercourse. No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within 10 meters of an existing surface water drainage point. Wash-outs will only be allowed to take place in designated areas with an impervious surface. All ready-mixed concrete will be brought to the 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 waste waters or contaminated storm water to the underlying subsoil. Wash-down and washout of concrete transporting vehicles will take place at an appropriate facility off-site.

5.6.1.4 Accidental Spills

No bulk chemicals will be stored within the active construction areas. Temporary oil and fuel storage tanks will be kept in the material storage area (contractor compound) in suitable containers and will be appropriately bunded as required.

Spill protection equipment such as absorbent mats, socks and sand will be available to be used in the event of an accidental release during refuelling. Training will be given to appropriate site workers in how to manage a spill event.

Emergency response procedures will be in place in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

5.6.1.5 Control of Water during Construction

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. Correct management will ensure that there will be minimal inflow of shallow / perched groundwater into any excavation. In the unlikely event that collected water is contaminated it will be collected and removed off site for licenced disposal.

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 off-site impacts. All run-off will be prevented from directly entering into any water courses / drainage ditches.

5.6.2 Operational Phase

During the operational phase of the proposed project, there is limited potential for site activities to impact on the geological and hydrogeological environment of the area as the proposed project is a grid connection and the area will be backfilled and reinstated as current. There will be no impact on local or regional groundwater resources (abstraction) as a result of the proposed project.

5.7 CUMULATIVE IMPACT ASSESSMENT

The cumulative impact of the proposed development with any/all relevant other planned or permitted developments (as described in Table 2.1 and Chapter 3) are discussed below.

5.7.1 Construction Phase

The anticipated cumulative effects of the Proposed Project in combination with existing, permitted and proposed developments are addressed below.

In relation to the potential cumulative impact on the geological or hydrogeological environment during the construction phases, there is a potential for local contamination of soils and groundwater from accidental spillage and leakage from construction traffic and construction materials. There is no potential for impact in the groundwater regime as no dewatering required.

The works contractors for the Proposed Development and other planned or permitted developments (as described in Table 2.1) will be obliged to ensure that measures are in place to protect soil and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016).

The implementation of mitigation measures within each chapter and detailed in Section 5.6; as well as the compliance of adjacent development with their respective planning permissions, will ensure there will be minimal cumulative potential for change in soil quality or the natural groundwater regime during the construction phase of the proposed development. The residual impact of the proposed development in combination with other planned or permitted developments (as described in Chapter 3) is **temporary-imperceptible-neutral**.

5.7.2 Operation Phase

During the operational phase of the proposed project, there is no potential for site activities to impact on the geological and hydrogeological environment of the area as the proposed project is a grid connection and the area will be backfilled and reinstated

as current. There will be no impact on local or regional groundwater resources (abstraction) as a result of the proposed project.

5.8 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

5.8.1 Operational Phase

During the operational phase of the proposed project, there is limited potential for site activities to impact on the land, geological and hydrogeological environment of the area as the proposed project is a grid connection and the area will be backfilled and reinstated as current. There will be no impact on local or regional groundwater resources (abstraction) as a result of the proposed project. The residual impact of the proposed development is **temporary-imperceptible-neutral**.

5.8 DO NOTHING SCENARIO

The Do-Nothing scenario refers to the environment as it would be in the future should the proposed project not be carried out. Should the proposed project not proceed the lands are zoned for commercial/ industrial development so would likely have some form of development at some stage in the future, the impacts of which cannot be assessed. There is also the possibility that no development would be progressed at the site in this scenario, in which case there would be no impacts on the geological and / or hydrogeological environment at the site.

5.9 MONITORING

5.9.1 Construction Phase

Weekly checks will be carried out to ensure surface water drains are not blocked by silt, or other items, and that all storage is located at least 10 m from surface water receptors.

Regular inspection of surface water run-off and any sediment control measures (e.g., silt traps) will be carried out during the construction phase.

Regular auditing of construction / mitigation measures will be undertaken, e.g., concrete pouring, refuelling in designated areas, etc. A log the regular inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not occur.

5.9.2 Operational Phase

No future soil or groundwater monitoring is proposed as part of the proposed project as no bulk chemical storage on site. Petrol interceptors will be maintained and cleaned out in accordance with the manufacturer’s instructions. Maintenance of the surface water drainage system and foul sewers as per normal urban developments is recommended to minimise any accidental discharges to ground.

5.10 REINSTATEMENT

Any reinstatement from the construction activities on-site (excavations associated with ancillary / preparation works) will adhere to the design and architectural specifications presented in this application. All fill material to be used will be graded to Project Engineers' specifications.

5.11 REFERENCES

- Chartered Institute of Environmental Health (CIEH) (2015). *The LQM/CIEH S4Uls for Human Health Risk Assessment*.
- Construction Industry Research and Information Association (CIRIA) (2011). *Environmental Good Practice on site; Construction Industry Research and Information Association Publication C692 (3rd Edition - an update of C650 (2005*) (I. Audus, P. Charles and S. Evans).
- Construction Industry Research and Information Association (CIRIA) (2012). *Environmental Good Practic*e on site – pocket book; Construction Industry Research and Information Association publication C715 (P. Charles, and G. Wadams).
- Environmental Protection Agency (EPA) (2003). *EPA Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.*
- Environmental Protection Agency (EPA) (2017). *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.*
- Environmental Protection Agency (EPA) (2002). *EPA Guidelines on the information to be contained in Environmental Impact Statements.*
- Environmental Protection Agency (EPA) (2007). *Code of Practice – Environmental Risk Assessment for Unregulated Waste Disposal Sites*.
- Environmental Protection Agency (EPA) (2021). EPA Online Mapping tool Available on-line at: https://gis.epa.ie/EPAMaps/ [accessed on 30 January 2022].
- Geological Survey of Ireland (GSI) (2021). online shapefile content, Available on-line at: https://data.gov.ie/organization/geological-survey-of-ireland [accessed 30 January 2022].
- Institute of Geologists of Ireland (IGI) (2002). *Geology in Environmental Impact Statements, a Guide.*
- Institute of Geologists of Ireland (IGI) (2013). *Guidelines for the preparation of Soils Geology and Hydrogeology Chapters of Environmental Impact Statements.*
- Marston Planning Consultancy (2021) Environmental Impact Assessment Report Aungierstown Substation and transmission lines Grange Castle South Business Park
- National Roads Authority (NRA) (2009). *Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*.

APPENDIX 5.1

CRITERIA FOR RATING THE MAGNITUDE AND SIGNIFICANCE OF IMPACTS AT EIA STAGE NATIONAL ROADS AUTHORITY (NRA-TII, 2009)

Table 1 Criteria for Rating Site Attributes – Estimation of Importance of Soil and Geology Attributes (NRA)

Importance	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale.	Geological feature rare on a regional or national scale (NHA). Large existing quarry or pit. Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying route is significant on a local scale.	Contaminated soil on site with previous heavy industrial usage. Large recent landfill site for mixed wastes. Geological feature of high value on a local scale (County Geological Site). Well drained and/or high fertility soils. Moderately sized existing quarry or pit. Marginally economic extractable mineral resource.
Medium	Attribute has a medium quality, significance or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and/or soft organic soil underlying route is moderate on a local scale	Contaminated soil on site with previous light industrial usage. Small recent landfill site for mixed wastes. Moderately drained and/or moderate fertility soils. Small existing quarry or pit. Sub-economic extractable mineral resource.
Low	Attribute has a low quality, significance or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying route is small on a local scale.	Large historical and/or recent site for construction and demolition wastes. Small historical and/or recent landfill site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource.

Table 2 Criteria for Rating Site Attributes – Estimation of Importance of Hydrogeological Attributes (NRA)

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status.
Very High	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple well fields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – NHA status. Regionally important potable water source supplying >2500 homes. Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source. Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer. Potable water source supplying >50 homes. Outer source protection area for locally important water source.
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer Potable water source supplying <50 homes

Table 3 Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Soil/ Geology Attribute (NRA)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute	Loss of high proportion of future quarry or pit reserves. Irreversible loss of high proportion of local high fertility soils. Removal of entirety of geological heritage feature. Requirement to excavate/remediate entire waste site. Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Loss of moderate proportion of future quarry or pit reserves. Removal of part of geological heritage feature. Irreversible loss of moderate proportion of local high fertility soils. Requirement to excavate/remediate significant proportion of waste site. Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Loss of small proportion of future quarry or pit reserves. Removal of small part of geological heritage feature. Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils. Requirement to excavate/remediate small proportion of waste site. Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	No measurable changes in attributes
Minor Beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	Moderate enhancement of geological heritage feature
Major Beneficial	Results in major improvement of attribute quality	Major enhancement of geological heritage feature

Table 4 Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Hydrogeological Attribute (NRA)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	Removal of large proportion of aquifer. Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. Potential high risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >2% annually.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Removal of moderate proportion of aquifer. Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems. Potential medium risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >1% annually.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Removal of small proportion of aquifer. Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. Potential low risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >0.5% annually.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Calculated risk of serious pollution incident <0.5% annually.

Table 5 Rating of Significant Environmental Impacts at EIS Stage (NRA)

Importance of Attribute	Magnitude of Importance			
	Negligible	**Small Adverse**	**Moderate Adverse**	**Large Adverse**
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/moderate	Profound/Significant	Profound
High	Imperceptible	Moderate/Slight	Significant/moderate	Profound/Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

6.0 HYDROLOGY (WATER)

6.1 INTRODUCTION

This chapter of the EIAR has been prepared by AWN Consulting Ltd. and assesses and evaluates the potential impacts on the surrounding water & hydrological environment associated with the proposed described in Chapter 2 – Description of Proposed Development.

In assessing likely potential and predicted impacts, account is taken of both the importance of the attributes and the predicted scale and duration of the likely impacts.

A full description of the proposed Project can be found in Chapter 2 - Description of the Proposed Development The characteristics of the proposed project that are relevant in terms of hydrology are summarised below.

6.2 METHODOLOGY

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

- EPA (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- EPA (2015). Draft Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.
- National Roads Authority (NRA) (2009). Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

The rating of potential environmental impacts on the hydrological environment is based on the quality, significance, duration and type of impact characteristic identified. Consideration is given to both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed activities on that cited attribute. The EIAR Guidelines (2022) tables are in Chapter 1 - Introduction. The NRA criteria for rating the magnitude and significance of impacts at EIA stage on the geological related attributes are also relevant in determining impact assessment and are presented in Appendix 6.1.

6.2.1 Sources of Information

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/ and www.catchments.ie
- *National River Basin Management Plan 2018 – 2021.*
- Department of the Environment, Heritage and Local Government (DEHLG) and the Office of Public Works (OPW) (2009). *The Planning System and Flood Risk Management, Guidelines for Planning Authorities.*

- Office of Public Works (OPW). *Flood mapping data*, accessed at www.floodmaps.ie
- Relevant Eastern Catchment Flood Risk Assessment and Management (CFRAM) Flood Reports.
- Eastern Regional Fisheries Board. *Requirements for the Protection of Fisheries Habitat During Construction and Development Works at River Sites*.
- Dublin City Council (2005). *Greater Dublin Strategic Drainage Study (GDSDS): Technical Documents of Regional Drainage Policies.*
- *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).
- Construction Industry Research and Information Association (CIRIA) (2001). *Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, (C532)*.

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

- HDD methodology under Griffen River, CSEA, July 2022.
- Marston Planning Consultancy (2021) Environmental Impact Assessment Report Aungierstown Substation and transmission lines Grange Castle South Business Park

6.2.2 Forecasting Methods and Difficulties Encountered

There were no difficulties encountered in compiling this chapter of the EIAR.

6.3 BASELINE ENVIRONMENT

The proposed development is to be located in the Grange Castle Business Park, Clondalkin, Dublin 22. This land is zoned for development. Much of the lands to the east have been developed as part of the wider Business Park development with green fields to the south and west. Further green fields and Lucan Sarsfields GAA club are located to the north. The gradient of the gridline route runs south to north at 75 metres above ordinance datum (mAOD) at the Kishoge substation to 65 mAOD at the greenfield site west of the current Edgeconnex site.

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 and Baldonnell Stream which are tributaries of the River Liffey.

The Griffeen River (stream) is located to the southwest of the Grange Castle Business Park Site and will be intersected by the proposed gridline route. The Griffeen River rises in the townland of Greenogue, 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 Business Park and associated access roads and it now runs alongside the Grange Castle Business Park internal access road in a northerly direction.

Other notable hydrological features near the Proposed Development are the Camac River and the stream called 'Miltown 09' by the EPA. The River Camac runs from the south to the north-east, approximately 2.5 km south-west of the Proposed Development site. The River Camac catchment from immediately downstream of Baldonnell Business Park has an estimated catchment area of 13.6 km^2 and is steeply to moderately sloping (1% to 10%). The catchment area consists largely of greenfield, a section of the residential areas on the outskirts of Saggart, Baldonnell Business Park and one-off residential/ commercial developments. The Miltown 09 is a small stream running off the Griffeen River and runs through the site from north-west to south-east. The local hydrological environment is shown in Figure 6.1 below

The Griffeen River is a tributary of the Liffey and as such is in direct hydraulic connection to a number of national and European protected site. According to the NPWS (2022) online database, the following area of conservations are in hydraulic connection to the Griffeen:

- North Dublin Bay Special Area of Conservation (SAC) (Site Code 000206) – c. 18.5 km east of the proposed project area.
- South Dublin Bay Special Area of Conservation (SAC) (Site Code 000210) – c. 18.5 km east of the proposed project area
- South Dublin Bay and River Tolka Estuary Special Protection Area (SPA) (Site Code 004024) – c. 18.5 km east of the proposed project area
- Liffey Valley proposed Natural Heritage Area (pNHA) – c. 3.5 km north of the proposed project area.

Refer to Chapter 7 - Biodiversity for further information on Designated Sites.

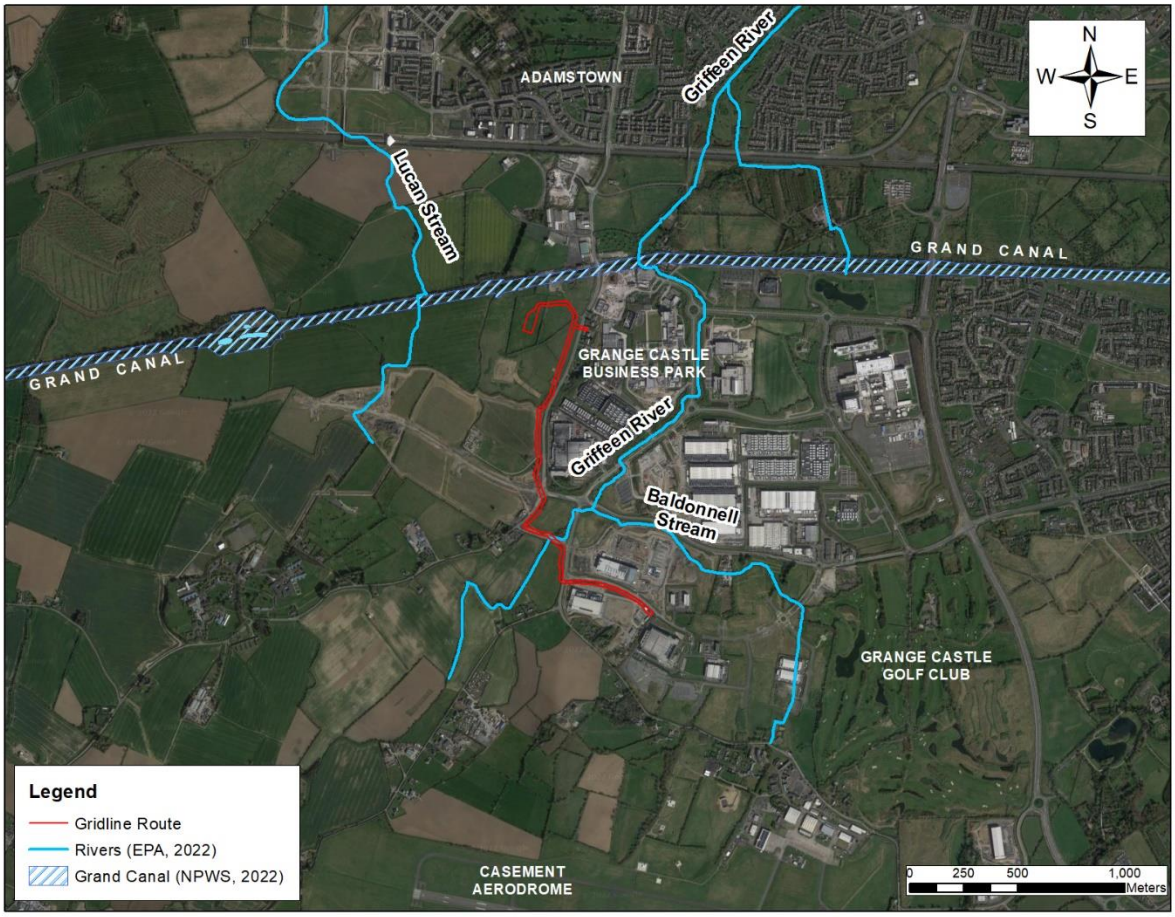


Figure 6.1 Local Hydrological Environment (EPA, 2022)

6.3.1 Surface Water Quality

The European Communities Directive 2000/60/EC establishing a framework for community action in the field of water policy, commonly known as the Water Framework Directive (WFD), requires 'Good Water Status' for all European waters 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'. The second cycle River Basin Management Plan was published in April 2018 and replaced the first cycle plan (2009 – 2015). 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 waterbodies at risk of failing to meet the objectives of the WFD and include a programme of measures to address and alleviate these pressures.

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 S.I. No. 77 of 2019).
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010 as amended by 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).

Figure 6.2, below, presents the EPA surface water quality monitoring points in the context of the Site and regional drainage setting, as well as the waterbodies' WFD risk category. Surface water quality is monitored periodically by the EPA at various regional locations along principal and other smaller watercourses. With reference to the Site of the proposed Project, the nearest EPA monitoring station is situated upstream at the Hole-In-Wall Bridge to the west of the Site on the Mayne River.

The EPA assesses the water quality of rivers and streams across Ireland using a biological assessment method (Q-Value), 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.

With reference to the site setting, the nearest EPA monitoring station is the Griffeen (RS09G010200), located at the first bridge East of Milltown. The status given from the Griffeen station given by the EPA is from 1991 and classified as Q3- Poor. A more recent status, a station at the Lucan Bridge, which monitors the River Liffey, is classified at 'Poor'. This monitoring was undertaken in 2019 and is taken at a point approximately 400 m downstream from where the Griffeen River enters the River Liffey.

In accordance with the WFD, each river catchment within the former Eastern River Basin District (ERBD) was assessed by the EPA and a Water Management Plan detailing the programme of measures was put in place for each. The Griffeen's current status is currently 'under review' with further data required to designate a correct

status. The Griffeen was assigned a status of Moderate in the previous cycle (2013 – 2015). Currently, the EPA classifies the WFD River Waterbody of the River Liffey with a risk score of 1a, 'At risk of not achieving good status' (see Figure 6.2)

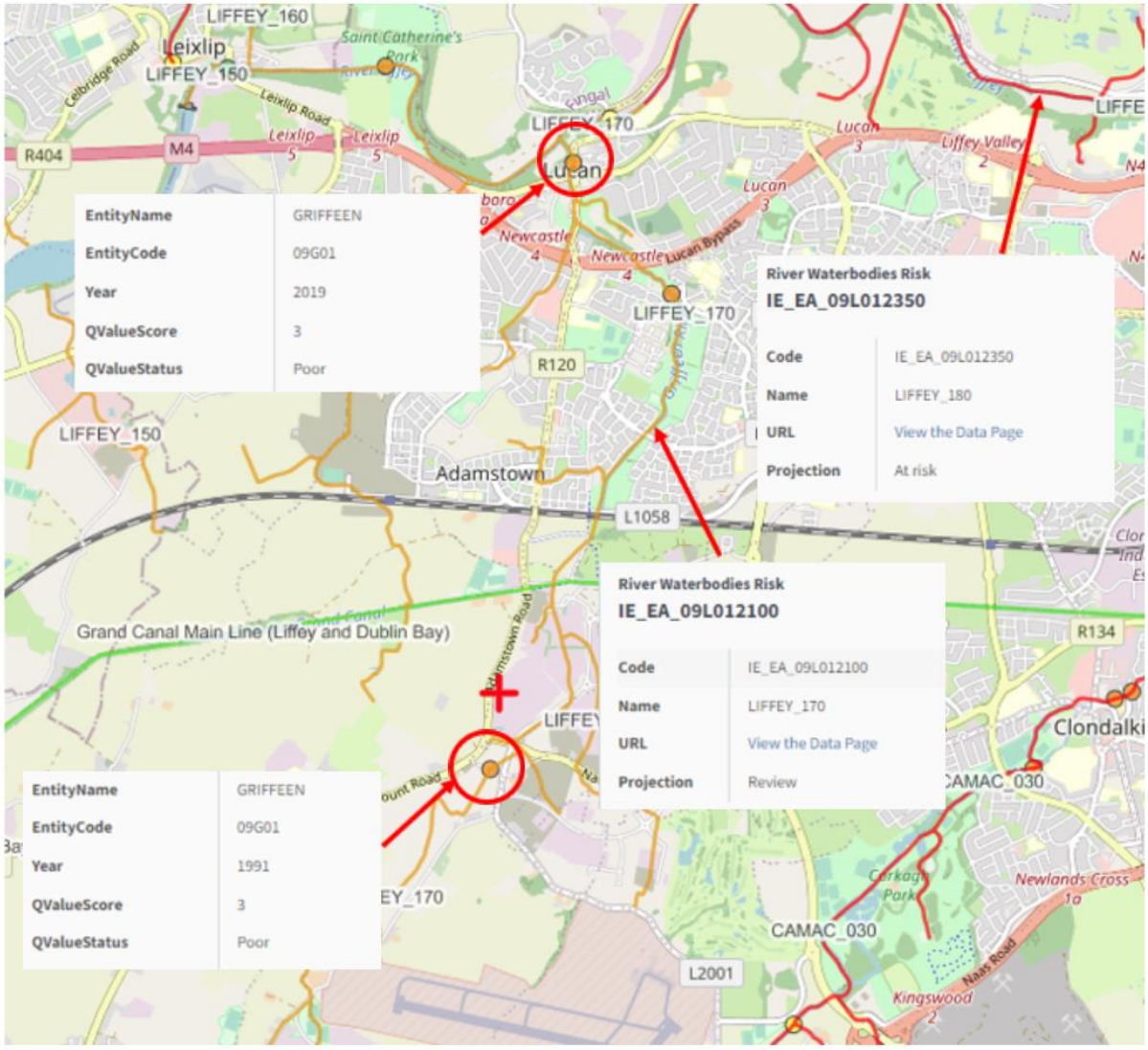


Figure 6.2 Local Hydrological Environment and current WFD rating & Q Values. (Site location shown with red cross) (EPA, 2022)

6.3.2 Local Drainage

As part of the realignment of the Nangor Road, and as part of flood alleviation works, South Dublin County Council (SDCC) has realigned the Baldonell Stream watercourse to the east of the Grange Castle Business Park to continue along the southern edge of the Nangor Road, at surface, before continuing, via a culvert, to outfall to the Griffeen upstream of its original confluence at a new confluence immediately southeast of the new Nangor Road – Baldonnell Road junction. Storm water runoff from the sites to the South (Cyrus One etc.) will outfall to the Baldonnel Stream and then into the Griffeen River. The outfall to the Baldonnel Stream and Griffin Rivers is controlled through the permitted attenuation ponds granted under SDCC Planning Reg. Ref. SD20A/0121 that will receive storm water which has passed through gully's (to aid in the removal of debris) and a suitably sized oil separator to ensure any hydrocarbon pollution is removed prior to storm water entering the attenuation pond (for the areas to the south

of the Business Park). Other permitted developments to the north surface waters outfall to the Grifeen via attenuation and oil water separators as per the relevant permissions.

6.3.3 Flooding

A desktop flood risk assssessment has been completed by AWN based on the available information and with regard to the OPW Document titled 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' (OPW Guidelines 2009).

One historical flood event in the area was identified to immediately to the west the gridline route on the Peamount Road. (Flood Summary ID-3320) which was recorded in 2000 and was associated with a freak storm event. OPW CFRAM Study HA09 maps indicate that the site is located within Flood Zone B. Pluvial flood maps produced as part of the OPW CFRAM flood maps indicate that the site is not at risk from pluvial flooding. No pluvial flood zones are identified at the site; however, areas of localised pluvial flooding have been identified in the surrounding area. Though due to existing drainage infrastructure in place, it is not anticipated that pluvial flooding would have a significant impact on the site. The groundwater underneath the site is located within a Locally Important Aquifer (Ll) –Bedrock which is Generally Moderately. Productive only in Local Zones. The vulnerability of the aquifer is extreme. However, based on a review of available records there is no evidence of groundwater flooding at or near the site.

The OPW Guidelines provides description for different types of development (table 3.1 in the guidelines page 25) but with no specific reference to electricity cables installation systems. However, AWN considers the proposed ESSDUB98 Kishoge Substation Grid Connection cable installation to be in the spectrum of less vulnerable to water-compatible type of development. The OPW Guidelines 2009 also present a matrix of vulnerability versus flood zone (table 3.2 in the guidelines page 26). This matrix illustrates appropriate developments that are required to meet the justification test. AWN conclude that all of the proposed development elements reasonably fall within the sections of the matrix which are defined as 'Appropriate' as outlined in Table 3.2 of the OPW Guidelines 2009.

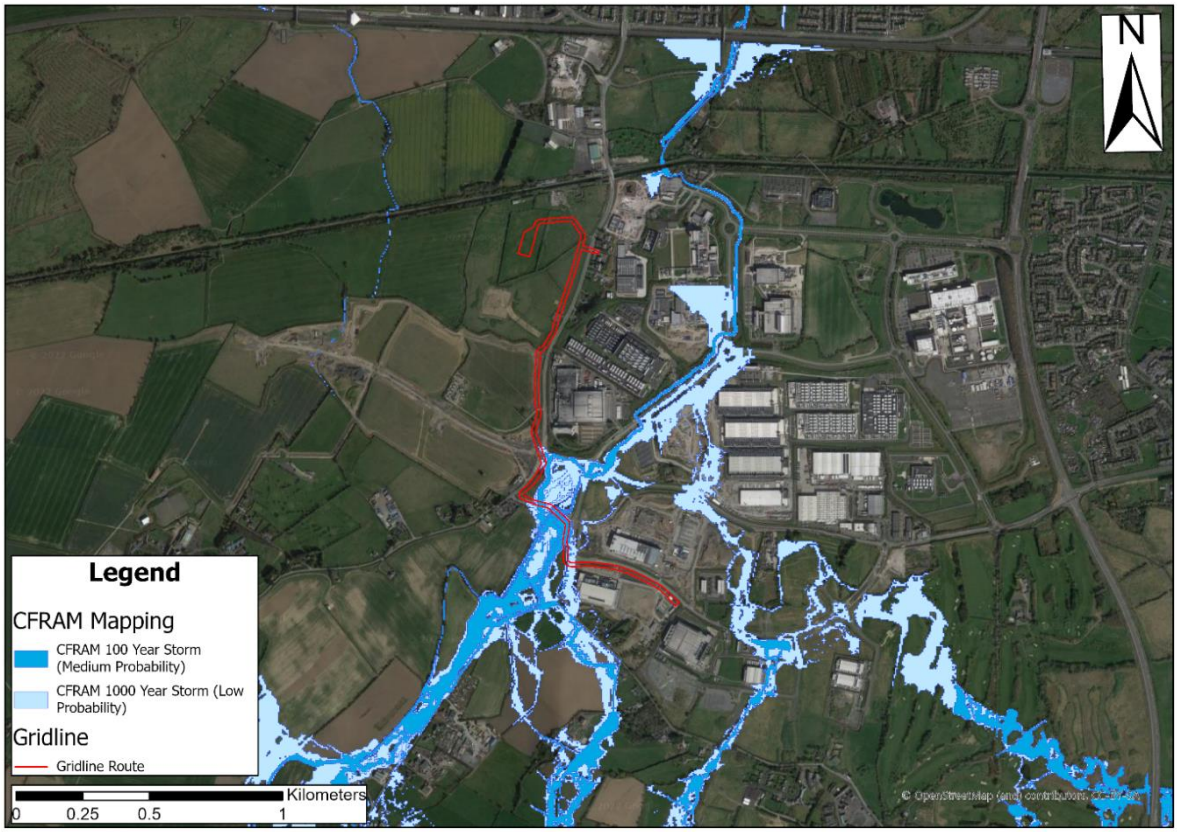


Figure 6.3 CFRAM Flood Mapping along Gridline Route (EPA, 2022)

6.3.4 Areas of Conservation

The Grifeen River is a tributary of the Liffey and as such is in direct hydraulic connection to a number of national and European protected site. According to the NPWS (2022) online database, the following area of conservations are in hydraulic connection to the Griffeen:

- North Dublin Bay Special Area of Conservation (SAC) (Site Code 000206) – c. 18.5 km east of the proposed project area.
- South Dublin Bay Special Area of Conservation (SAC) (Site Code 000210) – c. 18.5 km east of the proposed project area
- South Dublin Bay and River Tolka Estuary Special Protection Area (SPA) (Site Code 004024) – c. 18.5 km east of the proposed project area
- Liffey Valley proposed Natural Heritage Area (pNHA) – c. 3.5 km north of the proposed project area.

Refer to Chapter 7 - Biodiversity for further information on Designated Sites.

6.3.5 Rating of Site Importance of Hydrological Features

Based on the NRA criteria for rating the importance of hydrological features (refer to Appendix 6.1), (i.e., Griffeen River and Baldonnell Stream) has been considered as having low to medium quality significance or value on a local scale. Due to the Quality Class C (Biotic Index Q3, Q2- 3), its status as a local potable water source supplying <50 homes and its low amenity value.

6.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development is described in chapter 2. The activities associated with the proposed Project which are relevant to the hydrological environment are as follows.

Construction

- Shallow excavations are required for the ducting for the 110kV transmission lines.
- Possible discharge of collected clean rainwater which currently goes to ground during excavation works and groundworks (the extent of which is dependent on the time of year development works are carried out).
- Construction activities will necessitate storage of cement and concrete materials, 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
- Crossing of the Griffeen River.

With regard to the cross of the Griffen River, a horizontal directional drill (HDD) methodology has been developed in support of the proposed selected route.

Operational

Due to the nature of the proposed gridline development, there will be no operational activities required and as such there will be no operational impact to the hydrological environment.

Remediation and mitigation measures included in the design of the Proposed Project to address these potential impacts are presented in Section 6.5.

Reinstatement

Reinstatement of excavations during the construction phase of the proposed project will meet the design criteria presented in the design specification of this application. All fill material used will be clean and graded to engineers' specifications

6.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

An analysis of the potential impacts of the proposed Project on the hydrological environment during the construction and operational phases is outlined below. Due to the inter-relationship between surface water (hydrology) and soils, geology and hydrogeology, the following impacts discussed will be considered applicable to both Chapters 6 (Lands, Soils, Geology and Hydrogeology) and this Chapter of this EIAR. The potential for significant impacts to arise as a result of the interaction between these topics / environmental media has been comprehensively addressed herein.

6.5.1 Construction Phase

6.5.1.1 Increase in Run Off & Sediment Loading (Crossing the Griffeen)

In the absence of mitigation, surface water run-off during the construction phase may contain increased silt levels or otherwise become polluted from construction activities. The Griffeen River intersects the proposed development route to the south. The

Griffeen is a tributary of the River Liffey and in direct hydraulic connection to a number of national and European designated sites in Dublin Bay (see section 6.3).

As mentioned above, a HDD will be carried out for the Griffeen River crossing. It is proposed to drill a single bore700mm in diameter for each 110kV HV circuit borehole. Each borehole will house 3No. 225mm HV ducts and 1No. 140mm Comms duct. Prior to any HDD works GPR survey will be undertaken to locate all known existing infrastructure/utilities, parallel runs and lateral crossings along the proposed route of the HDD's and obtain depths and position.

A risk evaluation will be performed, considering overhead, surface, and subsurface hazards.

The site will be examined for indications of possible unmarked utilities. Trial excavations to be undertaken as proposed in Site investigation works drawings and carried out in accordance with the Code of Practice for Avoiding Danger from Underground Services.

After the above measures have been undertaken and all known crossings/infrastructure locations identified HDD route will be proposed making sure of safe separation distances from confirmed services and Griffen River. Permit to drill and all other relevant pre-start documentation to be issued before commencement of any works.

Only designated routes are to be used to access the work area as agreed with the contractor. TMP to be adhered to for construction traffic routes. No roots or branches are to be cut without further consultation with environmental team all exposed routes to be covered with wet hessian sandbags with particular care to be taken of branches when travelling down the access tracks.

The main environmental risk regarding a HDD operation is hydro fracture. A hydro fracture or 'frac-out' is the unintentional return of drilling fluids to the surface during HDD. A frac-out occurs when the down hole mud pressure exceeds the overburden pressure (i.e. shallow or loose sections of the bore), or the fluid finds a preferential seepage pathway.

Drilling fluid is comprised primarily of water and approximately 1 to 3% bentonite, a naturally occurring clay mineral, so it is, in most circumstances, a non-toxic, benign fluid (except when suspended within a water body and it can harm ecology).

Additionally, during the construction phase, there is the potential for a slight 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.

6.5.1.2 Contaminated Surface Water Drainage

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

- Spillage or leakage of oils and fuels stored on-site or refuelling on-site;
- Spillage of oil or fuel from refuelling machinery on-site;

- Spillage or leakage of oils and fuels from construction machinery or Site vehicles; and
- Alkaline run-off from the use of wet concrete and cement.

There shall not be discharge of silty water from the works to any watercourse, should any discharge of construction water be required during the construction phase, discharge will be to foul sewer following agreement with SDCC/ Irish Water. Pre-treatment and silt reduction measures on-site will include a combination of silt fencing, settlement measures (silt traps, 20 m buffer zones, silt sacks and settlement tanks / ponds) and hydrocarbon interceptors.

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 section 6.6 onwards will ensure that any impact will be mitigated.

6.5.2 Operational Phase

Due to the nature of the proposed gridline development, there will be no operational activities required and as such there will be no operational impact to the hydrological environment.

6.6 MITIGATION MEASURES

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

6.6.1 Construction Phase

Construction Environmental Management Plan

Project Engineers Clifton Scannell Emerson Associates have prepared an *Outline Construction Environmental Management Plan (CEMP)* (2022) that is included with the application documentation. The construction phase mitigation measures set out in the EIAR are duplicated in the CEMP, these will be implemented by the construction Contractor to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection.

The CEMP follows best international practice including but not limited to:

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

Surface Water Crossing

As stated in Section 6.5.1 the Griffeen River intersects the proposed development route to the south. Consultation has been undertaken with Inland Fisheries Ireland and South Dublin County Council and on the basis of their responses the contractor will be required to prepare a Method Statement the proposed crossing of the Griffeen.

As mentioned above, a horizontal directional drill (HDD) methodology has been developed in support of the proposed selected route. This method statement will require approval by IFI and SDC prior to commencement of construction of the crossing.

HDD design will detail a drill profile, considering all physical features such as topography, geotechnical information, existing infrastructure/utilities, and any other relevant information. Parameters such as specific depth targets and pipe bending radii will be considered when developing the HDD bore plan.

A 'Permit to Drill' will be issued and signed by all relevant parties when the drill route has been finalised and agreed. If required, a metered standpipe and license will be obtained from IW in relation to the HDD location.

A launch pit will be excavated over the entry point (or close by) using a mechanical excavator to facilitate the containment of drill fluids/solids. The work areas will be laid out in accordance with the contractors' specifications and traffic management plans as necessary. Fencing will be installed to restrict access and ensure public and worker safety. The exit area will be utilised as a pipe staging zone. Prior to drilling, the drilling fluids will be mixed and sufficient quantities will be available to complete the pilot bore, pre- reaming, and reaming passes

Frac-out risk monitoring starts at the planning stage. Bores have to be designed to create as large a radius of curvature as possible within the limits of the site, pipe, and equipment. This design is important in that it will allow the mud returns to flow back to the exit pit and entry pit. The geological conditions that will be determined by site specific Site investigations will dictate the 3D alignment of the HDD.

The influence of geology has a major impact on the correct product selection. A fluid system must be designed based on respective geology. The correct viscosity of drilling fluid will remove cuttings from the borehole and reduce the risk of frac-out.

Pump rates & volume of fluids will be based on calculations which are derived from the anticipated ground conditions encountered and different stages of the operation. This will be continuously monitored during HDD operations and subject to change.

Launching & reception pits to be of sufficient size to hold excess amount of water/drilling fluid to prevent run off during drilling, if necessary, these will be bunded or sand bagged. Due care is required when managing the drilling.

It is not anticipated that any unusual or exceptional risk of the contamination of groundwater sources exists at this site.

The crossing will be temporary, requiring less than two weeks work in the area of the river. The methodology will be similar to the following:

The work area will be fenced off. Regular visual inspections will be maintained to ensure flow and water quality is maintained at all times.

Surface Water Runoff

Due to the distance from the proposed gridline route to the nearest designated/ protected sites in Dublin Bay (18.5 km) there will be no potential for impact to these sites even without mitigation.

Where required collected 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, settlement measures (silt traps, silt sacks and settlement tanks / ponds).

There shall not be discharge of silty water from the works to any watercourse, should any discharge of construction water be required during the construction phase, discharge will be to ground (as current for clean run-off) and foul sewer.

Any temporary storage of spoil, hardcore or similar material will be stored as far as possible from any surface water drains (minimum 20 m buffer zones) and also stored in receptacles where possible. Stockpiles will be tightly compacted to reduce run-off and graded to aid in run-off collection, and materials will be stored away from any surface water drains.

In order to minimise the risk of contamination, any stockpiled material designated for removal will be removed off-site as soon as possible. Surface water drain gratings in areas near or close to where stockpiles are located will be covered by appropriate durable polyurethane covers or similar.

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 avoid any potential impact.

Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site and the suitable distance (minimum 20 m buffer zone) of topsoil piles from any surface water drains will be maintained as per the recommendations of Inland Fisheries Ireland's Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (2016).

Concrete Run-off

No concreting operations will be carried out near surface water drainage apart from where required for the river crossing works. No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within 10 meters of an existing surface water drainage point. Wash-outs will only be allowed to take place in designated areas with an impervious surface. 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 waste waters or contaminated storm water to the underlying subsoil. Wash-down and washout of concrete transporting vehicles will take place at an appropriate facility off-site.

Fuel and Chemical Handling

The following mitigation measures will be implemented during the construction phase in order to prevent any spillages to ground of fuels and prevent any resulting to surface water systems:

- Refuelling only to be undertaken within the contractors yard
- 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 to carry a spill kit and operatives must have spill response training;
    - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

Accidental Releases

No bulk chemicals will be stored within the active construction areas.

Spill protection equipment such as absorbent mats, socks and sand will be available to be used in the event of an accidental release during refuelling.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

Soil Removal and Compaction

The volume of material to be excavated has been estimated by the project engineers at c. 7,000 m^3. It is envisaged that all of the excavated material will be required to be removed from site.

6.6.2 Operational Phase

Due to the nature of the proposed gridline development, there will be no operational activities required and as such there will be no operational impact to the hydrological environment.

6.7 CUMULATIVE IMPACT ASSESSMENT

The cumulative impact of the proposed development with any/all relevant other planned or permitted developments (as described in Chapter 3) are discussed below.

6.7.1 Construction Phase

In relation to the potential cumulative impact on hydrology during the construction phases, the construction works which would have potential cumulative impacts are as follows:

- Surface water run-off during the construction phase may contain increased silt levels or become polluted from construction activities.
- Contamination of local water sources from accidental spillage and leakage from construction traffic and construction materials.

The works contractors for this development and planned or permitted developments (as described in Table 2.1 and Chapter 3) will be obliged to ensure that measures are in place to protect soil and water quality in compliance with legislative standards for

receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016).

Substantial developments that may result in in-combination effects in respect of the Griffeen River are development ABP-309951-21 at the Edge Connex Ireland Site and SD20A/0283 at the Microsoft Operations Ireland Site both with in the curtilage of the Grange Castle Business Park Site are the relevant projects considered in detail.

The proposed development at the ABP-309951-21 at the Edge Connex Ireland site. For the provision of two 110kV transmission lines along with associated and ancillary works. The route of the transmission lines will pass along and under the internal road infrastructure within the Edgeconnex site and Grange Castle Business Park; above the culverted Griffeen River and along a wayleave to the north of the Griffeen River to the joint bays where it will connect into the Grange Castle - Kilmahud Circuits. The proposed route will be above the current culverted section of the Griffeen so there will be no impact from intersection the river. Also, Section 5 of the ABP decision to grant planning states a CEMP must be submitted and agreed with the local planning authority in line with the included EIAR.

The proposed development SD20A/0283 at the Microsoft Operations Ireland site included the following “Provision of 168 permanent car parking spaces and 40 cycle parking spaces; Provision of additional western access to the MS campus (to serves the Central Administration Building) from the Business Park estate road (including bridge over the Griffeen River) with existing temporary access to be extinguished”. Condition 5 states that prior to the commencement of works a finalised Construction and Environmental Management Plan must be submitted to the planning authority (SDCC) to avoid pollution through surface water runoff, as well as to ensure the safe storage and handling of hydrocarbons, other chemicals, concrete and cement on the site, as well as the employment of an ecologist to supervise the carrying out of these measures. Section 12 of the grant of permission also stated a Section 50 Licence must be obtained from the OPW to facilitate the construction of the bridge on the Griffeen. Section 17 also requests the Method Statement for the Bridge Construction

The implementation of mitigation measures detailed in Section 6.6; as well as the compliance of adjacent development with their respective planning permissions, will ensure there will be minimal cumulative potential for change in the natural surface water regime, particularly the Griffeen River during the construction phase of the proposed development. The residual impact of the proposed development in combination with other planned or permitted developments is **short-term-imperceptible-neutral**.

6.7.2 Operational Phase

Due to the nature of the proposed gridline development, there will be no operational activities required and as such there will be no operational impact to the hydrological environment. **long-term-imperceptible-neutral**.

6.8 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

The proposed Project will have no significant impact on the natural surface water regime either qualitatively or quantitatively. As such the residual impact is **long-term-imperceptible-neutral**.

6.9 DO NOTHING SCENARIO

The Do-Nothing scenario refers to the environment as it would be in the future should the proposed project not be carried out. As the lands are zoned for industrial/ commercial development they would likely have some form of development at some stage in the future in the wider business park site, the potential impacts of which cannot be assessed. There is also the possibility that no development would be progressed at the site in this scenario, in which case there would be no impacts on the current hydrological environment at the site.

6.10 MONITORING

6.10.1 Construction Phase

During the crossing of the Griffeen River regular ongoing checks will be made by the contractor onsite to ensure no adverse impact on the Griffeen.

6.10.2 Operational Phase

No monitoring is required.

6.11 REFERENCES

- Environmental Protection Agency (EPA) (2017). Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Environmental Protection Agency (EPA) (2015). Draft Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.
- Marston Planning Consultancy (2021) Environmental Impact Assessment Report Aungierstown Substation and transmission lines Grange Castle South Business Park
- National Roads Authority (NRA) (2009). Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- The OPW Document titled ‘The Planning System and Flood Risk Management – Guidelines for Planning Authorities’ (OPW Guidelines 2009)

APPENDIX 6.1

NRA IGI HYDROLOGY RATINGS

Table 10.1: Criteria for rating impact magnitude at EIS stage – Estimation of magnitude of impact on hydrology attributes (NRA, 2009)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and/ or quality and integrity of attribute	Loss or extensive change to a water body or water dependent habitat
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Calculated risk of serious pollution incident >1% annually2
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Increase in predicted peak flood level >10mm1
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Negligible change in predicted peak flood level1
Minor Beneficial	Results in minor improvement of attribute quality	Calculated reduction in pollution risk of 50% or more where existing risk is <1% annually2
Moderate Beneficial	Results in moderate improvement of attribute quality	Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually2
Major Beneficial	Results in major improvement of attribute quality	Reduction in predicted peak flood level >100mm1

Additional examples are provided in the NRA Guidance Document

1 Refer to Annex 1, Methods E and F, Annex 1 of HA216/06

1 Refer to Appendix B3 / Annex 1, Method D, Annex 1 of HA216/06

Source: 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the National Roads Authority (NRA, 2009)

Table 10.2 Criteria for Rating Impact Significance of Hydrological Attributes (NRA, 2009)

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status Regionally important potable water source supplying >2500 homes Quality Class A (Biotic Index Q4, Q5) Flood plain protecting more than 50 residential or commercial properties from flooding Nationally important amenity site for wide range of leisure activities
High	Attribute has a high quality or value on a local scale	Salmon fishery Locally important potable water source supplying >1000 homes Quality Class B (Biotic Index Q3-4) Flood plain protecting between 5 and 50 residential or commercial properties from flooding Locally important amenity site for wide range of leisure activities
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2- 3) Flood plain protecting between 1 and 5 residential or commercial properties from flooding
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding Amenity site used by small numbers of local people

Source: 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the National Roads Authority (NRA, 2009)

APPENDIX 6.2

HDD METHODOLOGY UNDER GRIFFEEN RIVER

PREPARED BY CSEA

Clifton Scannell Emerson Associates

HDD methodology under Griffen River

Client: Edgeconnex

Date: 20th July 2022

Job Number: 21_100

Civil Engineering | Structural Engineering | Transport Engineering | Environmental Engineering | Project Management | Health and Safety

CONSULTING ENGINEERS

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Document Control Sheet

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Issue No.	Issue Status	Date	Prepared by	Checked by
1.0	DRAFT	18/07/2022	ZS	HF

Table of Contents

1 INTRODUCTION

On behalf of the client EdgeConnex Ireland Limited as a part of Strategic Infrastructure Development (SID) planning application a design has been prepared for a provision of underground 110kV transmission line connections between the Kishoge 110kv Gas Insulated switchgear (GIS) substation on a site within the townland of Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin, and the permitted Aungierstown – Castlebaggot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnel, Dublin 22. The proposed transmission lines provide for a loop-in connection to the permitted Aungierstown – Castlebaggot transmission line.

The following horizontal directional drill (HDD) methodology has been developed in support of the proposed selected route.

The technique of Horizontal Directional Drilling (HDD) was selected specifically to avoid conflict with the Griffen river, and as one of the family of civil engineering techniques known as “Trenchless Technology”, is used to install utility ducts without impact to the river. In addition, the integrity of cable ducts installed at depth, in solid geology, is considerably enhanced precluding the requirement to re-excavate at regular intervals for repair and restoration.

2 SITE LOCATION

It is proposed to install 2 No. 110kV HV circuits in two separate boreholes by means of Horizontal Directional Drilling (HDD) to cross underneath the Griffen River in close proximity of Old Nangor Road and Baldonnel road junction in Polly Hops lands, Clutterland, Dublin. (See Figure 1 below).

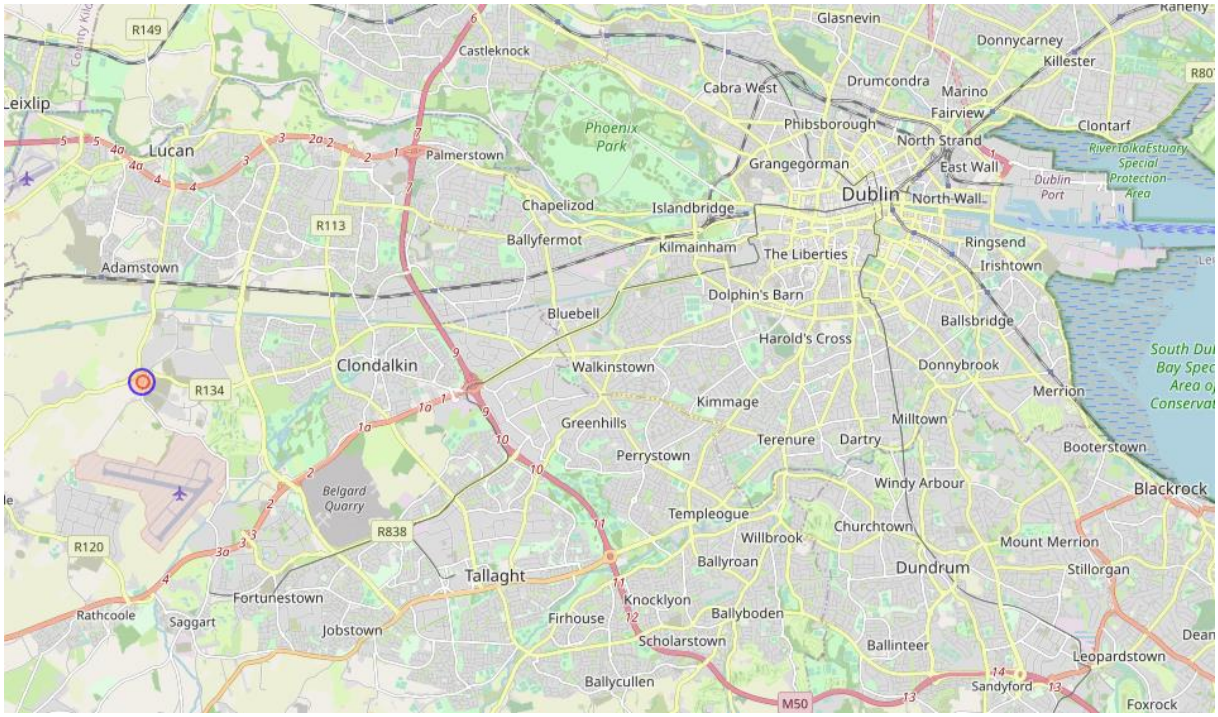

Figure 1 – Overview of HDD location in Dublin area

3 GEOTECHNICAL INFORMATION

Publicly available mapping from the Geological Survey of Ireland (2018) identifies
Dark limestone & shale (Lucan Formation).
The formation comprises dark grey to black, fine-grained, occasionally cherty, micritic limestones that weather paler, usually to pale grey. There are rare dark coarser grained calcarenitic limestones, sometimes graded, and interbedded dark-grey calcar.

Site specific SI was commissioned by the client and 2 No. boreholes were proposed at the launching and receiving pits to confirm the ground conditions.

4 HORIZONTAL DIRECTONAL DRILL (HDD) METHODOLOGY

4.1 OVERVIEW

It is proposed to drill a single bore700mm in diameter for each 110kV HV circuit borehole. Each borehole will house 3No. 225mm HV ducts and 1No. 140mm Comms duct as per figure below.

Figure 2 – Indicative HDD duct formations

Existing utility drawings have been supplied to assess the design of the HDD technique. Prior to any HDD works GPR survey will be undertaken to locate all known existing infrastructure/utilities, parallel runs and lateral crossings along the proposed route of the HDD's and obtain depths and position.

A risk evaluation will be performed, considering overhead, surface, and subsurface hazards.

The site will be examined for indications of possible unmarked utilities. Trial excavations to be undertaken as proposed in Site investigation works drawings and carried out in accordance with the Code of Practice for Avoiding Danger from Underground Services.

After the above measures have been undertaken and all known crossings/infrastructure locations identified HDD route will be proposed making sure of safe separation distances from confirmed services and Griffen river.

Permit to Drill and all other relevant pre-start documentation to be issued before commencement of any works.

4.2 PRECAUTIONS & LIMITATIONS

Access & egress to be restricted and limited to only those necessary to carry out the works. Site Specific Risk Assessment to be carried out every day on site and everyone on site to sign and acknowledge.

Permit to drill to be followed and all reasonably practicable steps to be used to locate any underground. No person shall enter an unsupported excavation without prior assessment by a competent person and Temporary Works Design. Traffic Management Plan (TMP) must be followed for construction routes and site access.

4.3 ECOLOGY

Only designated routes are to be used to access the work area as agreed with the contractor. TMP to be adhered to for construction traffic routes. No roots or branches are to be cut without further consultation with environmental team all exposed routes to be covered with wet hessian sandbags with particular care to be taken of branches when travelling down the access tracks.

To mitigate the impact on the otter holt located at the North bank of Griffeen river, the proposed launching and receiving pits of the HDD will be positioned min. 50m from its location. See figure 3 below.

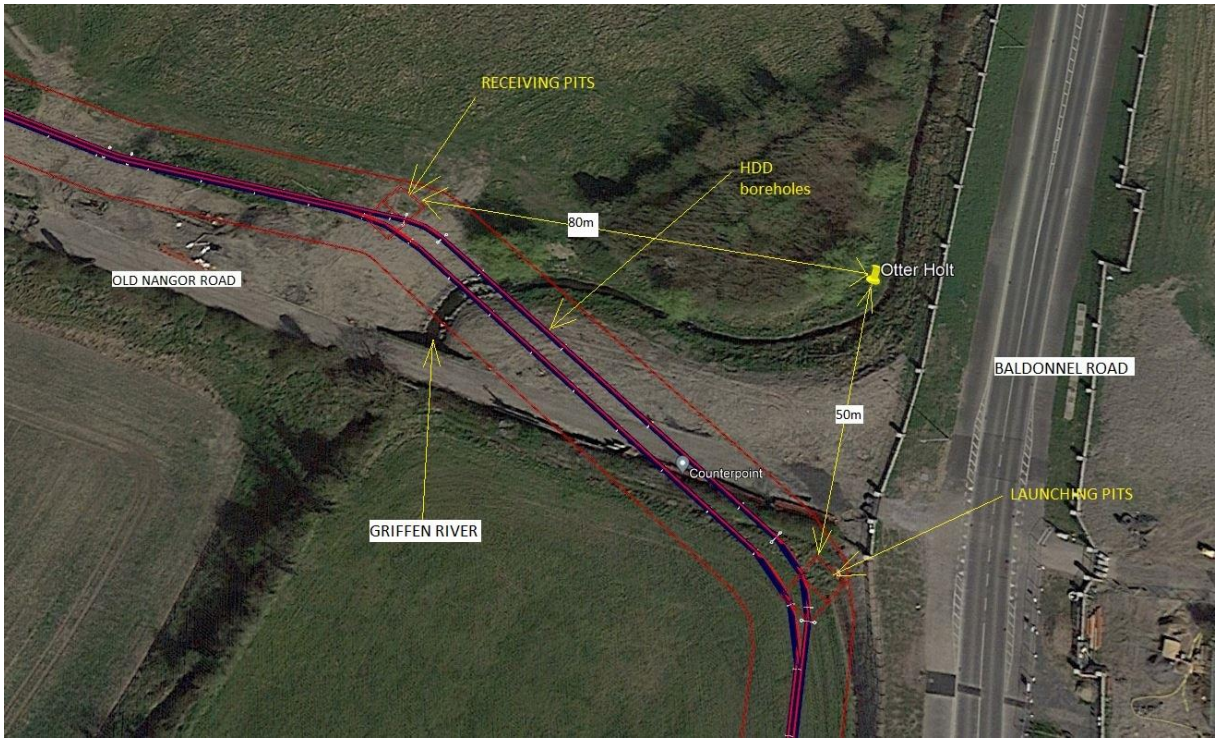

Figure 3 – Proposed HDD location

4.4 PROJECT PREPARATION

A list of equipment and materials necessary for the proposed HDD will be prepared.
HDD design will detail a drill profile, considering all physical features such as topography, geotechnical information, existing infrastructure/utilities, and any other relevant information. Parameters such as specific depth targets and pipe bending radii will be considered when developing the HDD bore plan.
A 'Permit to Drill' will be issued and signed by all relevant parties when the drill route has been finalised and agreed. If required, a metered standpipe and license will be obtained from IW in relation to the HDD location.

4.5 MOBILISATION

Alignment, Entry and Exit point coordinates to be set-out as per approved design drawings.
The drill rig will be off-loaded and positioned over the bore centre line.
A launch pit will be excavated over the entry point (or close by) using a mechanical excavator to facilitate the containment of drill fluids/solids. The work areas will be laid out in accordance with the contractors' specifications and traffic management plans as necessary. Fencing will be installed to restrict access and ensure public and worker safety. The exit area will be utilised as a pipe staging zone. Prior to drilling, the drilling fluids will be mixed and sufficient quantities will be available to complete the pilot bore, pre-reaming, and reaming passes.

4.6 SEQUENCE OF WORKS

PILOT HOLE

- Setup drill rig to alignment and entry point.
- Connect assembly to the rig and insert sonde into assembly housing.
- When the drill rig is properly set up and anchored, and drilling fluids mixed, the pilot bore can be initiated.
- The pilot bore will be drilled along the planned alignment from entry to exit.
- The drill head will be tracked by monitoring an electromagnetic signal sent from the transmitter mounted in the drill head to the surface enabling the steering engineer to check this real-time data and adjust the drill head as the bore progresses.
- At the completion of the pilot bore, the assembly will be removed in preparation for reaming/hole opening and an exit pit fluid/solids containment pit will be excavated with a mechanical excavator or vacuum excavator to design specification.

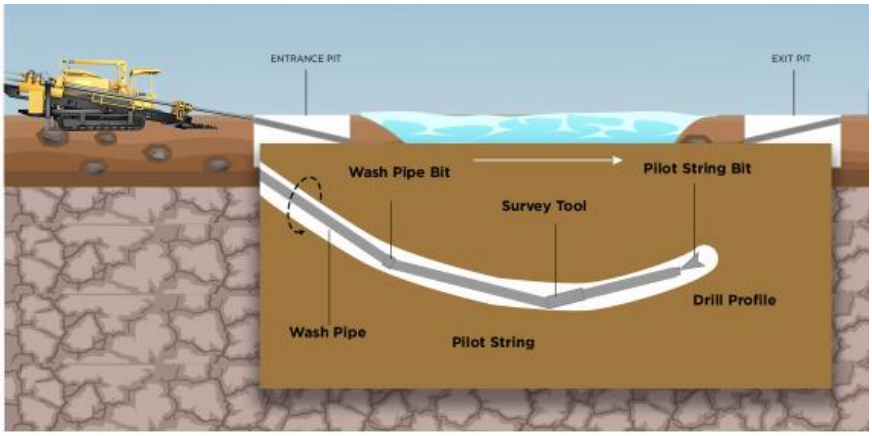

Figure 4 – Pilot hole phase

REAMING

A reaming/hole opening bit will be attached to the drill pipe and the drill pipe is pressurized to ensure the jets are open. The reamer is then rotated and pulled back through the pilot bore to enlarge the bore in one or more reaming passes.

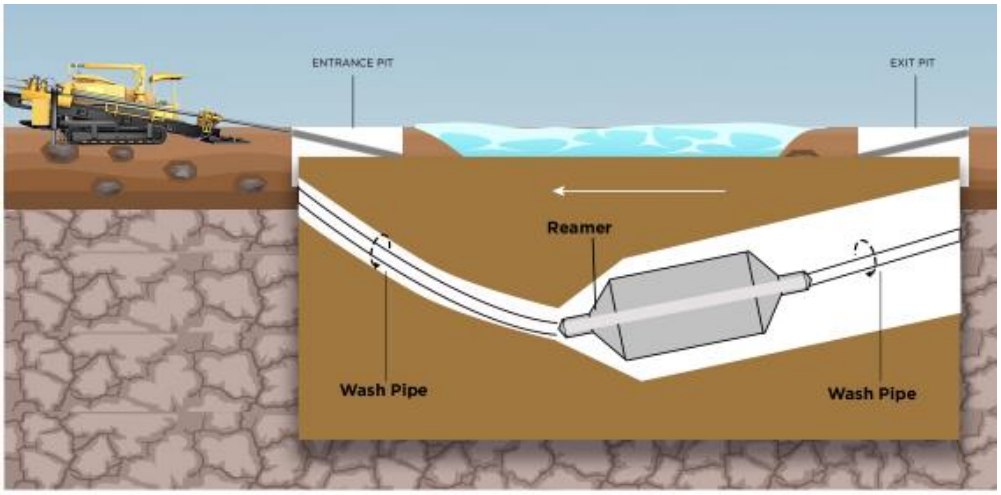

Figure 5 – Reaming phase

PULLBACK

After fabrication and pre-installation of ducts, the ducts are prepared for pullback. The pull-back operation involves pulling the entire ducting lengths in one segment back through the drilling mud along the reamed-hole pathway.

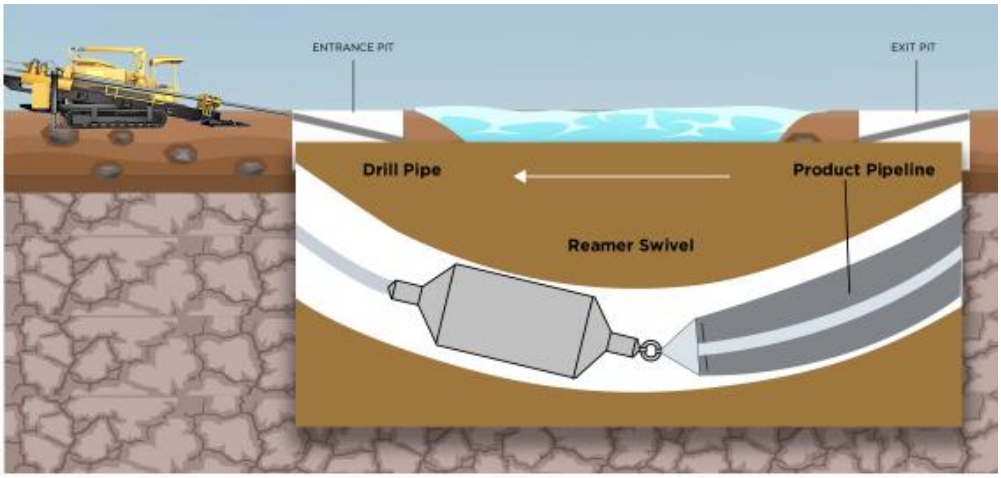

Figure 6 – Reaming phase

AS-LAID INFORMATION

Data from pilot bore and GNSS survey to be undertaken for every bore recording depth, coordinates and any other information deemed relevant for the purposes of future location.

DEMOBILISATION

After the ducts are installed, the drill site will be reinstated as required. All drilling plant shall be removed from site.

4.7 ENVIRONMENTAL SITE RISK

4.7.1 LOSS OF DRILLING FLUSH OR ESCAPE OF DRILLING FLUID TO THE SURFACE

The main environmental risk regarding a HDD operation is hydro fracture. A hydro fracture or 'frac-out' is the unintentional return of drilling fluids to the surface during HDD. A frac-out occurs when the down hole mud pressure exceeds the overburden pressure (i.e. shallow or loose sections of the bore), or the fluid finds a preferential seepage pathway.
Drilling fluid is comprised primarily of water and approximately 1 to 3% bentonite, a naturally occurring clay mineral, so it is, in most circumstances, a non-toxic, benign fluid (except when suspended within a water body and it can harm ecology).

MITIGATING BREAKOUT RISK OF DRILLING FLUIDS

Frac-out risk monitoring starts at the planning stage. Bores have to be designed to create as large a radius of curvature as possible within the limits of the site, pipe, and equipment.
This design is important in that it will allow the mud returns to flow back to the exit pit and entry pit.
The geological conditions that will be determined by site specific Site investigations will dictate the 3D alignment of the HDD.
The influence of geology has a major impact on the correct product selection. A fluid system must be designed based on respective geology. The correct viscosity of drilling fluid will remove cuttings from the borehole and reduce the risk of frac-out.
Pump rates & volume of fluids will be based on calculations which are derived from the anticipated ground conditions encountered and different stages of the operation. This will be continuously monitored during HDD operations and subject to change.

4.7.2 ESCAPE OF DRILLING FLUID TO THE GRIFFEN RIVER

Launching & reception pits to be of sufficient size to hold excess amount of water/drilling fluid to prevent run off during drilling, if necessary, these will be bunded or sand bagged. Due care is required when managing the drilling.

4.7.3 EXCESSIVE VIBRATIONS AT THE SURFACE

Based on the ground conditions expected and typical HDD operations, vibrations at the surface are not expected to be particularly severe in normal conditions.

4.7.4 CONTAMINATION OF GROUNDWATER SOURCES

Ground water vulnerability is classified as extreme across the site.
Given usual precautions, and good practice during design and construction, it is not anticipated that any unusual or exceptional risk of the contamination of groundwater sources exists at this site.

4.7.5 OBSTRUCTIONS TO DRILLING

Based on the mapping sources consulted and the ground conditions at the site, it is not expected that there are steel, concrete or timber piles along the proposed HDD alignments that would obstruct the progress of the HDD bore. In particular, it does not appear that there are piled structures associated with transport infrastructure along the proposed HDD alignments. However, this should be verified during detailed design.

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7.0 BIODIVERSITY; FLORA & FAUNA

7.1 INTRODUCTION

This chapter provides an assessment of the impacts of the proposed development; the provision of underground 110kV transmission line connections between the Kishoge 110kv Gas Insulated switchgear (GIS) substation and the permitted Aungierstown – Castlebagot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnell, Dublin 22 on the ecological environment, i.e. flora and fauna. It has been compiled in compliance with 2014 EIA Directive, the Planning and Development Act 2000 as amended, and the European Commission's guidance on the preparation of the EIA Report (2017), and follows the EPA EIA Report Guidelines (2022).

The development area is comprised of fields of improved grassland, recolonising bare ground, arable crops and buildings and artificial surfaces. The subject area is drained by the Griffeen River which leads to the River Liffey near Lucan. The Griffeen River will be under-passed by means of Horizontal Directional Drilling (HDD) at the Old Nangor Road Bridge, see Figure 8.1 below. This method avoids interaction with the water course and its associated ecology and aquatic environment.

The likely significant effects of the proposed development on biodiversity during both the Construction Phase, including impacts on air and water quality, on habitats, and on flora and fauna from construction activities such as earth movement, utility diversions, road resurfacing, and road realignments in addition to effects associated with the Operational Phase of the proposed development are presented here.

The methodologies used to collate information on the baseline biodiversity environment and assess the likely significant impacts of the Proposed Scheme are detailed in the following sections.

7.1.1 Legislation, Policy & Guidance

7.1.1.1 EU Habitats Directive

The "Habitats Directive" (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna) is the main legislative instrument for the protection and conservation of biodiversity within the European Union and lists certain habitats and species that must be protected within wildlife conservation areas, considered to be important at a European as well as at a national level. A "Special Conservation Area" or SAC is a designation under the Habitats Directive. The Habitats Directive sets out the protocol for the protection and management of SACs.

The Directive sets out key elements of the system of protection including the requirement for Appropriate Assessment of plans and projects.

7.1.1.2 EU Birds Directive

The "Birds Directive" (Council Directive 79/409/EEC amended by Council Directive 2009/147/EC on the Conservation of Wild Birds) provides for a network of sites in all member states to protect birds at their breeding, feeding, roosting and wintering areas. This Birds Directive identifies species that are rare, in danger of extinction or vulnerable to changes in habitat and which need protection (Annex I species). Appendix I indicates

Annex I bird species as listed on the Birds Directive. A “Special Protection Area” or SPA, is a designation under The Birds Directive.

Special Areas of Conservation and Special Protection Areas form a pan-European network of protected sites known as Natura 2000 sites and any plan or project that has the potential to impact upon a Natura 2000 site requires appropriate assessment.

7.1.1.3 Wildlife Acts (1976 - 2021)

The primary legislation providing for the protection of wildlife in general, and the control of some activities adversely impacting upon wildlife is the Wildlife Act 1976, as amended. The aims of the wildlife act according to the National Parks and Wildlife Service are “... to provide for the protection and conservation of wild fauna and flora, to conserve a representative sample of important ecosystems, to provide for the development and protection of game resources and to regulate their exploitation, and to provide the services necessary to accomplish such aims.” All bird species are protected under the Wildlife Act 1976. The Wildlife (Amendment) Act 2000 was amended improve the effectiveness of the Wildlife Act 1976 to achieve its aims.

7.1.1.4 Birds and Natural Habitats Regulations

The European Communities (Birds and Natural Habitats) Regulations 2011 are also a key piece of legislation (S.I. No. 477/2011) included in the Planning and Development Acts containing legal direction on the protection of flora and fauna . The Planning and Development Acts also incorporates the AA requirements into the planning regime.

The Habitats Directive and the Birds Directive have been transposed into Irish law by Part XAB of the Planning and Development Acts and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended.

7.2 METHODOLOGY

This chapter of the EIAR concentrates on ecological features within the development area of particular significance, primarily designated habitats and species. This includes habitats/species listed in Annex I, II and IV of the EU Habitats Directive, rare plants listed in the Flora Protection Order and other semi-natural habitats of conservation value.

Desktop research to determine existing records in relation to habitats and species present in the study areas was firstly undertaken. This included research on the National Parks and Wildlife Services (NPWS) metadata website, the National Biodiversity Data Centre (NBDC) database and a literature review of published information on flora and fauna occurring in the Proposed Scheme study areas.

This included research on the National Parks and Wildlife Service (NPWS) metadata website, the National Biodiversity Data Centre (NBDC) database and a data review of published information where available on flora and fauna occurring in the proposed development area (sources listed at the end of this section).

Other environmental information for the area was reviewed, e.g. in relation to soils, geology, hydrogeology and hydrology (Chapter 7 and Chapter 8 of this EIAR). Interactions in terms of the Chapters on these topics presented in this EIAR were important in the determination of source vector pathways and links with potentially hydrologically connected areas outside the proposed development site.

The potential effects on European sites are assessed in this chapter of the EIAR in relation to the requirements of the EIA Directive and Irish legislation and does not purport to comprise information for the purposes of the screening assessment to be carried out by the competent authority or authorities pursuant to Article 6(3) of the Habitats Directive. The obligation to undertake appropriate assessment derives from Article 6(3) of the Habitats Directive, and is the subject of an Appropriate Assessment Screening Report.

7.2.1 Study Area

While the main focus of biodiversity was on the proposed development site within the red line boundary, the surrounding environment was taken into account in terms of biological and hydrological connectivity, particularly in relation to European sites. The Department of Housing Planning and Local Government (previously DoEHLG) Guidance on Appropriate Assessment (2009) recommends an assessment of European sites within a potential Zone of Influence. The zone of influence has been identified taking consideration of the nature and location of the Proposed Scheme to ensure all European sites with connectivity to it are considered in terms of a catchment-based assessment.

The ecological surveys were designed based upon the characteristics of the proposed development and its likely significant impacts on the baseline environment during construction and/or operation. The study areas are described as follows:

Habitats

The area within or immediately adjacent to the proposed development footprint where habitats could be directly or indirectly affected during construction/operation.

Rare and/or Protected Flora

The area within or immediately adjacent to the proposed development footprint where rare and/or protected flora could be directly or indirectly affected during construction/operation.

Fauna species other than those listed below (includes badger, otter, other protected mammal species, amphibians, and reptiles)

The area within or immediately adjacent to the proposed development footprint where fauna species could be directly or indirectly affected during construction/operation.

Bats

The area suitable for roosting, foraging and/or commuting bats (e.g. bridges, hedgerows, treelines, woodland and/or watercourses) within or immediately adjacent to the proposed development footprint where bats could be directly or indirectly affected during construction/operation.

Wintering Birds

The area suitable for wintering birds within or immediately adjacent to the proposed development footprint where wintering birds could be directly affected during construction/operation.

The study area of this assessment is detailed below and shown on Figure 8.1.

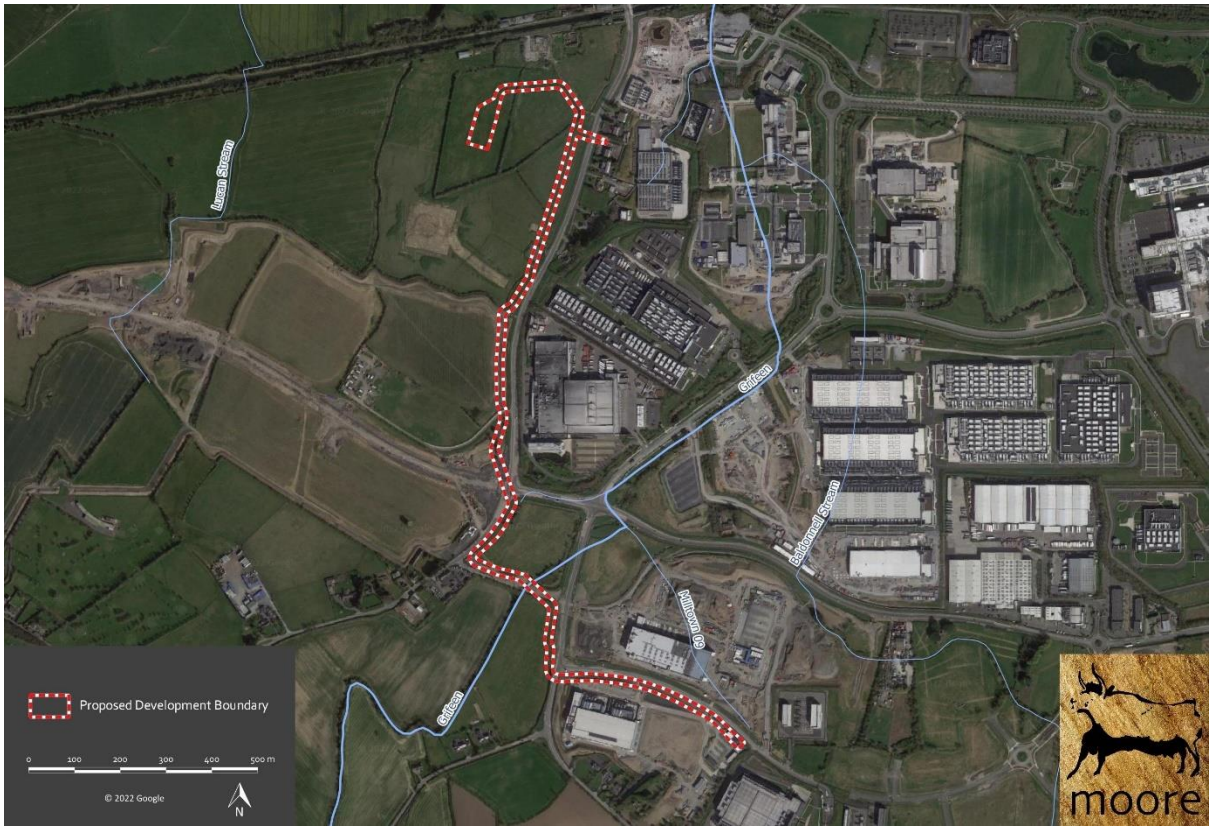

Figure 0.1 *Detail of proposed route and redline boundary at Grange Castle.*

7.2.2 Ecology Surveys

7.2.2.1 Habitat Surveys

The habitat survey was carried out in two stages. The first stage comprised desktop research to determine existing records in relation to habitats and species present in the study area as defined by the area of the proposed development, site boundaries and surrounding buffer zones up to 150 m away.

The second stage of the survey involved site visits to establish the existing environment in the footprint of the proposed development area. Areas which were highlighted during desktop assessment were investigated in closer detail according to the Heritage Council Best Practice Guidance for Habitat Survey and Mapping (Smith *et al*., 2011). Habitats in the proposed development area were classified according to the Heritage Council publication "A Guide to Habitats in Ireland" (Fossitt, 2000). This publication sets out a standard scheme for identifying, describing and classifying wildlife habitats in Ireland. This form of classification uses codes to classify different habitats based on the plant species present. Species recorded in this report are given in both their Latin and English names. Latin names for plant species follow the nomenclature of "An Irish Flora" (Parnell & Curtis, 2012).

Habitats were surveyed on 10 February, 3 March and 5 July 2022 by conducting a study area walkover covering the main ecological areas identified in the desktop assessment. The survey dates are appropriate for surveying flora, birds and non-volant

mammals such as badgers and otters. A photographic record was made of features of interest.

The key ecological receptors were determined from desktop review of draft plans to be potential effects on water quality of the Griffeen River species including White-clawed crayfish, salmonids and Otter.

It may be noted that while the presence of the White-clawed crayfish recorded in the Griffeen River by the NPWS, the proposed methodology of HDD negated the requirement to survey the river for crayfish which requires a licence from the NPWS.

The latest survey date was undertaken while meeting the local NPWS Ranger on site to discuss details of the HDD methodology and implications for wildlife, specifically otters.

7.2.2.2 Mammals (Excluding Bats)

Signs of mammals such as badgers and otters were searched for while surveying the study area noting any sights, signs or any activity in the vicinity especially along adjacent boundaries and along the course of the Griffeen River upstream and downstream of the proposed crossing point.

7.2.2.3 Bats

A desktop assessment of the suitability of the site for usage by bats was undertaken. The proposed development is predominantly and underground development and there will be no loos or interruption to commuting landscape features such as a hedgerows and it was determined by the ecologist that given the limited change in the existing habitats at the design stage, a bat detector survey was not necessary to inform the assessment process.

7.2.2.4 Breeding Birds

Breeding Birds were surveyed using standard transect methodology and signs were recorded where encountered during the field walkover survey.

A desk study was carried out to identify any potential suitable inland feeding and / or roosting sites for winter birds located within or directly adjacent to the proposed development areas.

Field surveys carried out in the proposed development area deemed the lands to be unsuitable feeding and/or roosting sites for wintering birds, due to habitat conditions being dominated by mosaics of bare ground and artificial surfaces and/or subject to high levels of disturbance. As such it was not deemed necessary to carry out detailed wintering bird surveys in these areas. The results of the desk-based study have informed the assessment of potential impacts on wintering bird species arising from the proposed development.

7.2.3 Categorisation of the Baseline Environment

Desktop research to determine existing records in relation to habitats and species present in the study areas included research on the National Parks and Wildlife Services (NPWS) metadata website, and the National Biodiversity Data Centre (NBDC) database. The following resources assisted in the production of this chapter of the report.

- The following mapping and Geographical Information Systems (GIS) data sources, as required:
    - National Parks & Wildlife (NPWS) protected site boundary data;
    - Ordnance Survey of Ireland (OSI) mapping and aerial photography;
    - OSI/Environmental Protection Agency (EPA) rivers and streams, and catchments;
    - Open Street Maps;
    - Digital Elevation Model over Europe (EU-DEM);
    - Google Earth and Bing aerial photography 1995-2022;
- Online data available on Natura 2000 sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie including:
    - Natura 2000 - Standard Data Form;
    - Conservation Objectives;
    - Site Synopses;
- National Biodiversity Data Centre records:
    - Online database of rare, threatened and protected species;
    - Publicly accessible biodiversity datasets.
- Status of EU Protected Habitats in Ireland. (National Parks & Wildlife Service, 2019) ; and
- Relevant Development Plans;
- South Dublin County Development Plan 2016-2022
- Draft South Dublin County Development Plan 2022-2028

7.2.4 Assessment Methodology

Following desktop assessment and fieldwork, an evaluation of the development area and determination of the potential effects on the flora and fauna of the area is based on the following guidelines and publications:

- Assessment of plans and projects significantly affecting Natura 2000 sites (EC, 2002);
- Managing Natura 2000 Sites (EC, 2018);
- Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC (EC, 2007);
- Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (EC, 2021);
- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG, December 2009, Rev 2010);
- EPA Guidelines on Information to be contained in an EIAR (EPA, 2022);
- Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011);
- Ecological Surveying Techniques for Protected Flora & Fauna (NRA, 2008);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009);
- Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2019).

7.3 RECEIVING ENVIRONMENT

The proposed development site essentially comprises the developed areas of the existing Grange Castle Business Park, intervening improved grassland and roads and artificial surfaces.

The following sections provide a description of the flora and fauna of the existing environment in the study area.

7.3.1 Zone of Influence

The ZoI, or distance over which a likely significant effect may occur will differ across the subject ecological receptors, depending on the predicted impacts and the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken have established the habitats and species present along the proposed development. The ZoI is then informed and defined by the sensitivities of each of the ecological receptors present, in conjunction with the nature and potential impacts associated with the proposed development. In some instances, the ZoI extends beyond the study area (e.g. surface water quality effects of a sufficient magnitude can extend, and affect, receptors at significant distances downstream).

The ZoI of the proposed development in relation to terrestrial habitats is generally limited to the footprint of the proposed development and the immediate environs (to take account of shading or other indirect impacts, such as air quality). Hydrogeological / hydrological linkages (e.g. rivers or groundwater flows) between impact sources and wetland / aquatic habitats can often result in impacts occurring at significant distances.

The unmitigated hydrogeological ZoI for the proposed development is variable depending on the nature of the proposed works at specific locations and the receiving environment ground conditions, this is deemed not to extend beyond the proposed development boundary and is discussed with reference to specific construction activities in Chapter 5 (Land, Soils, Geology & Hydrogeology).

The ZoI of air quality effects is generally local to the proposed development and not greater than a distance of 50m from the proposed development boundary, and 500m from Construction Compound during the Construction Phase, and up to 200m the Proposed Scheme boundary during the Operational Phase (refer to Chapter 8 (Air Quality) for more detail).

With regards to hydrological impacts, the distances over which water-borne pollutants are likely to remain in sufficient concentrations to have a likely significant effect on receiving waters and associated wetland / terrestrial habitat is highly site-specific and related to the predicted magnitude of any potential pollution event. It would depend on volumes of discharged waters, concentrations and types of pollutants (e.g. sediment and/or hydrocarbons), volumes of receiving waters, and the ecological sensitivity of the receiving waters. In the case of the proposed development, connectivity to the receiving environment of the Griffeen River has been avoided by HDD methodology.

The ZoI for impacts to aquatic fauna species, such as Salmonids, is limited to those water courses that may be crossed by the proposed development or water bodies to which runoff from the proposed development could drain to during construction.

The ZoI of the proposed development in relation to likely significant effects on most breeding bird species is generally limited to habitat loss within the footprint of the proposed development, and disturbance / displacement during construction and disruption in territorial singing due to noise during operation.

7.3.2 Designated Conservation Areas

A Zone of Influence (ZoI) of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant

effects on the Qualifying Interests of a European site. In accordance with the OPR Practice Note, PN01, the ZoI should be established on a case-by-case basis using the Source- Pathway-Receptor framework.

The Zone of Influence may be determined by connectivity to the Proposed Development in terms of:

- Nature, scale, timing and duration of works and possible impacts, nature and size of excavations, storage of materials, flat/sloping sites;
- Distance and nature of pathways (dilution and dispersion; intervening 'buffer' lands, roads etc.); and
- Sensitivity and location of ecological features.

The potential for source pathway receptor connectivity is firstly identified through GIS interrogation and detailed information is then provided on sites with connectivity. European sites that are located within a potential Zone of Influence of the Proposed Development are presented in Figure 8.2 below. Spatial boundary data on the Natura 2000 network was extracted from the NPWS website (www.npws.ie) on 29 July 2022. This data was interrogated using GIS analysis to provide mapping, distances, locations and pathways to all sites of conservation concern including pNHAs, NHA and European sites.

The nearest European site to the Proposed Development is the Rye Water Valley/Carton SAC (Site Code 001398), approximately 4.3km to the northwest. There is no hydrological connectivity to this site.

The Proposed Development is located within the hydrological catchment of the River Liffey, and involves drilling below the Griffeen River, a tributary of the River Liffey. Downstream, the waters of the River Liffey enters Dublin Bay with its European sites. There is no connectivity to these or any European sites.

NHAs are designations under Section 16 of the Wildlife Acts to protect habitats, species or geology of national importance.

In addition to NHAs, there are pNHAs which are also sites of significance for wildlife and habitats and were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. pNHAs are offered protection in the interim period under the county or city development plans which requires that planning authorities give due regard to their protection in planning policies and decisions.

With the exception of one site, the pNHA sites in the ZoI of the proposed development overlap with the boundaries of European sites and as such are considered under this higher-level conservation status. The only other pNHA associated with the receiving environment of the Griffeen River is the Liffey Valley pNHA (Site code 000128).

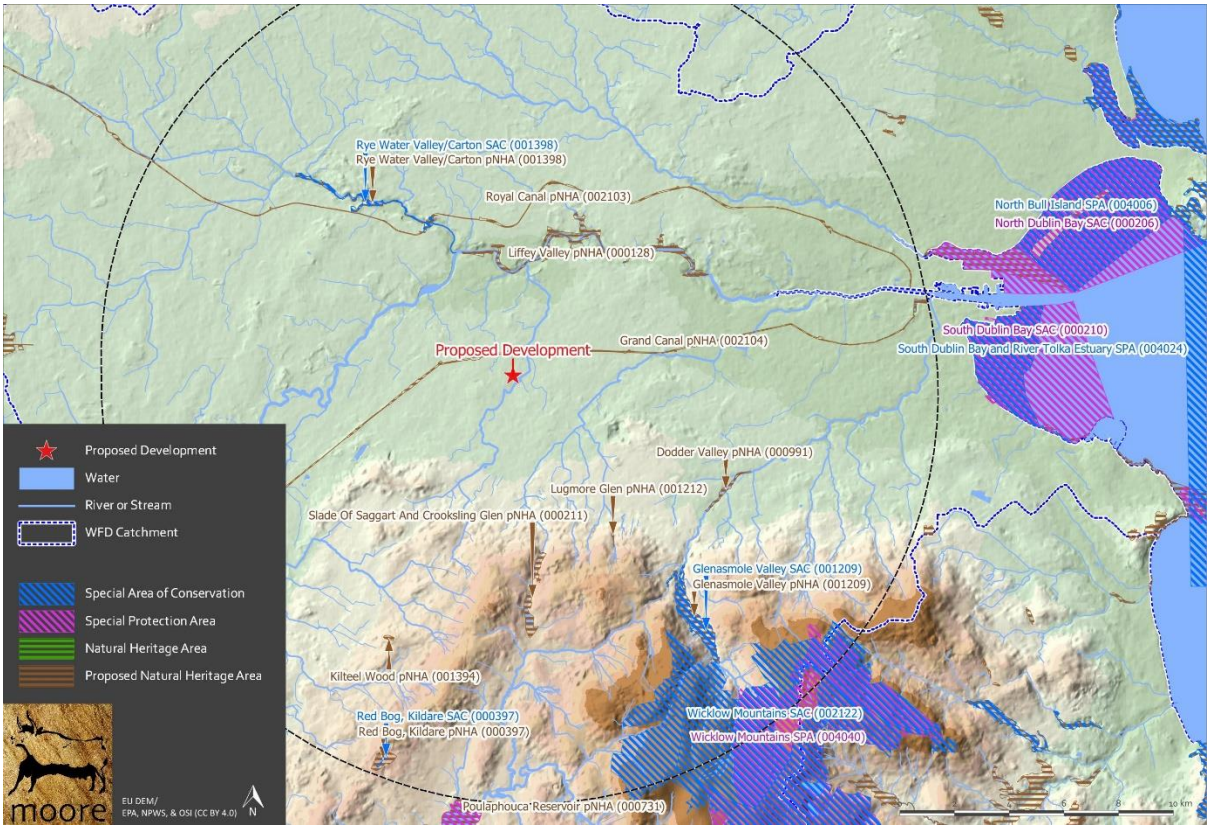

Figure 0.2 *Detail of site Location in relation to nearby designated sites.*

7.3.3 Habitats, Flora & Fauna

In general, there are few natural habitats in the proposed development areas. They have either been modified or are artificial in nature the urban context of the light industrial areas of the existing Grange Castle Business Park. The main natural habitats of conservation concern are the Griffeen River. Habitats are classified under the Fossitt codes (Fossitt, 2000).

The following is an overview of the main habitat types present in proposed works areas. Detailed habitat descriptions are provided in areas that either intersect or have hydrological connectivity with European sites, see Figure 8.3.

The main habitats are presented on the recent aerial photography (April 2021) in Figure 8.3. A list of habitats recorded and their corresponding Fossitt codes is presented in Table 8.1.

Table 0.1 *Details of habitats recorded and their corresponding Fossitt codes.*

Habitat	Habitat Category	Habitat Type
(W) Freshwater	(FW) Watercourses	(FW1) Griffeen River
(G) Grassland	(GA) Improved grassland	(GA1) Improved agricultural grassland
(W) Woodland and Scrub	(WD) Highly modified/non-native woodland	(WD1) Mixed broad leved woodland
	(WL) Linear woodland	(WL1) Hedgerows
(E) Exposed rock and disturbed ground	(ED) Disturbed ground	(ED3) Recolonising bare ground
(B) Cultivated and built land	(BC) Cultivated land	(BC1) Arable crops
	(BC) Built land	(BL3) Buildings and artificial surfaces

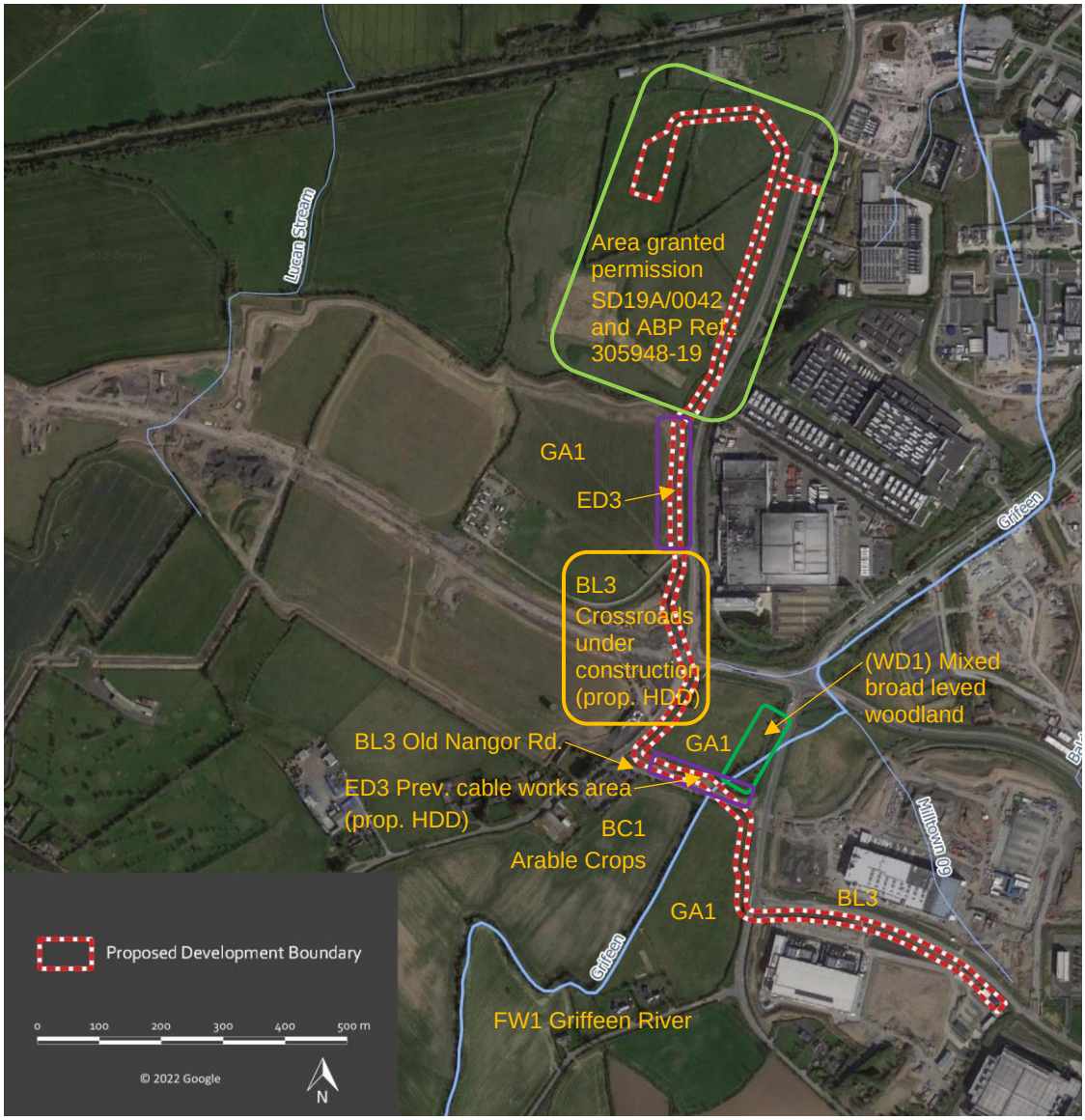

Figure 0.3 *Habitats recorded in the proposed development areas.*

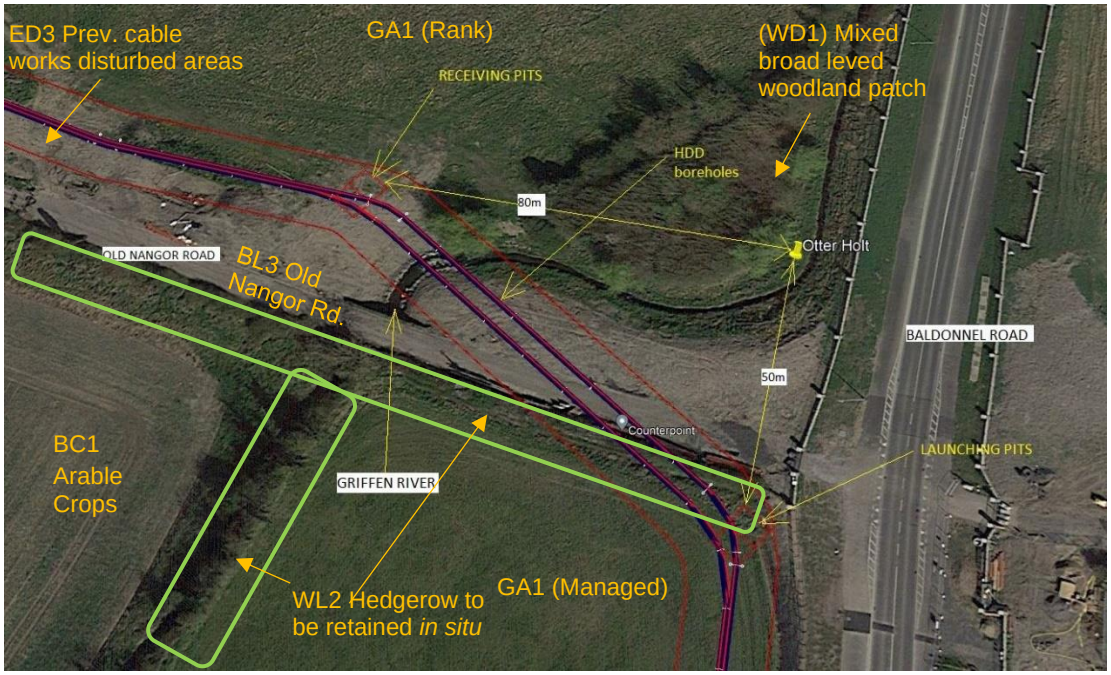

Figure 0.4a *Detail of Habitats recorded in the proposed Griffeen River crossing area (April 2021) showing the proposed engineering drawing overlay of the proposed HDD methodology.*

7.3.3.1 (GA1) Improved grassland

This habitat refers to the areas of the proposed route which comprises both former farmed and existing managed agricultural grassland. Species present include Cocks foot (*Dactylis glomerata*), Bent (*Agrostis* spp.), Meadow grass (*Poa* spp.) and abundant False Oat-grass (*Arrhenatherum elatius*). Ribwort plantain (*Plantago lanceolata*), Creeping buttercup (*Ranunculus repens*), Daisy (*Bellis perennis*), along with Dandelion (*Taraxacum* spp.), Common Vetch (*Vicia sativa* agg.) and Common Mouse-ear (*Cerastium fontanum ssp. vulgare*) are all common. The majority of the grassland areas are managed either by SDCC or the landowners with the exception of the filed to the north of the Old Nangor Rd through which the Griffeen River flows. The grass sward is unmanaged in this field and outgrown forming a rank mat in the Winter.

The southwestern filed margin merges with previously disturbed working areas for a prior cable insertion as recently as April 2021. The disturbed areas have recolonised with ruderal species described in that habitat category below.

Occasional Gorse bushes (*Ulex europaeus*) are present on the south side of the newly developed Grange Castle west intersection with occasional Curled dock (*Rumex crispus*) present in this field.

7.3.3.2 (FW1) Griffeen River

This habitat refers to the course of the Griffeen River through the unmanaged grassland to the north of the Old Nangor Road. The river flows under an old stone arch bridge, now defunct as the road has been closed off and superseded by the new network of Grange Castle Business Park roads. Upstream of the bridge, the river flows along its original path with Arable land to the west sown with Potatoes (Summer 2022) and managed Improved grassland to the east. Species present include frequent grasses Cocks foot (*Dactylis glomerata*) and abundant False Oat-grass (*Arrhenatherum elatius*). Tall herbs dominate the downstream side where previous works involving a stream crossing have colonised disturbed and re-landscaped areas,

including Great willow herb (Epilobium hirsutum), Meadowsweet (*Filipendula ulmaria*) and Meadow buttercup (*Ranunculus acris*) with instream species including Common figwort (*Scrophularia nodosa*) and Fools watercress (*Apium nodiflorum*).

7.3.3.3 (WD1) Mixed broad leved woodland

There is a landscaped planted embankment downstream of the Old Nangor Road to the north and east of the proposed crossing of the river comprising Weeping willow (*Salix babylonica*), Birch (*Betula* pubescens), Willow (*Salix* spp.), Ash (*Fraxinus excelsior*), Hawthorn (*Crataegus monogyna*), Pine (*Pinus* spp.), Blackthorn (*Prunus spinosa*) and Dogwood (*Cornus* spp.). The understorey has limited flora with Bramble (*Rubus fruticosus* agg.) most frequent along with Great willowherb (*Epilobium hirsutum*) and Creeping buttercup (*Ranunculus repens*).

7.3.3.4 (WL1) Hedgerow

This habitat refers the boundary between the fields to the south of the Old Nangor Rd. and footprint area of the proposed cable route and HDD crossing of the Griffeen River. The predominant species present is Hawthorn with frequent Gorse, Alder (*Alnus glutinosa*), Blackthorn (*Prunus spinosa*) and Willow (*Salix* spp) along with stunted Field Maple (*Acer campestre*). The understory has the same species listed as the woodland habitat listed above with occasional records of the recolonising ground listed below. In addition, Common knapweed (*Centaurea nigra*) and Cleavers (G*alium aparine*) are common.

7.3.3.5 (ED3) Recolonising ground

This habitat refers to previously disturbed areas where spoil and bare ground has recolonised and the species composition reflects the recolonisation of the spoil over time. Species present includes abundant Rapeseed (*Brassica napus subsp. napus*), Common ramping fumitory (*Fumaria muralis*), Ragwort, (*Senecio jacobaea*), Broadleaved Dock (*Rumex obtusifolius*), Dandelion (*Taraxacum officinale* agg.), Nettle (*Urtica dioica*), Thistles (*Cirsium* spp.), Creeping buttercup, Clovers (*Trifolium* spp.), Lesser burdock (*Arctium minus*), Ribwort plantain (*Plantago lanceolata*) and occasional Coltsfoot (*Tussilago farfara*) and abundant Yarrow (*Achillea millefolium*).

7.3.4 Invasive Species

There were no invasive species recorded during the habitat surveys.

7.3.5 Fauna

7.3.5.1 Badgers

There were no badger setts along field boundaries which would be disturbed and no signs of badgers in the study area.

7.3.5.2 Otters

A single otter holt was recorded on the north side of the Old Nangor Road stone bridge. The coordinates are not presented to protect the location but were recorded by the local NPWS Wildlife Ranger during the July site survey. It is likely that otters commute along the Griffeen River outside the survey area.

7.3.5.3 Bats

A search of the wider area including the Grand Canal to the north of Grange Castle Business Park returns records for Brown Long-eared Bat (*Plecotus auritus*), Daubenton's Bat (*Myotis daubentonii*), Leisler's Bat (*Nyctalus leisleri*), Common Pipistrelle (*Pipistrellus pipistrellus sensu lato*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*). With the exception of Brown-long-eared Bats, these species are commonly occurring species in the area of the Grand Canal while Daubenton's Bats prefer to feed over open water ways such as canals and slow moving rivers.

There are no mature trees to be removed and no bat roosts to be disturbed.

Species recorded included regular passerines such as Great Tit (*Parus major*), Chaffinch (*Fringilla coelebs*), Blackbird (*Turdus merula*), Wren (*Troglodytes troglodytes*). Buzzards were seen flying over the survey area and are a common sight in this area of west Dublin.

A list of breeding bird species recorded during fieldwork in March and July 2022 is presented in Table 8.2.

Table 0.2 *Details of birds encountered during fieldwork.*

Birds	Scientific name	BWI Status	Habitat Type
Blackbird	*Turdus merula*	Green	Dense woodland to open moorland, common in gardens
Chaffinch	*Fringilla coelebs*	Green	Hedgerows, gardens and farmland
Magpie	*Pica*	Green	Farmland, open country with scattered trees or bushes, increasingly in urban areas
Woodpigeon	*Columba palumbus*	Green	Gardens, woods, hedges
Wren	*Troglodytes*	Green	Low cover anywhere, especially woodlands

7.3.6 Habitat Evaluation

The ecological value of the site was assessed following the guidelines set out in the Institute of Ecology and Environmental Management's Guidelines for Ecological Impact Assessment (2019) and according to the Natura Scheme for evaluating ecological sites (after Nairn & Fossitt, 2004) in the TII Guidelines (formerly NRA) for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009) which outlines the methodology for evaluating ecological impacts Judgements on the evaluation were made using geographic frames of reference, e.g. European, National, Regional or Local outlined as follows:

Ecological valuation: Examples

International Importance:

- 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
- Site that fulfills the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
- Features essential to maintaining the coherence of the Natura 2000 Network.
- Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.

- Resident or regularly occurring populations (assessed to be important at the national level) of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
- Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
- World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
- Biosphere Reserve (UNESCO Man & The Biosphere Programme).
- Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
- Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
- Biogenetic Reserve under the Council of Europe.
- European Diploma Site under the Council of Europe.
- Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).

National Importance:

- Site designated or proposed as a Natural Heritage Area (NHA).
- Statutory Nature Reserve.
- Refuge for Fauna and Flora protected under the Wildlife Acts.
- National Park.
- Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA);
- Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
- Resident or regularly occurring populations (assessed to be important at the national level) of the following:
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Site containing ‘viable areas’ of the habitat types listed in Annex I of the Habitats Directive County Importance:
- Area of Special Amenity.
- Area subject to a Tree Preservation Order.
- Area of High Amenity, or equivalent, designated under the County Development Plan.
- Resident or regularly occurring populations (assessed to be important at the County level) of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.

- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):

- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
- Resident or regularly occurring populations (assessed to be important at the Local level) of the following:
  - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value):

- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;
- Sites or features containing non-native species that are of some importance in maintaining habitat links.

Due cognisance of features of the landscape which are of major importance for wild flora and fauna, such as those with a "*stepping stone*" and ecological corridors function, as referenced in Article 10 of the Habitats Directive were considered in this assessment.

The Griffeen River leads to the River Liffey c. 5.5 river km downstream of the site boundary and discharges to the sea at Dublin Bay over 25 river km downstream of the site boundary.

The Griffeen River holds stocks of Salmonids, is known to have White clawed crayfish present and supports otters, both latter species protected under European law considered of high biodiversity value at a local level. However, the proposed methodology of crossing the river by means of HDD will avoid interaction with the otter habitat and avoids potential issues with water quality.

The footprint habitats are considered of relatively low biodiversity value at a local level. The landscaped mixed broadleaved woodland and hedgerows are considered of high biodiversity value at a local level.

7.4 CHARACTERISTICS OF THE DEVELOPMENT

The proposed development consists of provision of underground 110kV transmission line connections between the Kishoge 110kv Gas Insulated switchgear (GIS) substation on a site within the townland of Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin, and the permitted Aungierstown – Castlebaggot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnel, Dublin 22. The proposed transmission lines provide for a loop-in connection to the permitted Aungierstgown – Castlebaggot transmission line.

The permitted Kishoge substation works (permitted under South Dublin County Council Reg. Ref.: SD19A/0042 and ABP Ref.: 305948-19 – Extant permission for substation and data storage facility development) is scheduled to commence construction in late Q 2 of 2022.

To avoid potential negative effects on the otter holt located at the North bank of Griffeen river, the proposed launching and receiving pits of the Horizontal Direct Drill (HDD) will be positioned min. 50m from its location.

The HDD methodology (prepared by the project Engineers July 2022) under Griffeen River is provided with planning.

A full description of the proposed development is provided in Chapter 2 (Description of the Proposed Development).

7.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

7.5.1 Construction Phase

7.5.1.1 Habitats

There will be a permanent minor loss of improved grassland and recolonised ground. The potential effects on local ecology are ***neutral*** and ***imperceptible*** for the construction phase.

There will be no effect on the adjacent landscaped woodland area at the Griffeen River Crossing or on the Hedgerows along the Old Nangor Road or Griffeen River upstream of the Old Nangor Rd. stone bridge.

The HDD methodology includes design measures with setback areas of proposed construction works which will avoid habitat disturbance or surface water runoff to the Griffeen River.

There will be no direct or indirect effects on the water quality of the Griffeen River.

There are no pathways from the development areas to the Griffeen River which leads to the River Liffey and Dublin Bay. There are no predicted effects from the construction phase on the Griffeen River, the River Liffey or on Dublin Bay.

7.5.1.2 Fauna

Badgers

There were no badger setts along field boundaries which would be disturbed and no signs of badgers in the study area. There is no potential for effects on badgers.

Otters

The proposed methodology of crossing the river by means of HDD will avoid interaction with the otter habitat at the Old Nangor Rd. bridge and avoids potential issues with water quality. The launch and reception pits have been designed to be set back a minimum distance from the location of the otter hold and this will avoid disturbance to the otter habitats and otters themselves. There is no potential for effects on otters.

Bats

There will be no loss of bat roosts or bat commuting habitat. The potential effect on bats is ***neutral*** and ***imperceptible*** for the construction phase.

Birds

Potential effects on nesting birds may occur as a result of vegetation cutting. The potential effects on local bird populations is ***not significant*** and can be avoided.

7.5.2 Operational Phase

7.5.2.1 Habitats

There are no pathways from the development areas to the Griffeen River which leads to the River Liffey and Dublin Bay. There are no predicted effects from the operational phase.

Fauna

Badgers

There is no potential for effects on badgers during the operational phase.

Otters

There is no potential for effects on otters or sources of food during the operational phase.

Bats

Given the relatively low potential for bat commuting on an existing light industrial site with existing level of urban light, the predicted effect on bats is not significant for he operational phase.

Birds

There is no potential for effects on birds during the operational phase.

7.6 MITIGATION MEASURES

In addition to retention of existing hedgerows where feasible, the proposed development includes a Landscape Strategy which provides for increased biodiversity through the additional planting.

The landscape strategy proposes to enhance and strengthen the existing hedgerow using native hedgerow and woodland species, while retaining the existing trees. In addition to strengthening the remnants of the existing hedgerow, planting of native hedgerow species is also proposed.

Planting along site boundaries and on disturbed ground helps create belts of native woodland spaces which act as native habitat and similarly to the native hedgerows, form ecological corridors which connect with other landscape elements throughout the site.

7.7 RESIDUAL IMPACTS OF THE DEVELOPMENT

Specific local mitigation measures include the avoidance of cutting of vegetation during the bird nesting season with regard to the construction phase. The overall effect is considered ***neutral, imperceptible, and long-term.***

With the employment of appropriate mitigation measures including landscaping incorporating natural species to improve biodiversity and maintenance of boundary hedgerows the Proposed Development will have a ***neutral, imperceptible*** and ***long-term effect*** on biodiversity.

7.8 MONITORING

No ecological monitoring is required during the construction phase of development.

7.9 CUMULATIVE IMPACTS

The cumulative impact of the proposed development with any/all relevant other planned or permitted developments (as described in Chapter 3) are discussed below.

7.9.1 Construction Phase

Permitted developments have been granted with conditions relating to sustainable development by the consenting authority, in compliance with the relevant Local Authority Development Plan and in compliance with the Local Authority requirement with regard to the Habitats Directive. The Proposed Development will also be required to meet these requirements and accordingly measures are included in the design.

A review of the National Planning Application Database was undertaken. The first stage of this review confirmed that there were no data gaps in the area where the Proposed Development is located. The database was then queried for developments granted planning permission within 500m of the Proposed Development within the last three years.

These developments have been granted permission in most cases with conditions relating to sustainable development by the consenting authority in compliance with the relevant Local Authority Development Plan and in compliance with the Local Authority requirement with regard to the Habitats Directive. The development cannot have

received planning permission without having met the consenting authority requirement in this regard.

There are no predicted in-combination effects given that it is predicted that the Proposed Development will have no significant effect on biodiversity.

During construction there will **short term, negative, imperceptible/not significant** cumulative impact on local biodiversity due to the loss of existing vegetation. There will be no cumulative impact on any European sites.

7.9.2 Operational Phase

Once operational, the landscape strategy for the project is to enhance and strengthen the existing native floral species, while retaining the existing trees remaining hedgerow As such, the landscape strategy for the Proposed Development and other permitted developments is in line with the requirements of the Local Authority Development Plan, will enhance and strengthen the existing native floral species, while retaining the existing trees.

There are no predicted in-combination effects given that it is predicted that the Proposed Development will have no longterm negative effects on Biodiversity.

The cumulative impact will be ***neutral, imperceptible*** and ***long-term effect*** on biodiversity.

7.10 REFERENCES

- CIEEM (2019) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine; September 2018; Version 1.1 - Updated September 2019. Institute of Ecology and Environmental Management.
- Department of the Environment, Heritage and Local Government (2010) Guidance on Appropriate Assessment of Plans and Projects in Ireland (as amended February 2010).
- EC (2000) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.
- EC (2018) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.
- EC (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43EEC. European Commission, Brussels.
- EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive '92/43/EEC: Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interests, compensatory measures, overall coherence and opinion of the Commission. European Commission, Brussels.
- EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. EPA, May 2022.
- Fossitt, J. (2000) A Guide to Habitats in Ireland. The Heritage Council.
- Nairn, R. and J. Fossitt (2004) The Ecological Impacts of Roads, and an Approach to their Assessment for National Road Schemes. In: J. Davenport and J.L Davenport (eds) The Effects of Human Transport on Ecosystems: Cars and Planes, Boats and Trains, 98-114. Dublin. Royal Irish Academy.

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- Parnell, J. and T. Curtis (2012) Webb's An Irish Flora. Cork University Press.
- Smith, G.F., O'Donoghue, P., O'Hora, K. and E. Delaney (2011) Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council.

APPENDIX 7.1

Appropriate Assessment Screening

Kishoge 110kV Transmission Line

Prepared by: Moore Group – Environmental Services

Report for the purposes of Appropriate Assessment Screening

Kishoge 110kV Transmission Line

Prepared by: Moore Group – Environmental Services

31 July 2022

On behalf of Edgeconnex

Project Proponent	Edgeconnex
Project	Kishoge 110kV Transmission Line
Title	Report for the purposes of Appropriate Assessment Screening Kishoge 110kV Transmission Line

Project Number	22054	**Document Ref**	22054 Kishoge 110kV TL AAS1 Rev0
Revision	**Description**	**Author**	**Date**
Rev0	Issued to Client	G. O'Donohoe	31 July 2022
Moore Archaeological and Environmental Services Limited			

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Abbreviations

AA	Appropriate Assessment
EEC	European Economic Community
EPA	Environmental Protection Agency
EU	European Union
GIS	Geographical Information System
LAP	Local Area Plan
NHA	Natural Heritage Area
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
OSI	Ordnance Survey Ireland
pNHA	proposed Natural Heritage Area
SAC	Special Area of Conservation
SPA	Special Protection Area
SuDS	Sustainable Drainage System
WFD	Water Framework Directive

1. Introduction

1.1. General Introduction

This report for the purposes of Appropriate Assessment (AA) Screening has been prepared to support a Planning Application for the Proposed Development (described in Section 3 below). This report contains information required for the competent authority to undertake screening for Appropriate Assessment (AA) in respect of the provision of underground 110kV transmission line connections between the Kishoge 110kv Gas Insulated switchgear (GIS) substation and the permitted Aungierstown – Castlebagot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnell, Dublin 22 (hereafter referred to as the Proposed Development) to determine whether it is likely individually or in combination with other plans and projects to have a significant effect on any European sites, in light of best scientific knowledge.

Having regard to the provisions of the Planning and Development Act 2000 – 2021 (the "Planning Acts") (section 177U), the purpose of a screening exercise under section 177U of the PDA 2000 is to assess, in view of best scientific knowledge, if the proposed development, individually or in combination with another plan or project is likely to have a significant effect on a European site.

If it cannot be *excluded* on the basis of objective information that the proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site then it is necessary to carry out a Stage 2 appropriate assessment under section 177V of the Planning Acts.

When screening the project, there are two possible outcomes:

- the project poses no potential for a likely significant effect and as such requires no further assessment; and
- the project has potential to have likely significant effect (or this is uncertain) unless mitigation measures are applied, and therefore an AA of the project is necessary.

This report has been prepared by Moore Group - Environmental Services to enable An Bord Pleanála to carry out AA screening in relation to the Proposed Development. The report was compiled by Ger O'Donohoe (B.Sc. Applied Aquatic Sciences (GMIT, 1993) & M.Sc. Environmental Sciences (TCD, 1999)) who has 30 years' experience in environmental impact assessment and has completed numerous Appropriate Assessment Screening Reports and Natura Impact Statements on terrestrial and aquatic habitats for various development types.

1.2. Legislative Background - The Habitats and Birds Directives

Article 6(3) and 6(4) of the Habitats Directive is transposed into Irish Law inter alia by the Part XAB of the Planning Acts (in particular section 177U and 177V) which governs the requirement to carry out appropriate assessment screening and appropriate assessment, where required, per Section 1.1 above.

The Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora) is the main legislative instrument for the protection and conservation of biodiversity in the European Union (EU). Under the Habitats Directive, Member States are obliged to designate Special Areas of Conservation (SACs) which contain habitats or species considered important for protection and conservation in a EU context.

The Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds), transposed into Irish law by the Bird and Natural Habitats Regulations 2011 as amended, and the Wildlife Act 1976, as amended, is concerned with the long-term protection and management of all wild bird species and their habitats in the EU. Among other things, the Birds Directive requires that Special Protection Areas (SPAs) be established to protect migratory species and species which are rare, vulnerable, in danger of extinction, or otherwise require special attention.

SACs designated under the Habitats Directive and SPAs, designated under the Birds Directive, form a pan-European network of protected sites known as Natura 2000. The Habitats Directive sets out a unified system for the protection and management of SACs and SPAs. These sites are also referred to as European sites.

Articles 6(3) and 6(4) of the Habitats Directive set out the requirement for an assessment of proposed plans and projects likely to have a significant effect on Natura 2000 sites.

Article 6(3) establishes the requirement to screen all plans and projects and to carry out an appropriate assessment if required (Appropriate Assessment (AA)). Article 6(4) establishes requirements in cases of imperative reasons of overriding public interest:

> ***Article 6(3):*** *"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to an appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."*

2. Methodology

The Commission's methodological guidance (EC, 2002, 2018, 2021 see Section 2.1 below) promotes a four-stage process to complete the AA and outlines the issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required.

Stages 1 and 2 deal with the main requirements for assessment under Article 6(3). Stage 3 may be part of Article 6(3) or may be a necessary precursor to Stage 4. Stage 4 is the main derogation step of Article 6(4).

Stage 1 Screening: This stage examines the likely effects of a project either alone or in combination with other projects upon a Natura 2000 site and considers whether it can be objectively concluded that these effects will not be significant. In order to screen out a project, it must be excluded, on the basis of objective information, that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on a European site.

Stage 2 Appropriate Assessment: In this stage, there is a consideration of the impact of the project with a view to ascertain whether there will be any adverse effect on the integrity of the Natura 2000 site either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are predicted impacts, an assessment of the potential mitigation of those impacts is considered.

Stage 3 Assessment of Alternative Solutions: This stage examines alternative ways of implementing the project that, where possible, avoid any adverse impacts on the integrity of the Natura 2000 site.

Stage 4 Assessment where no alternative solutions exist and where adverse impacts remain: Where imperative reasons of overriding public interest (IROPI) exist, an assessment to consider whether compensatory measures will or will not effectively offset the damage to the sites will be necessary.

To ensure that the Proposed Development complies fully with the requirements of Article 6 of the Habitats Directive and all relevant Irish transposing legislation, Moore Group compiled this report to enable An Bord Pleanála to carry out AA screening in relation to the Proposed Development to determine whether the Proposed Development, individually or in combination with another plan or project will have a significant effect on a Natura 2000 site.

2.1. Guidance

This report has been compiled in accordance with guidance contained in the following documents:

- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities. (Department of Environment, Heritage and Local Government, 2010 rev.)(soon to be superseded by EC Guidance in prep.).
- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPWS 1/10 & PSSP 2/10.
- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC (EC, 2018).
- Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (EC, 2021).
- Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EC, 2021).
- Office of the Planning Regulator (OPR) Practice Note PN01 Appropriate Assessment Screening for Development Management (OPR, 2021).

2.2. Data Sources

Sources of information that were used to collect data on the Natura 2000 network of sites, and the environment within which they are located, are listed below:

- The following mapping and Geographical Information Systems (GIS) data sources, as required:
    - National Parks & Wildlife (NPWS) protected site boundary data;
    - Ordnance Survey of Ireland (OSI) mapping and aerial photography;
    - OSI/Environmental Protection Agency (EPA) rivers and streams, and catchments;
    - Open Street Maps;
    - Digital Elevation Model over Europe (EU-DEM);
    - Google Earth and Bing aerial photography 1995-2022;
- Online data available on Natura 2000 sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie including:
    - Natura 2000 - Standard Data Form;
    - Conservation Objectives;
    - Site Synopses;
- National Biodiversity Data Centre records;
    - Online database of rare, threatened and protected species;
    - Publicly accessible biodiversity datasets.
- Status of EU Protected Habitats in Ireland. (National Parks & Wildlife Service, 2019); and
- Relevant Development Plans;
    - South Dublin County Development Plan 2016-2022
    - Draft South Dublin County Development Plan 2022-2028

3. Description of the Proposed Development

The Proposed Development consists of the construction and operation of a 110kV transmission line at Kishoge, Co. Dublin. The line extends between the Kishoge 110kV Gas Insulated switchgear (GIS) substation on a site within the townland of Ballymakaily, west of Newcastle Road (R120), Lucan, Co. Dublin, and the permitted Aungierstown – Castlebaggot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnel, Dublin 22. The proposed transmission lines provide for a loop-in connection to the permitted Aungierstgown – Castlebaggot transmission line.

The development area is comprised of improved grassland, recolonising bare ground, amenity grassland and buildings and artificial surfaces. The subject area is drained by the Griffeen River which leads to the River Liffey near Lucan. The Griffeen River will be under-passed by means of Horizontal Directional Drilling (HDD) at the Old Nangor Road Bridge, see Figure 2 below. This method avoids interaction with the water course and its associated ecology and aquatic environment.

To avoid potential impact on an otter holt located at the north bank of Griffeen river, the proposed launching and receiving pits of the HDD will be positioned min. 50m from its location. See figure 3a below.

The technique of Horizontal Directional Drilling (HDD) was selected specifically to avoid conflict with the Griffeen river, and as one of the family of civil engineering techniques known as “Trenchless Technology”, is used to install utility ducts without impact to the river. In addition, the integrity of cable ducts installed at depth, in solid geology, is considerably enhanced precluding the requirement to re-excavate at regular intervals for repair and restoration.

Figure 1 shows the Proposed Development location and Figure 2 shows a detailed view of the Proposed Development boundary on recent aerial photography. Figure 3 shows the layout of the Proposed Development.

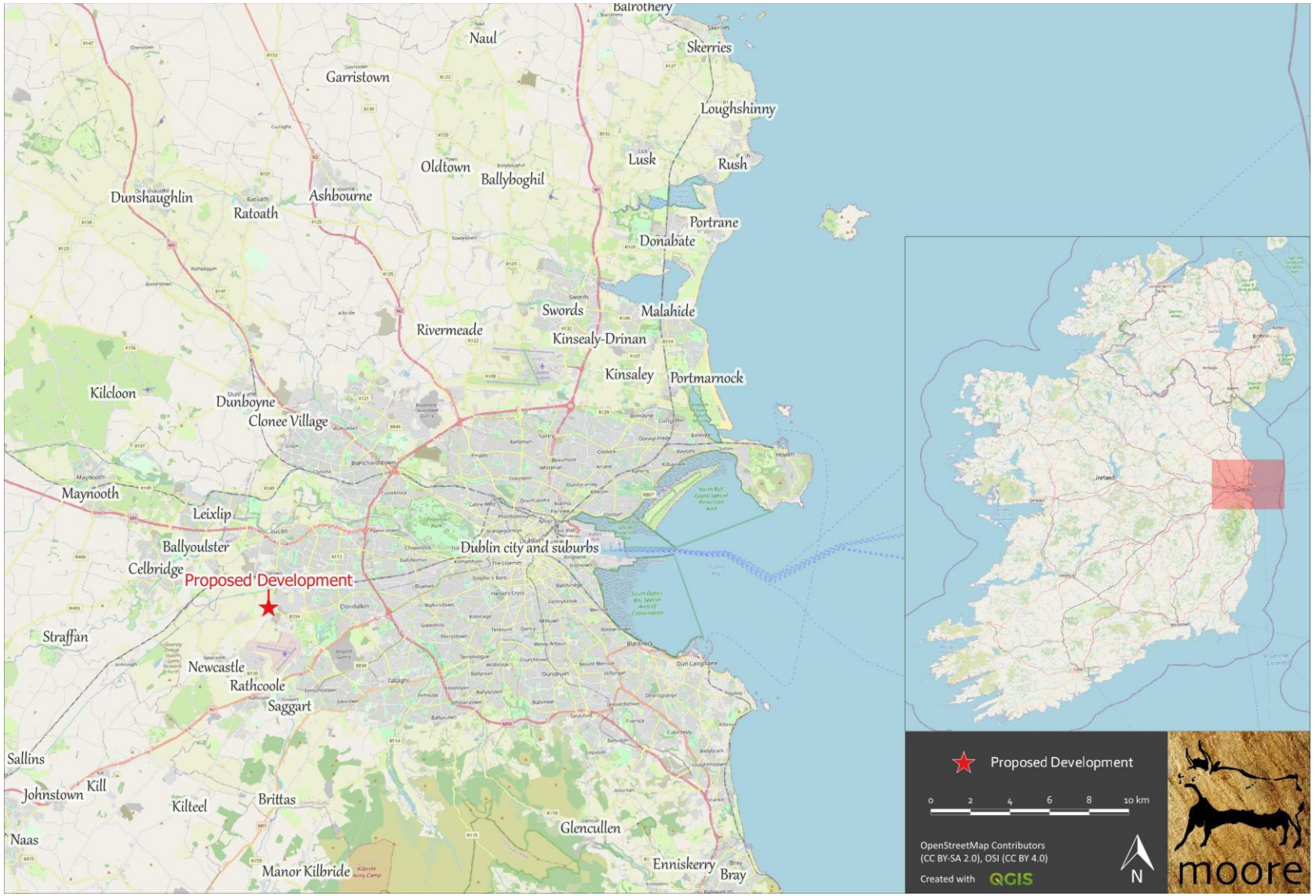

Figure 1. Showing the Proposed Development location at Grange Castle, Co. Dublin.

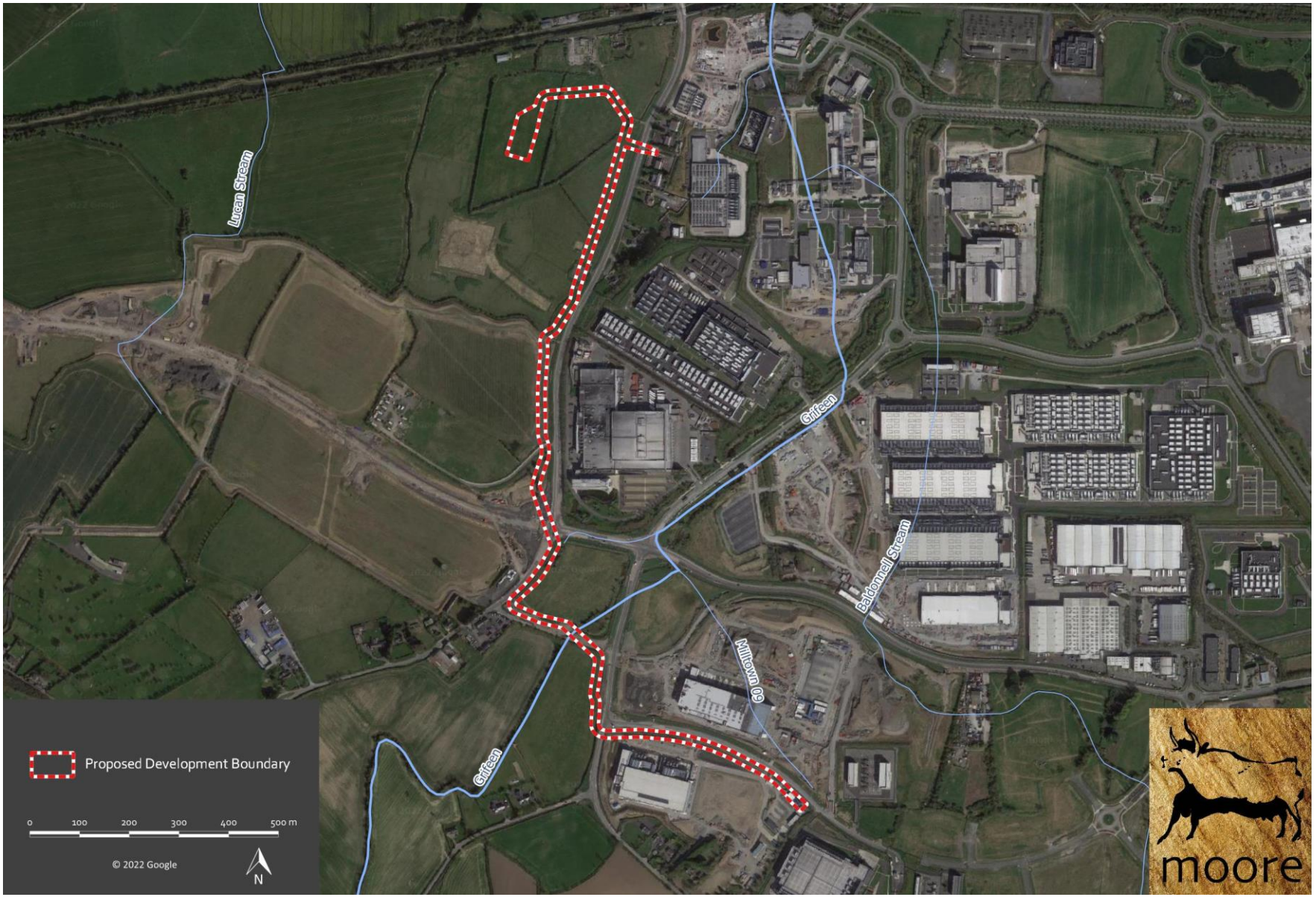

Figure 2. Showing the Proposed Development boundary on recent aerial photography.

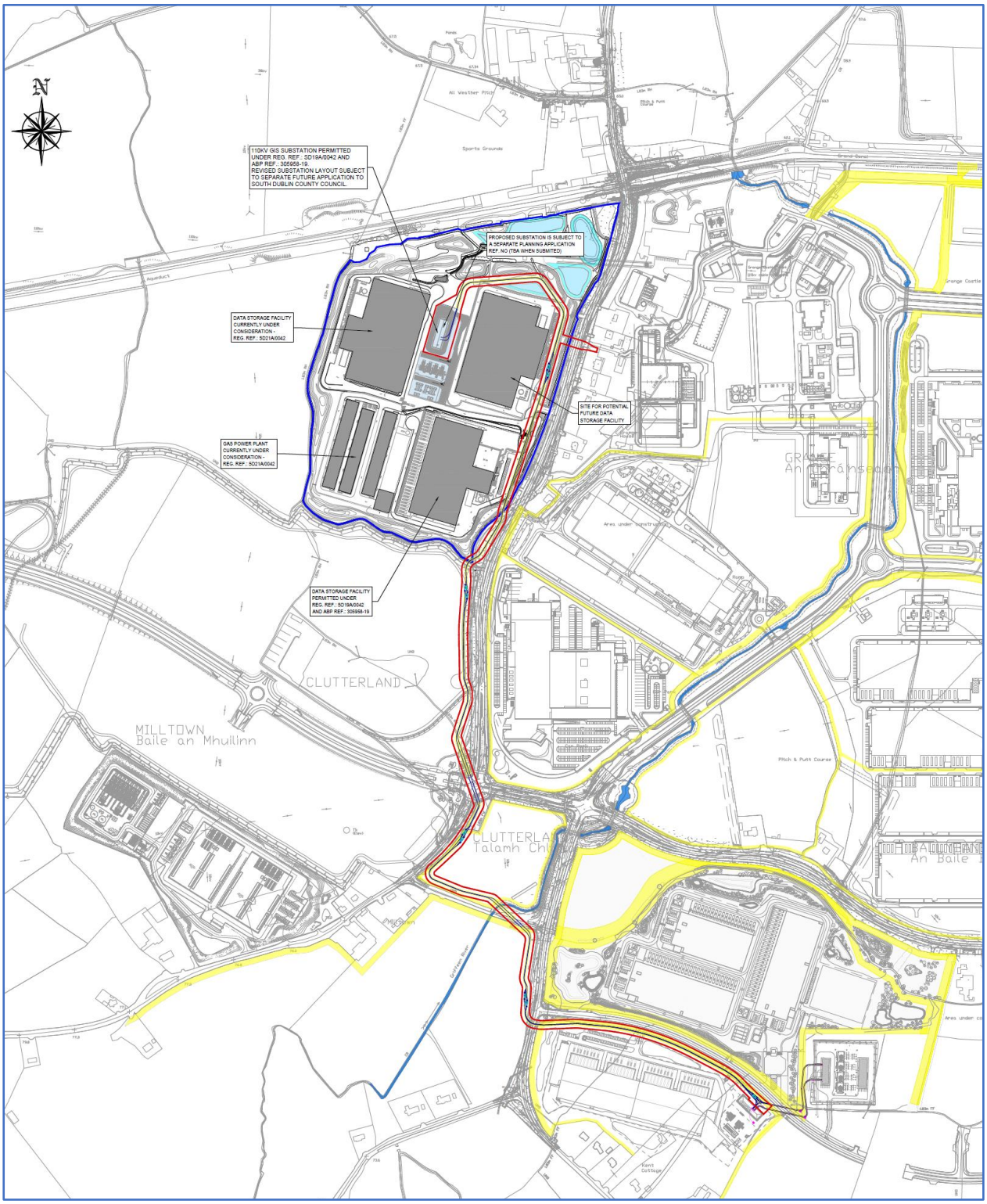

Figure 3. Plan of the Proposed Development with the powerline route outlined in red.

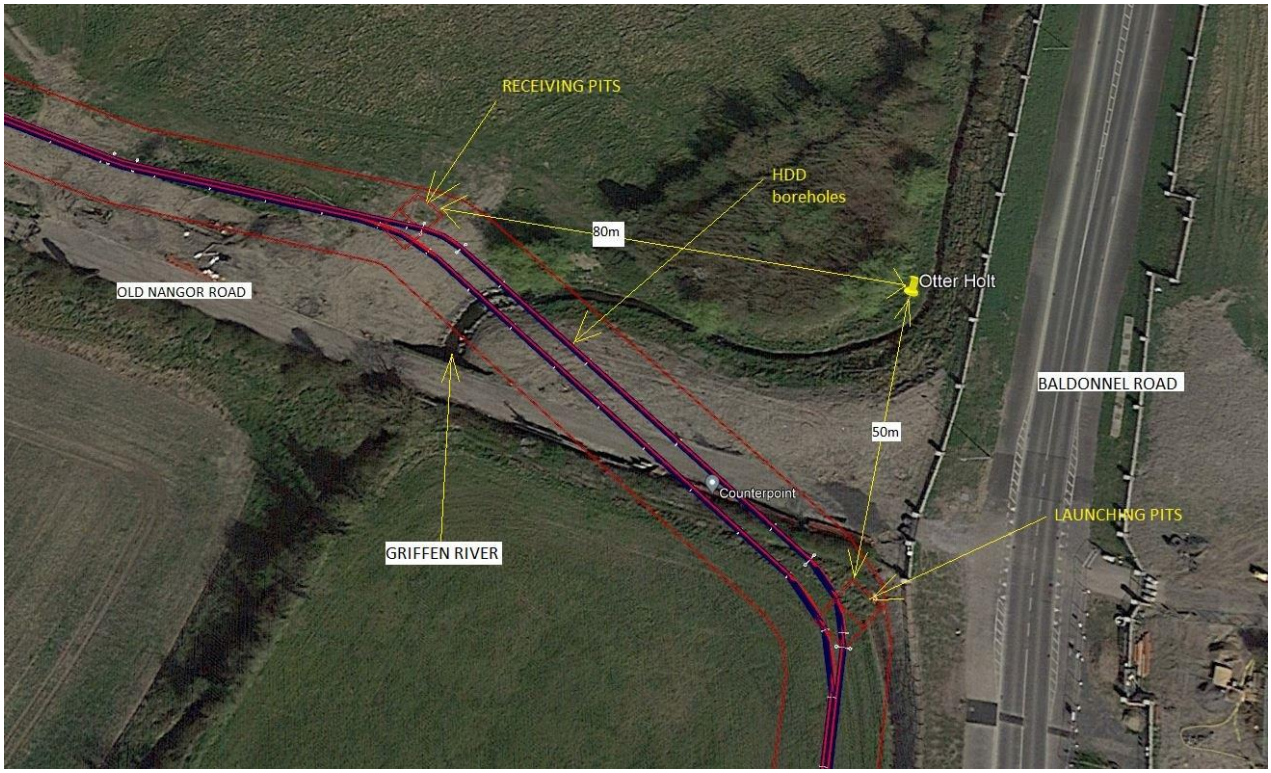

Figure 3a. Plan of the Proposed Development showing the HDD route under the Griffeen River.

4. Identification of Natura 2000 Sites

4.1. Description of Natura Sites Potentially Significantly Affected

A Zone of Influence (ZoI) of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. In accordance with the OPR Practice Note, PN01, the ZoI should be established on a case-by-case basis using the Source- Pathway-Receptor framework.

The European Commission's "*Assessment of plans and projects in relation to Natura 2000 sites guidance on Article 6(3) and (4) of the Methodological Habitats Directive 92/43/EEC*" published 28 September 2021 states at section 3.1.3:

Identifying the Natura 2000 sites that may be affected should be done by taking into consideration all aspects of the plan or project that could have potential effects on any Natura 2000 sites located within the zone of influence of the plan or project. This should take into account all of the designating features (species, habitat types) that are significantly present on the sites and their conservation objectives. In particular, it should identify:

- *any Natura 2000 sites geographically overlapping with any of the actions or aspects of the plan or project in any of its phases, or adjacent to them;*

- *any Natura 2000 sites within the likely zone of influence of the plan or project Natura 2000 sites located in the surroundings of the plan or project (or at some distance) that could still be indirectly affected by aspects of the project, including as regards the use of natural resources (e.g. water) and various types of waste, discharge or emissions of substances or energy;*

- *Natura 2000 sites in the surroundings of the plan or project (or at some distance) which host fauna that can move to the project area and then suffer mortality or other impacts (e.g. loss of feeding areas, reduction of home range);*

- *Natura 2000 sites whose connectivity or ecological continuity can be affected by the plan or project.*

The range of Natura 2000 sites to be assessed, i.e. the zone in which impacts from the plan or project may arise, will depend on the nature of the plan or project and the distance at which effects may occur. For Natura 2000 sites located downstream along rivers or wetlands fed by aquifers, it may be that a plan or project can affect water flows, fish migration and so forth, even at a great distance. Emissions of pollutants may also have effects over a long distance. Some projects or plans that do not directly affect Natura 2000 sites may still have a significant impact on them if they cause a barrier effect or prevent ecological linkages. This may happen, for example, when plans affect features of the landscape that connect Natura 2000 sites or that may obstruct the movements of species or disrupt the continuity of a fluvial or woodland ecosystem. To determine the possible effects of the plan or project on Natura 2000 sites, it is necessary to identify not only the relevant sites but also the habitats and species that are significantly present within them, as well as the site objectives.

The Zone of Influence may be determined by considering the Proposed Development's potential connectivity with European sites, in terms of:

- Nature, scale, timing and duration of all aspects of the proposed works and possible impacts, including the nature and size of excavations, storage of materials, flat/sloping sites;
- Distance and nature of potential pathways (dilution and dispersion; intervening 'buffer' lands, roads etc.); and
- Location of ecological features and their sensitivity to the possible impacts.

The potential for source pathway receptor connectivity is firstly identified through GIS interrogation and detailed information is then provided on sites with connectivity. European sites that are located within a potential Zone of Influence of the Proposed Development are presented in Figure 4 , below. Spatial boundary data on the Natura 2000 network was extracted from the NPWS website (www.npws.ie) on 31 July 2022. This data was interrogated using GIS analysis to provide mapping, distances, locations and pathways to all sites of conservation concern including pNHAs, NHA and European sites.

The nearest European site to the Proposed Development is the Rye Water Valley/Carton SAC (Site Code 001398), approximately 4.3km to the northwest. There is no hydrological connectivity to this site.

The Proposed Development is located within the hydrological catchment of the River Liffey, and involves drilling below the Griffeen River, a tributary of the River Liffey. Downstream, the waters of the River Liffey enters Dublin Bay with its European sites. There is no connectivity to these or any European sites.

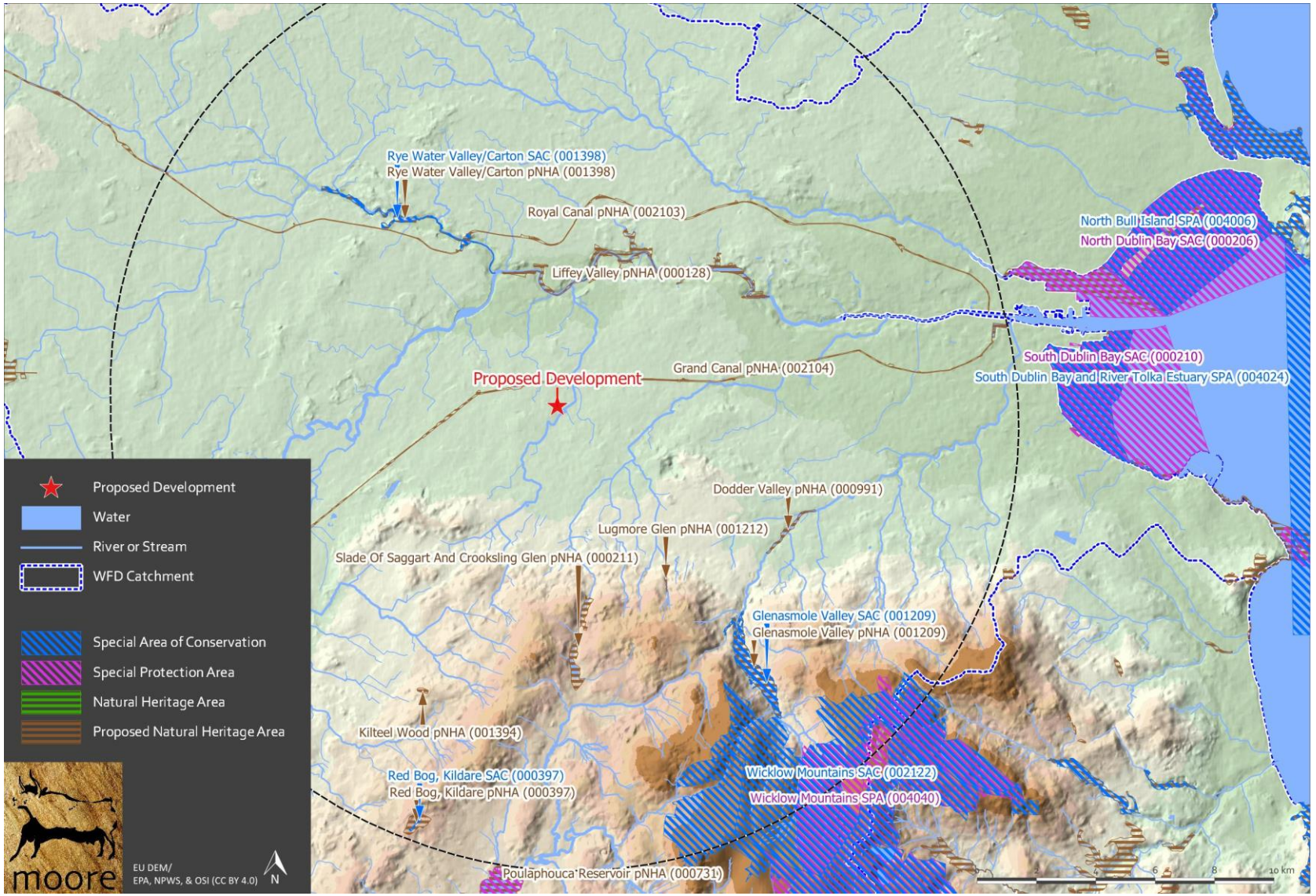

Figure 4. Showing European sites and NHAs/pNHAs within the wider Potential Zone of Influence of the Proposed Development.

4.2. Ecological Network Supporting Natura 2000 Sites

A concurrent GIS analysis of the proposed Natural Heritage Areas (pNHA) and designated Natural Heritage Areas (NHA) in terms of their role in supporting the species using Natura 2000 sites was undertaken along with GIS investigation of European sites. It was assumed that these supporting roles mainly related to mobile fauna such as mammals and birds which may use pNHAs and NHAs as ecological corridors or "stepping stones" between Natura 2000 sites.

Article 10 of the Habitats Directive and the Habitats Regulations 2011 place a high degree of importance on such non-Natura 2000 areas as features that connect the Natura 2000 network. Features such as ponds, woodlands and important hedgerows were taken into account in the decision process and during the preparation of this AA Screening report.

The NHAs and pNHAs identified in Figure 4 are located outside the Zone of Influence. There are no areas of supporting habitat that will be impacted by the proposed development.

5. Identification of Potential Impacts & Assessment of Significance

The Proposed Development is not directly connected with or necessary to the management of the sites considered in the assessment and therefore potential impacts must be identified and considered.

5.1. Assessment of Likely Significant Effects

There is no connectivity to any European sites within or outside the potential Zone of Influence.

The consideration of all potential direct and indirect impacts that may result in significant effects on the conservation objectives of a European site, taking into account the size and scale of the Proposed Development are presented in Table 3.

Table 1 Assessment of Likely Significant Effects.

Identification of all potential direct and indirect impacts that may result in significant effects on the conservation objectives of a European site, taking into account the size and scale of the project.	
Impacts:	**Significance of Impacts:**
Construction phase e.g.	None

Vegetation clearance Demolition Surface water runoff from soil excavation/infill/landscaping (including borrow pits) Dust, noise, vibration Lighting disturbance Impact on groundwater/dewatering Storage of excavated/construction materials Access to site Pests	The Proposed Development site is located within areas of bare ground and rough grassland. The Griffeen River will be under-passed by means of Horizontal Directional Drilling (HDD) at the Old Nangor Road Bridge. This method avoids interaction with the water course and its associated ecology and aquatic environment and removes connectivity with European sites located in Dublin Bay.
Operational phase e.g. Direct emission to air and water Surface water runoff containing contaminant or sediment Lighting disturbance Noise/vibration Changes to water/groundwater due to drainage or abstraction Presence of people, vehicles and activities Physical presence of structures (e.g. collision risks) Potential for accidents or incidents	There is no real likelihood of any significant effects on European Sites in the wider catchment area. The proposed development is located at a distance of removal such that there will be no disturbance to qualifying interest species in any European sites.
Describe any likely changes to the European site:	
Examples of the type of changes to give consideration to include: Reduction or fragmentation of habitat area Disturbance to QI species Habitat or species fragmentation Reduction or fragmentation in species density	None. The Proposed Development site is not located adjacent or within a European site, therefore there is no risk of habitat loss or fragmentation or any effects on QI habitats or species directly or ex-situ.

Changes in key indicators of conservation status value (water quality etc.) Changes to areas of sensitivity or threats to QI Interference with the key relationships that define the structure or ecological function of the site Climate change	
Are 'mitigation' measures necessary to reach a conclusion that likely significant effects can be ruled out at screening?	
No	N/A

On the basis of the information supplied, which is considered adequate to undertake a screening determination and having regard to:

- the nature and scale of the proposed development,
- the intervening land uses and distance from European sites,
- the lack of direct connections with regard to the Source-Pathway-Receptor model,

It may be concluded that the proposed development, individually or in-combination with other plans or projects, would not be likely to have a significant effect on the above listed European sites or any other European site, in view of the said sites' conservation objectives.

5.2. Assessment of Potential In-Combination Effects

In-combination effects are changes in the environment that result from numerous human-induced, small-scale alterations. In-combination effects can be thought of as occurring through two main pathways: first, through persistent additions or losses of the same materials or resource, and second, through the compounding effects as a result of the coming together of two or more effects.

As part of the Screening for an Appropriate Assessment, in addition to the Proposed Development, other relevant plans and projects in the area must also be considered at this stage. This step aims to identify at this early stage any possible significant in-combination effects of the Proposed Development with other such plans and projects on European sites.

A review of the National Planning Application Database was undertaken. The first stage of this review confirmed that there were no data gaps in the area where the Proposed Development is located. The database was then queried for developments granted planning permission within 500m of the Proposed Development within the last three years, these are presented in Table 4 below.

Table 2.Planning applications granted permission in the vicinity of the Proposed Development.

Planning Ref.	Description of development	Comments
SD21A/0241 ABP Ref.: ABP-313787-22	Demolition of the abandoned single storey dwelling and associated outbuilding (206sqm); construction of 2 two storey data centers with plant at roof level of each facility and associated ancillary development which will have a gross floor area of 40,589sq.m consisting of 1 two storey data center (Building 11) which will be located to the south of the site and will have a gross floor area of 24,667sq.m. including 22 emergency generators located at ground floor level within a compound to the western side of the data center with associated flues that will be 22.3m in height; 1 two storey data center (Building 12) which will be located to the north of the site, and to the immediate north of Building 11 and will have a gross floor area of 12,915sq.m including 11 emergency generators located at ground floor level within a compound to the western side of the data center with associated flues that will be 22.3m in height; each of the two data centers will include 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 which will provide emergency power to the admin and ancillary spaces; each generator will include a diesel tank and there will be a refuelling area to serve the proposed emergency generators; the overall height of each data center apart from the flues and plant at roof level is c. 14.23m above the finished floor level; the overall height of each data center apart from the flues and plant at roof level is c. 14.23m above the finished floor level; single storey step-up substation (38sq.m) as well as 2 single storey switch substations (121sq.m); AGI Gas Regulator compound that include 3 single storey buildings (134sq.m); construction of a gas powered generation plant in the form of a 13m high single storey building with a gross floor area of 2,714sq.m that will contain 10 gas generators with associated flues that will be 25m in height, and grouped in pairs and threes; the Gas Plant will be located to the west of Building 11; ancillary site development works, that will include reorientation of the Baldonnel Stream, biodiversity management initiatives, 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 internal road network within Profile Park; other ancillary site development works will include hard and soft landscaping, lighting, fencing, signage, services road, entrance gates, sprinkler tanks and pump room; a temporary gas powered generation plant within a fenced yard containing 21 generator units in containers, each with associated flues (each 25m high), 12 transformers and 10 containers of controls to be located to the west of, and associated with the first phase of Building 11, and will be required for a period of up to 2 years if connection to the national grid is delayed; this temporary plant will not be built if the connection to the national grid is in place prior to the operation of Building 11 at this site that includes an abandoned single storey residential property on the New Nangor Road (R134), Dublin 22; and on land within the townlands of Ballybane and Kilbride within Profile Park, Clondalkin, Dublin 22 on an overall site of 8.7 hectares.	No potential for in-combination effects given the scale and location of the project.
SD21A/0186	Construction of a 3 storey (part 4 storey) data centre known as 'DB8' to include data halls, electrical/plant rooms including internal generators, offices, lobbies, ancillary staff areas including break rooms and toilets, stores, stair/lift cores throughout and photovoltaic panels at roof level; the total gross floor area excluding hot air plenums and external staircase is c.9,601sq.m and the overall height of the data centre ranges from c.16m to c.20m to roof parapet level and up to c.24.48m including roof top plant, flues and lift overrun; provision of 5 external generators, 8 fuel tanks and ancillary plant contained within a plant yard to the north of DB8; provision of a water tank plant room, air cooled chillers and ancillary plant contained within a chiller plant yard to the south of DB8; provision of a water sprinkler pump room (c.23sqm), 2 sprinkler tanks (c.12m high each), heat recovery plant room (c.17sqm), ESB substation (c.44sqm), waste/bin stores (c.52sqm); total floor area of ancillary structures and plant (c.303sqm); provision of a delivery yard and loading bays, 64 car parking spaces, 5 motorcycle spaces, bicycle shelter serving 14 spaces, smoke shelter, internal access roads and footpaths, vehicular and pedestrian access to the west from Falcon Avenue and closure of an existing vehicular entrance from Falcon Avenue; all associated site development works, services provision, drainage works including attenuation, landscape and boundary treatment works including berming, hedgerow protection areas and security fencing; no buildings	No potential for in-combination effects given the scale and location of the project.

Planning Ref.	Description of development	Comments
	are proposed above the existing ESB wayleave and SDCC watermain wayleave to the west and north of the site; the area to the southwest of the site (temporary meadow) is reserved for a future data centre, subject of a separate application to South Dublin County Council on a site bounded to the east and south by Grange Castle Golf Club, to the north by Nangor Road (R134) and to the west by an estate road known as Falcon Avenue. This application is accompanied by a Natura Impact Statement.	
ABP-309146-21	The proposed development primarily comprises the provision of two 110kV transmission lines and a 110kV Gas Insulated Switchgear (GIS) substation compound along with associated and ancillary works and is described as follows: The proposed 110kV GIS Substation Compound is to be located on lands to the north-east of the two storey data centre facility and associated three storey office block that was permitted under SDCC Reg. Ref. SD18A/0134/An Bord Pleanála Ref. ABP-302813-18, and within an overall landholding bound to the north by the Grange Castle South Business Park access road; to the west by the Baldonnel Road and to the south by 3 residential properties and the Baldonnel Road; and to the east by the Google data centre facility within the Grange Castle South Business Park, Baldonnel, Dublin 22. The site of the proposed development has an area of c. 0.9163 hectares. 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 1,307.2sqm) (known as the Aungierstown Substation), two transformers, lighting and lightning masts, car parking, associated underground services and roads within a 2.6m high fenced compound and all associated construction and ancillary works. Two proposed underground single circuit 110kV transmission lines will connect the proposed Aungierstown 110kV GIS Substation to the existing 220kV / 110kV Castlebaggot Substation to the immediate north-east. The proposed transmission lines cover a distance of approximately 120m and 140m within the townlands of Ballybane, and Aungierstown and Ballybane. The development includes the connections to the two substations (existing and proposed), changes to landscaping permitted under SDCC Reg. Ref. SD18A/0134 / An Bord Pleanála Ref. ABP-302813-18 and all associated construction and ancillary works. An Environmental Impact Assessment Report has been prepared in respect of this application. The planning application and the Environmental Impact Assessment Report may be inspected free of charge or purchased on payment of a specified fee (which fee shall not exceed the reasonable cost of making such copy) during public opening hours for a period of seven weeks commencing on the 21st January 2021 at the following locations: The Offices of An Bord Pleanála, 64 Marlborough Street, Dublin 1. South Dublin County Council, County Hall, Town Centre, Tallaght, Dublin 24. The application may also be viewed/downloaded on the following website: www.aungierstown-substation.com Submissions or observations may be made only to An Bord Pleanála ('the Board'), 64 Marlborough Street, Dublin 1 during the above-mentioned period of seven weeks relating to: the implications of the proposed development for proper planning and sustainable development, and the likely effects on the environment of the proposed development, and the likely significant effects of the proposed development on a European site, if carried out. Any submissions/observations must be accompanied by a fee of €50 (except for certain prescribed bodies) and must be received by the Board not later than 5.30p.m. on the 10th March 2021. Such submissions/observations must also include the following information: The name of the person making the submission or observation, the name of the person acting on his or her behalf, if any, and the address to which any correspondence relating to the application should be sent, The subject matter of the submission or observation, and The reasons, considerations and arguments on which the submission or observation is based in full. (Article 217 of the Planning & Development Regulations refers). Any submissions or observations which do not comply with the above requirements cannot be considered by the Board. The Board may at its absolute discretion hold an oral hearing on the application. (For further details see 'A Guide to Public Participation in Strategic Infrastructure Development' on the Board's website www.pleanala.ie). The Board may in respect of an application for permission/ approval decide to (a) (i) grant the permission/approval, or (ii) make such modifications to the proposed development as it specifies in its decision and grant permission/approval in respect of the proposed development as so modified, or (iii) grant permission/approval in respect of part of the proposed development (with or without specified modifications of it of the foregoing kind), and any of the above	No potential for in-combination effects given the scale and location of the project.

Planning Ref.	Description of development	Comments
	decisions may be subject to or without conditions, or (b) refuse to grant the permission/approval. Any enquiries relating to the application process should be directed to the Strategic Infrastructure Development Section of a Bord Pleanála (Tel. 01- 8588100). A person may question the validity of any such decision by the Board by way of an application for judicial review, under Order 84 of the Rules of the Superior Courts (S. I. No.15 of 1986, as amended), in accordance with section 50 of the Planning and Development Act, 2000, as amended. Practical information on the review mechanism can be accessed under the heading Information on cases / Weekly lists - Judicial review of planning decisions on the Board's website www.pleanala.ie or on the Citizens Information Service website www.citizensinformation.ie.	
ABP-309146-21	The proposed development primarily comprises the provision of two 110kV transmission lines and a 110kV Gas Insulated Switchgear (GIS) substation compound along with associated and ancillary works and is described as follows: The proposed 110kV GIS Substation Compound is to be located on lands to the north-east of the two storey data centre facility and associated three storey office block that was permitted under SDCC Reg. Ref. SD18A/0134/An Bord Pleanála Ref. ABP-302813-18, and within an overall landholding bound to the north by the Grange Castle South Business Park access road; to the west by the Baldonnel Road and to the south by 3 residential properties and the Baldonnel Road; and to the east by the Google data centre facility within the Grange Castle South Business Park, Baldonnel, Dublin 22. The site of the proposed development has an area of c. 0.9163 hectares. 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 1,307.2sqm) (known as the Aungierstown Substation), two transformers, lighting and lightning masts, car parking, associated underground services and roads within a 2.6m high fenced compound and all associated construction and ancillary works. Two proposed underground single circuit 110kV transmission lines will connect the proposed Aungierstown 110kV GIS Substation to the existing 220kV / 110kV Castlebaggot Substation to the immediate north-east. The proposed transmission lines cover a distance of approximately 120m and 140m within the townlands of Ballybane, and Aungierstown and Ballybane. The development includes the connections to the two substations (existing and proposed), changes to landscaping permitted under SDCC Reg. Ref. SD18A/0134 / An Bord Pleanála Ref. ABP-302813-18 and all associated construction and ancillary works. An Environmental Impact Assessment Report has been prepared in respect of this application. The planning application and the Environmental Impact Assessment Report may be inspected free of charge or purchased on payment of a specified fee (which fee shall not exceed the reasonable cost of making such copy) during public opening hours for a period of seven weeks commencing on the 21st January 2021 at the following locations: The Offices of An Bord Pleanála, 64 Marlborough Street, Dublin 1. South Dublin County Council, County Hall, Town Centre, Tallaght, Dublin 24. The application may also be viewed/downloaded on the following website: www.aungierstown-substation.com Submissions or observations may be made only to An Bord Pleanála ('the Board'), 64 Marlborough Street, Dublin 1 during the above-mentioned period of seven weeks relating to: the implications of the proposed development for proper planning and sustainable development, and the likely effects on the environment of the proposed development, and the likely significant effects of the proposed development on a European site, if carried out. Any submissions/observations must be accompanied by a fee of €50 (except for certain prescribed bodies) and must be received by the Board not later than 5.30p.m. on the 10th March 2021. Such submissions/observations must also include the following information: The name of the person making the submission or observation, the name of the person acting on his or her behalf, if any, and the address to which any correspondence relating to the application should be sent, The subject matter of the submission or observation, and The reasons, considerations and arguments on which the submission or observation is based in full. (Article 217 of the Planning & Development Regulations refers). Any submissions or observations which do not comply with the above requirements cannot be considered by the Board. The Board may at its absolute discretion hold an oral hearing on the application. (For further details see 'A Guide to Public Participation in Strategic Infrastructure Development' on the Board's website www.pleanala.ie). The Board may in respect of an application for	No potential for in-combination effects given the scale and location of the project.

Planning Ref.	Description of development	Comments
	permission/ approval decide to (a) (i) grant the permission/approval, or (ii) make such modifications to the proposed development as it specifies in its decision and grant permission/approval in respect of the proposed development as so modified, or (iii) grant permission/approval in respect of part of the proposed development (with or without specified modifications of it of the foregoing kind), and any of the above decisions may be subject to or without conditions, or (b) refuse to grant the permission/approval. Any enquiries relating to the application process should be directed to the Strategic Infrastructure Development Section of a Bord Pleanála (Tel. 01- 8588100). A person may question the validity of any such decision by the Board by way of an application for judicial review, under Order 84 of the Rules of the Superior Courts (S. I. No.15 of 1986, as amended), in accordance with section 50 of the Planning and Development Act, 2000, as amended. Practical information on the review mechanism can be accessed under the heading Information on cases / Weekly lists - Judicial review of planning decisions on the Board's website www.pleanala.ie or on the Citizens Information Service website www.citizensinformation.ie.	
SD19A/0042	Phased development that will include 4 single storey data halls all with associated plant at roof level; 32 standby generators with associated flues (each 15m high); associated office and service areas; service road infrastructure and car parking; ESB sub-station/transformer yard with an overall gross floor area of 17,685sq.m; temporary gas powered generation plant within a walled yard containing 19 generator units with associated flues; Phase 1, 2 single storey data halls (6,950sq.m.) with roof plant and 16 stand-by generators with associated flues (each 15m high) as well as associated water tower and pump room and other services; single storey goods receiving area/store and single storey office area (1,522sq.m.) located attached and to the north-east of the data halls; temporary gas powered generation plant with 15 generators with associated flues (each 17m high) to be located within a compound to the west of the proposed data halls; attenuation pond; two storey ESB sub-station (494sq.m) with associated transformer yard and single storey transformer building (247sq.m) within compound; Phase 2, 2 single storey data halls (6,950sq.m.) with roof plant and 16 stand-by generators with associated flues (each 15m high); single storey goods receiving area/store and single storey office area; 4 additional generators with associated flues to be constructed within the temporary gas powered generation plant; also ancillary site works;	No potential for in-combination effects given the scale and location of the project.
SD19A/0153	3 new buildings. Block A: two storey with six industrial and office units; Block B: two storey with one industrial and office unit; Block C: three storey with ground floor café and office, first floor offices, second floor gym and ancillary areas; new perimeter wall and fence with two revised entrances and gates; surface car parking and all associated site works.	No potential for in-combination effects given the scale and location of the project.
SD19A/0300	Single storey ESB substation (27sq.m) that will be accessed from the north off the Grange Castle South Access Road via the Baldonnel Road and off the permitted internal road granted under Reg. Ref. SD18A/0134, An Bord Pleanála Ref. ABP-302813-18 to the south; the proposal will result in a minor and temporary amendment to the landscaping and fencing permitted under Reg. Ref. SD18A/0134, An Bord Pleanála Ref. ABP-302813-18 that granted permission for a two storey data centre and delivery bays with associated three storey office block and services within the overall lands; no other changes to the permission granted under this decision are proposed under this application.	No potential for in-combination effects given the scale and location of the project.
SD19A/0322	Construction of 1 & 2 storey office building, c.9.43m in height providing a total GFA of 459sq.m.; provision of 11 total car parking spaces; 8 covered cycle parking spaces; the removal of the existing temporary structures, landscaping, tree planting and all associated site and infrastructural works.	No potential for in-combination effects given the scale and location of the project.
SD19A/0342	Retention and continuance of the use for a further two years of the temporary gas powered generation plant which is located to the rear of the Takeda Ireland complex, is sited within a walled yard of 2,836sq.m containing 12 generator units with associated flues (each 15m high) which was permitted for a period of three years on the 10th January 2017 under Condition no.3 of permission granted under Reg. Ref. SD16A/0345;	No potential for in-combination effects given the scale and location of the project.

Planning Ref.	Description of development	Comments
	vehicular access to the generation plant will remain from the permitted service road into the EdgeConneX site and Grange Castle Business Park as originally permitted.	
SD20A/0031	Relocation of the temporary gas powered generation plant for a further two years from lands to the rear of the Takeda Ireland complex to the east of the site; to lands to the immediate north-west within the Edgeconnex campus and to the immediate east of the data centre granted and built under Reg. Ref. SD17A/0141 and SD17A/0392; the relocated temporary gas powered generation plant will be enclosed within a walled yard of 2,836sq.m containing 12 generator units with associated flues (each 15m high) that was permitted for a period of three years on the 15th May 2017 under condition No. 4 of permission granted under Reg. Ref. SD17A/0027; vehicular access to the generation plant will remain from the permitted service road into the Edgeconnex site and Grange Castle Business Park as originally permitted.	No potential for in-combination effects given the scale and location of the project.
SD20A/0058	Demolition of the existing buildings; demolition of the single storey stable building on the overall site; construction of a gas powered Power Plant with all its associated elements; the part single and part two storey property of Bulmer and an agricultural building to the east of the overall site will not be demolished; The Power Plant compound of 14,475sq.m will contain 2 Power Units each with 1 25m height stack (2 overall), transformers, air intakes and electrical modules; the Power Plant compound will also contain a two storey administration and workshop building (427sq.m) and LV switchgear building (140sq.m) (567sq.m in total) plus an AGI connection, gas compressor, water tank, water treatment, firewater tank and pumps, fuel skids, fuel tank and 1 emergency diesel generator; the proposal also includes a battery energy storage system compound of 3,300sq.m containing 15 battery containers and 15 inverters that will be linked to the Power Plant	No potential for in-combination effects given the scale and location of the project.
SD20A/0121	The development will consist of the following: (1) The demolition of the existing two storey dwelling of Ballybane and associated farm buildings and the construction of 3 two storey data centres with mezzanine floors and associated ancillary development that will have a gross floor area of 80,269sq.m on an overall site of 16.5hectares. (2) 1 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 28,573sq.m. and will include 26 emergency generators located at ground floor level. The facility will also include 26 ventilation shafts which will be located above the northern end of each emergency generator that will measure 20m in height. (3) 1 two storey data centre (Building B) which 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 21,725sq.m and which will include 18 emergency generators located at ground floor level associated flues that will be 25m in height. The facility will also include 18 ventilation shafts which will be located above the southern end of each emergency generator that will measure 20m in height. (4) 1 two storey data centre (Building C), will be located to the eastern part of the site on a north-south axis and will have a gross floor area of 28,573sq.m. It will include 26 emergency generators located at ground floor level. The facility will also include 26 ventilation shafts that will be located above the western end of each emergency generator that will measure 20m in height. (5) Each of the three data centres will include data storage rooms, associated electrical and mechanical plant rooms, loading bays, maintenance and storage spaces, office administration areas, and plant. Each data centre will also include a diesel tank and a refuelling area to serve the proposed emergency generators. (6) 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. (7) 1 temporary and single storey substation (29sq.m). (8) 3 single storey MV buildings (9) 8 prefabricated containerised electrical rooms. (10) Ancillary site development works. Other ancillary site development works will include hard and soft landscaping, lighting, fencing, signage, service road, entrance gate, sprinkler tank house (72sq.m), security hut (30sq.m) and 150 car parking spaces and 78 sheltered bicycle parking spaces.	No potential for in-combination effects given the scale and location of the project.
SD20A/0124	(1) Demolition of existing single storey dwelling (c.108.5sq.m); (2) construction of a Distribution Warehouse Building comprising warehousing and ancillary areas at ground floor and support offices, staff areas and plant across two floors; (3) the development will be accessed from the existing Profile Park estate road; (4) provision of car parking, cycle parking, security gatehouse, landscaping and boundary treatments (including security fencing and gates); (5) all associated site development and services works	No potential for in-combination effects given the scale and location of the project.

Planning Ref.	Description of development	Comments
	(including diversion/culverting/reprofiling of existing stream on site); (6) total gross floor area of the development c.17,006sq.m.	
SD20A/0147	Construction of P3 Phase II expansion of the existing P3 biopharma production facility which includes the construction of a circa 2,155sq.m, two storey biopharma production facility to be located to the south of the existing P3 building; single storey administration extension to the north of the existing P3 building and internal modifications to the existing P3 building; courier pick up/drop off area with 5 parking spaces; extension to existing external utilities yard for 3 heat pumps and other ancillary equipment; new internal site circulation road and re-alignment of existing circulation road;, hard and soft landscaping and external lighting;	No potential for in-combination effects given the scale and location of the project.
SD20A/0244	Retention of single storey client control room (248.5sq.m) associated with the planned future substation that will be located to the north-east of the permitted data centre development granted under Reg. Ref. SD18A/0134/ABP Ref. ABP-302813-18	No potential for in-combination effects given the scale and location of the project.
SD20A/0283	Demolition of existing single storey vacant house, garage and outhouse; Construction of a single 1-4 storey Central Administration Building and 2 2-storey (with mezzanine) data centres (DUB14 & DUB15) all to be located west of data centres DUB9, DUB10, DUB12 & DUB13 within the MS campus; The Central Administration Building will comprise central office administration, with staff cafeteria, staff gym and, with provision of PV panels on the roof; each data will include data halls, admin blocks and a variety of mechanical and electrical plant areas/structures.; DUB14 will also include 21 diesel generators and associated sub-stations (E-houses) and 11 mechanical flues; Provision of a gas generator compound (to serve DUB15) containing 20 generators, 5 E-houses and 5 flues; Provision of a Gas Networks Ireland gas skid including 3 kiosk buildings; Expansion of existing electrical sub-station compound ; Provision of 168 permanent car parking spaces and 40 cycle parking spaces; Provision of additional western access to the MS; Provision of a new temporary construction car park; Total gross floor area of the development will be c.59,766sq.m; All associated site development works, drainage and services provision, landscaping, boundary treatments (including security fencing) and associated works;	No potential for in-combination effects given the scale and location of the project.
SD20A/0295	Amendments and modifications to the permitted data centre development granted under Reg. Ref. SD18A/0134 - ABP Ref. ABP-302813-18 and the temporary substation permission granted under SD19A/0300 to include: Demolition of storey Weston House, outbuildings, stables of Weston Lodge; and the single storey dwelling and converted garage of Kent Cottage. Retention of sprinkler tank and pump house to the south-west of Building A Data Centre to replace 4 sprinkler tanks; Retention of 40kW(p) PV panels on the roof of Building A Data Centre; Retention of revised size of northern attenuation pond and loss of permitted landscaping to its south; Retention of ramped access to rear of temporary substation permitted under SD19A/0300; Retention of revised position of security fence to north, west and south of Building A Data Centre; and retention and modifications of landscape berm along Baldonnel Road and to east of Weston House. Development will consist of new works to include: Modifications of permitted vehicular entrance; Modification to car parking; Modifications of flue arrangement for Building B Data Centre; Modifications to permitted landscape scheme to north and south of Building A Data Centre;	No potential for in-combination effects given the scale and location of the project.
SD20A/0324	Demolition of existing buildings; construction of 2 two storey Information Communication Technology (ICT) facilities each with three storey plant levels and associated ancillary development which will have a gross floor area of 30,518sq.m on an overall site of 8.2 hectares; ICT (building A) will be located to the south-east of the site and will have a gross floor area of 15,196sq.m including 18 emergency generators; ICT facility (building B) will be located to the north-west of Building A and centrally within the overall site and will have a gross floor area of 15,196sq.m including 18 emergency generators located at ground and first floor level; each of the two ICT facilities will include data storage rooms, associated electrical and mechanical plant rooms, loading bays, maintenance and storage spaces, office administration areas; 2 pump rooms of 25sq.m each (4 overall - 100sq.m) plus water storage tanks and plant as well as a separate house generator; 1 temporary and single storey substation (26sq.m); ancillary site development works including attenuation ponds and the installation and	No potential for in-combination effects given the scale and location of the project.

Planning Ref.	Description of development	Comments
	connection to the underground foul and storm water drainage network and installation of utility ducts and cables; other ancillary site development.	
SD21A/0042	Construction of two single storey data centres with associated office and service areas; and three gas powered generation plant buildings with an overall gross floor area of 24,624sq.m; that will be attached to a single storey goods receiving area/store and a single storey office area; Amendments to the internal access road and omission of access to loading bay permitted under SDCC planning Ref. SD19A/0042/ABP Ref. PL06S.305948 that include the relocation of permitted, and new, internal security gates; and new internal access roads to serve the proposed development; The phased development of 3 two storey gas powered generation plants within three individual buildings and ancillary development to provide power to facilitate the development of the overall site. Gas plant 1 (3,045sq.m) will contain 20 generator units (18+2) with associated flues. Gas plant 2 (3,045sq.m) will contain 20 generator units (18+2) with associated flues (each 25m high). and, Gas plant 3 (3,196sq.m) will contain 21 generator units (19+2) with associated flues (each 25m high); New attenuation pond to the north of the site; Proposed above ground gas installation compound to contain single storey kiosk (93sq.m) and boiler room (44sq.m).	No potential for in-combination effects given the scale and location of the project.
SD21A/0127	Retention of 1 standby diesel generator with an associated flue (15m high) within the permitted generator compound located to the east of the data centre granted under SDCC Reg. SD16A/0345 increasing the number of standby diesel generators from 5 to 6 within the permitted compound.	No potential for in-combination effects given the scale and location of the project.
SD21A/0203	Modifications and minor additions to previously approved scheme (Planning Register Reference SD20A/0283) comprising Approved Central Administration Building (CAB), relocation of building to the east by approx. 7m; reconfiguration and setting out of building plans at all levels (including roof level) resulting in increase in building footprint of approximately 170sq.; approved four-storey Office element, parapet at roof level to be raised by approx. 1; overall increase in GIFA of 395sq.m; reconfiguration of area available for PV panels and sedum roof finish in order to accommodate required MEP equipment at roof levels. approved Data Centres - DUB14 and DUB15, reconfiguration and setting out affecting building locations and plans at all levels (including roof level) resulting in reduction in overall building footprint (for each building) by 48sq.m; DUB 14; DUB 15, change to level of ground floor and associated increase in overall building height of approx; relocation, modifications to design and expansion of approved Water Treatment Building and associated plant to include, Water Treatment Tanks, 2 sprinkler tanks and relocated approved pump house and 1 generator with additional proposed flue stack and 1 transformer; Relocation & reconfiguration of previously approved gas generator compound including, additional 4 generators omission of approved E-houses; additional 7 electrical rooms, additional 7 flues; modifications to approved layout of internal site roads, yards and footpaths; relocation and modifications to design of approved Sprinkler Tanks and Pump Houses, Pump House serving DUB 14, relocated into proposed Water Treatment Building and compound, redesign of approved larger tank into proposed two smaller tanks;; relocation of Approved Gas Networks Ireland (GNI) gas skid & compound including approved 3 kiosk buildings; the remainder of the development (including permitted temporary construction car parking) to be carried out in accordance with parent permission SD20A/0283.	No potential for in-combination effects given the scale and location of the project.
SD22A/0007	The permanent continuation of use of the following existing buildings and structures: a prefabricated office; prefabricated canteen facilities water holding tank; 4 aggregate ground storage bays; power house; and weighbridge, all previously permitted for a five year period under Pl. Ref. SD17A/0218.	No potential for in-combination effects given the scale and location of the project.
SD22A/0022	The construction of a 2-storey extension and any associated site works to the south elevation of the existing engineering stores in the administration offices building.	No potential for in-combination effects given the scale and location of the project.
SD22A/0025	Retention and use for a further two years of the temporary gas powered generation plant, which was permitted initially for a period of three years under Reg Ref.	No potential for in-combination

Planning Ref.	Description of development	Comments
	SD16A/0345 and was subsequently extended for an additional period of 2 years from the 4th February 2020 under Condition no. 2 of permission granted under SD19A/0342	effects given the scale and location of the project.

The South Dublin County Development Plan in complying with the requirements of the Habitats Directive requires that all Projects and Plans that could affect the Natura 2000 sites in the same potential Zone of Influence of the Proposed Development site would be initially screened for Appropriate Assessment and if requiring Stage 2 AA, that appropriate employable mitigation measures would be put in place to avoid, reduce or ameliorate negative impacts. In this way any, in-combination impacts with Plans or Projects for the proposed development area and surrounding townlands in which the proposed development site is located, would be avoided.

The listed developments have been granted permission in most cases with conditions relating to sustainable development by the consenting authority in compliance with the relevant Local Authority Development Plan and in compliance with the Local Authority requirement with regard to the Habitats Directive. The development cannot have received planning permission without having met the consenting authority requirement in this regard.

There are no predicted in-combination effects given that it is predicted that the Proposed Development will have no effect on any European site.

Any new applications for the Proposed Development area will be assessed on a case by case basis *initially* by South Dublin County Council which will determine the requirement for AA Screening as per the requirements of Article 6(3) of the Habitats Directive.

6. Conclusion

There is no connectivity to any European sites within or outside the potential Zone of Influence.

There are no predicted effects on any European sites given:

- The distance between the Proposed Development and any European Sites, approximately 4km;
- The lack of connectivity between the Proposed Development and any hydrological pathways; there are no watercourses within the Proposed Development boundary and there is no connectivity between the Proposed Development site and any watercourses that lead to any European sites;
- The Proposed Development is to be connected to the existing public sewer network for the treatment of wastewater.

- There are no predicted emissions to air, water or the environment during the construction or operational phases that would result in significant effects.

It has been objectively concluded by Moore Group Environmental Services that:

1. The Proposed Development is not directly connected with, or necessary to the conservation management of the European sites considered in this assessment.
2. The Proposed Development is unlikely to either directly or indirectly significantly affect the Qualifying interests or Conservation Objectives of the European sites considered in this assessment.
3. The Proposed Development, alone or in combination with other projects, is not likely to have significant effects on the European sites considered in this assessment in view of their conservation objectives.
4. It is possible to conclude that significant effects can be excluded at the screening stage.

It can be *excluded*, on the basis of objective information, that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on a European site.

An appropriate assessment is not, therefore, required.

A finding of no significant effects report is presented in Appendix A in accordance with the EU Commission's methodological guidance (European Commission, 2002).

7. References

Department of the Environment, Heritage and Local Government (2010) Guidance on Appropriate Assessment of Plans and Projects in Ireland (as amended February 2010).

European Commission (2000) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

European Commission (2007) Guidance document on Article 6(4) of the 'Habitats Directive '92/43/EEC: Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interests, compensatory measures, overall coherence and opinion of the Commission. European Commission, Brussels.

European Commission (2018) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

European Commission (2021) Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC, Brussels 28.9.21.

European Commission (2021) Guidance document on the strict protection of animal species of Community interest under the Habitats Directive, Brussels 12.10.21.

NPWS (2019) The Status of EU Protected Habitats and Species in Ireland. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

NPWS (2022) National Parks and Wildlife Service Metadata available online at https://www.npws.ie/maps-and-data

Office-of-the-Planning-Regulator (2021) Appropriate Assessment Screening for Development Management OPR Practice Note PN01. March 2021

Appendix A

FINDING OF NO SIGNIFICANT EFFECTS REPORT

Finding no significant effects report matrix

Name of project or plan

Kishoge 110Kv Transmission Line

Name and location of the Natura 2000 site(s)

The nearest European site to the Proposed Development is the Rye Water Valley/Carton SAC (Site Code 001398), approximately 4.3km to the northwest. There is no hydrological connectivity to this site.

The Proposed Development is located within the hydrological catchment of the River Liffey, and involves drilling below the Griffeen River, a tributary of the River Liffey, at one point. Downstream, the waters of the River Liffey enters Dublin Bay with its European sites. There is no connectivity to these or any European sites.

Description of the project or plan

The Proposed Development consists of the construction and operation of a 110kV transmission line at Kishoge, Co. Dublin. The line extends between the Kishoge 110kV Gas Insulated switchgear (GIS) substation on a site within the townland of Ballymakaily, west of Newcastle Road (R120), Lucan, Co. Dublin, and the permitted Aungierstown – Castlebaggot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnel, Dublin 22. The proposed transmission lines provide for a loop-in connection to the permitted Aungierstgown – Castlebaggot transmission line.

The Griffeen River will be under-passed by means of Horizontal Directional Drilling (HDD) at the Old Nangor Road Bridge. This method avoids interaction with the water course and its associated ecology and aquatic environment and removes connectivity with European sites located in Dublin Bay.

Is the project or plan directly connected with or necessary to the management of the site(s)

No

Are there other projects or plans that together with the projects or plan being assessed could affect the site

A review of the National Planning Application Database was undertaken. The first stage of this review confirmed that there were no data outages in the area where the Proposed Development is located. The database was then queried for developments granted planning permission within 500m of the Proposed Development within the last three years, these are presented in the Table below.

Planning applications granted permission in the vicinity of the Proposed Development.

Planning Ref.	Description of development	Comments
SD19A/0042	Phased development that will include 4 single storey data halls all with associated plant at roof level; 32 standby generators with associated flues (each 15m high); associated office and service areas; service road infrastructure and car parking; ESB sub-station/transformer yard with an overall gross floor area of 17,685sq.m; temporary gas powered generation plant within a walled yard containing 19 generator units with associated flues; Phase 1, 2 single storey data halls (6,950sq.m.) with roof plant and 16 stand-by generators with associated flues (each 15m high) as well as associated water tower and pump room and other services; single storey goods receiving area/store and single storey office area (1,522sq.m.) located attached and to the north-east of the data halls; temporary gas powered generation plant with 15 generators with associated flues (each 17m high) to be located within	No potential for in-combination effects given the scale and location of the project.

Planning Ref.	Description of development	Comments
	a compound to the west of the proposed data halls; attenuation pond; two storey ESB sub-station (494sq.m) with associated transformer yard and single storey transformer building (247sq.m) within compound; Phase 2, 2 single storey data halls (6,950sq.m.) with roof plant and 16 stand-by generators with associated flues (each 15m high); single storey goods receiving area/store and single storey office area; 4 additional generators with associated flues to be constructed within the temporary gas powered generation plant; also ancillary site works;	
SD19A/0153	3 new buildings. Block A: two storey with six industrial and office units; Block B: two storey with one industrial and office unit; Block C: three storey with ground floor café and office, first floor offices, second floor gym and ancillary areas; new perimeter wall and fence with two revised entrances and gates; surface car parking and all associated site works.	No potential for in-combination effects given the scale and location of the project.
SD19A/0300	Single storey ESB substation (27sq.m) that will be accessed from the north off the Grange Castle South Access Road via the Baldonnel Road and off the permitted internal road granted under Reg. Ref. SD18A/0134, An Bord Pleanála Ref. ABP-302813-18 to the south; the proposal will result in a minor and temporary amendment to the landscaping and fencing permitted under Reg. Ref. SD18A/0134, An Bord Pleanála Ref. ABP-302813-18 that granted permission for a two storey data centre and delivery bays with associated three storey office block and services within the overall lands; no other changes to the permission granted under this decision are proposed under this application.	No potential for in-combination effects given the scale and location of the project.
SD19A/0322	Construction of 1 & 2 storey office building, c.9.43m in height providing a total GFA of 459sq.m.; provision of 11 total car parking spaces; 8 covered cycle parking spaces; the removal of the existing temporary structures, landscaping, tree planting and all associated site and infrastructural works.	No potential for in-combination effects given the scale and location of the project.
SD19A/0342	Retention and continuance of the use for a further two years of the temporary gas powered generation plant which is located to the rear of the Takeda Ireland complex, is sited within a walled yard of 2,836sq.m containing 12 generator units with associated flues (each 15m high) which was permitted for a period of three years on the 10th January 2017 under Condition no.3 of permission granted under Reg. Ref. SD16A/0345; vehicular access to the generation plant will remain from the permitted service road into the EdgeConneX site and Grange Castle Business Park as originally permitted.	No potential for in-combination effects given the scale and location of the project.
SD20A/0031	Relocation of the temporary gas powered generation plant for a further two years from lands to the rear of the Takeda Ireland complex to the east of the site; to lands to the immediate north-west within the Edgeconnex campus and to the immediate east of the data centre granted and built under Reg. Ref. SD17A/0141 and SD17A/0392; the relocated temporary gas powered generation plant will be enclosed within a walled yard of 2,836sq.m containing 12 generator units with associated flues (each 15m high) that was permitted for a period of three years on the 15th May 2017 under condition No. 4 of permission granted under Reg. Ref. SD17A/0027; vehicular access to the generation plant will remain from the permitted service road into the Edgeconnex site and Grange Castle Business Park as originally permitted.	No potential for in-combination effects given the scale and location of the project.
SD20A/0058	Demolition of the existing buildings; demolition of the single storey stable building on the overall site; construction of a gas powered Power Plant with all its associated elements; the part single and part two storey property of Bulmer and an agricultural building to the east of the overall site will not be demolished; The Power Plant compound of 14,475sq.m will contain 2 Power Units each with 1 25m height stack (2 overall), transformers, air intakes and electrical modules; the Power	No potential for in-combination effects given the scale and location of the project.

Planning Ref.	Description of development	Comments
	Plant compound will also contain a two storey administration and workshop building (427sq.m) and LV switchgear building (140sq.m) (567sq.m in total) plus an AGI connection, gas compressor, water tank, water treatment, firewater tank and pumps, fuel skids, fuel tank and 1 emergency diesel generator; the proposal also includes a battery energy storage system compound of 3,300sq.m containing 15 battery containers and 15 inverters that will be linked to the Power Plant	
SD20A/0121	The development will consist of the following: (1) The demolition of the existing two storey dwelling of Ballybane and associated farm buildings and the construction of 3 two storey data centres with mezzanine floors and associated ancillary development that will have a gross floor area of 80,269sq.m on an overall site of 16.5hectares. (2) 1 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 28,573sq.m. and will include 26 emergency generators located at ground floor level. The facility will also include 26 ventilation shafts which will be located above the northern end of each emergency generator that will measure 20m in height. (3) 1 two storey data centre (Building B) which 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 21,725sq.m and which will include 18 emergency generators located at ground floor level associated flues that will be 25m in height. The facility will also include 18 ventilation shafts which will be located above the southern end of each emergency generator that will measure 20m in height. (4) 1 two storey data centre (Building C), will be located to the eastern part of the site on a north-south axis and will have a gross floor area of 28,573sq.m. It will include 26 emergency generators located at ground floor level. The facility will also include 26 ventilation shafts that will be located above the western end of each emergency generator that will measure 20m in height. (5) Each of the three data centres will include data storage rooms, associated electrical and mechanical plant rooms, loading bays, maintenance and storage spaces, office administration areas, and plant. Each data centre will also include a diesel tank and a refuelling area to serve the proposed emergency generators. (6) 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. (7) 1 temporary and single storey substation (29sq.m). (8) 3 single storey MV buildings (9) 8 prefabricated containerised electrical rooms. (10) Ancillary site development works. Other ancillary site development works will include hard and soft landscaping, lighting, fencing, signage, service road, entrance gate, sprinkler tank house (72sq.m), security hut (30sq.m) and 150 car parking spaces and 78 sheltered bicycle parking spaces.	No potential for in-combination effects given the scale and location of the project.
SD20A/0124	(1) Demolition of existing single storey dwelling (c.108.5sq.m); (2) construction of a Distribution Warehouse Building comprising warehousing and ancillary areas at ground floor and support offices, staff areas and plant across two floors; (3) the development will be accessed from the existing Profile Park estate road; (4) provision of car parking, cycle parking, security gatehouse, landscaping and boundary treatments (including security fencing and gates); (5) all associated site development and services works (including diversion/culverting/reprofiling of existing stream on site); (6) total gross floor area of the development c.17,006sq.m.	No potential for in-combination effects given the scale and location of the project.
SD20A/0147	Construction of P3 Phase II expansion of the existing P3 biopharma production facility which includes the construction of a circa 2,155sq.m, two storey biopharma production facility to be located to the south of the existing P3 building; single storey administration extension to the north of the existing P3 building and internal modifications to the existing P3 building; courier pick up/drop off area	No potential for in-combination effects given the scale and location of the project.

Planning Ref.	Description of development	Comments
	with 5 parking spaces; extension to existing external utilities yard for 3 heat pumps and other ancillary equipment; new internal site circulation road and re-alignment of existing circulation road;, hard and soft landscaping and external lighting;	
SD20A/0244	Retention of single storey client control room (248.5sq.m) associated with the planned future substation that will be located to the north-east of the permitted data centre development granted under Reg. Ref. SD18A/0134/ABP Ref. ABP-302813-18	No potential for in-combination effects given the scale and location of the project.
SD20A/0283	Demolition of existing single storey vacant house, garage and outhouse; Construction of a single 1-4 storey Central Administration Building and 2 2-storey (with mezzanine) data centres (DUB14 & DUB15) all to be located west of data centres DUB9, DUB10, DUB12 & DUB13 within the MS campus; The Central Administration Building will comprise central office administration, with staff cafeteria, staff gym and, with provision of PV panels on the roof; each data will include data halls, admin blocks and a variety of mechanical and electrical plant areas/structures.; DUB14 will also include 21 diesel generators and associated sub-stations (E-houses) and 11 mechanical flues; Provision of a gas generator compound (to serve DUB15) containing 20 generators, 5 E-houses and 5 flues; Provision of a Gas Networks Ireland gas skid including 3 kiosk buildings; Expansion of existing electrical sub-station compound ; Provision of 168 permanent car parking spaces and 40 cycle parking spaces; Provision of additional western access to the MS; Provision of a new temporary construction car park; Total gross floor area of the development will be c.59,766sq.m; All associated site development works, drainage and services provision, landscaping, boundary treatments (including security fencing) and associated works;	No potential for in-combination effects given the scale and location of the project.
SD20A/0295	Amendments and modifications to the permitted data centre development granted under Reg. Ref. SD18A/0134 - ABP Ref. ABP-302813-18 and the temporary substation permission granted under SD19A/0300 to include: Demolition of storey Weston House, outbuildings, stables of Weston Lodge; and the single storey dwelling and converted garage of Kent Cottage. Retention of sprinkler tank and pump house to the south-west of Building A Data Centre to replace 4 sprinkler tanks; Retention of 40kW(p) PV panels on the roof of Building A Data Centre; Retention of revised size of northern attenuation pond and loss of permitted landscaping to its south; Retention of ramped access to rear of temporary substation permitted under SD19A/0300; Retention of revised position of security fence to north, west and south of Building A Data Centre; and retention and modifications of landscape berm along Baldonnel Road and to east of Weston House. Development will consist of new works to include: Modifications of permitted vehicular entrance; Modification to car parking; Modifications of flue arrangement for Building B Data Centre; Modifications to permitted landscape scheme to north and south of Building A Data Centre;	No potential for in-combination effects given the scale and location of the project.
SD20A/0324	Demolition of existing buildings; construction of 2 two storey Information Communication Technology (ICT) facilities each with three storey plant levels and associated ancillary development which will have a gross floor area of 30,518sq.m on an overall site of 8.2 hectares; ICT (building A) will be located to the south-east of the site and will have a gross floor area of 15,196sq.m including 18 emergency generators; ICT facility (building B) will be located to the north-west of Building A and centrally within the overall site and will have a gross floor area of 15,196sq.m including 18 emergency generators located at ground and first floor level; each of the two ICT facilities will include data storage rooms, associated electrical and mechanical plant rooms, loading bays, maintenance and storage spaces, office administration areas; 2 pump rooms of 25sq.m each (4 overall -	No potential for in-combination effects given the scale and location of the project.

Planning Ref.	Description of development	Comments
	100sq.m) plus water storage tanks and plant as well as a separate house generator; 1 temporary and single storey substation (26sq.m); ancillary site development works including attenuation ponds and the installation and connection to the underground foul and storm water drainage network and installation of utility ducts and cables; other ancillary site development.	
SD21A/0042	Construction of two single storey data centres with associated office and service areas; and three gas powered generation plant buildings with an overall gross floor area of 24,624sq.m; that will be attached to a single storey goods receiving area/store and a single storey office area; Amendments to the internal access road and omission of access to loading bay permitted under SDCC planning Ref. SD19A/0042/ABP Ref. PL06S.305948 that include the relocation of permitted, and new, internal security gates; and new internal access roads to serve the proposed development; The phased development of 3 two storey gas powered generation plants within three individual buildings and ancillary development to provide power to facilitate the development of the overall site. Gas plant 1 (3,045sq.m) will contain 20 generator units (18+2) with associated flues. Gas plant 2 (3,045sq.m) will contain 20 generator units (18+2) with associated flues (each 25m high). and, Gas plant 3 (3,196sq.m) will contain 21 generator units (19+2) with associated flues (each 25m high); New attenuation pond to the north of the site; Proposed above ground gas installation compound to contain single storey kiosk (93sq.m) and boiler room (44sq.m).	No potential for in-combination effects given the scale and location of the project.
SD21A/0127	Retention of 1 standby diesel generator with an associated flue (15m high) within the permitted generator compound located to the east of the data centre granted under SDCC Reg. SD16A/0345 increasing the number of standby diesel generators from 5 to 6 within the permitted compound.	No potential for in-combination effects given the scale and location of the project.
SD21A/0203	Modifications and minor additions to previously approved scheme (Planning Register Reference SD20A/0283) comprising Approved Central Administration Building (CAB), relocation of building to the east by approx. 7m; reconfiguration and setting out of building plans at all levels (including roof level) resulting in increase in building footprint of approximately 170sq.; approved four-storey Office element, parapet at roof level to be raised by approx. 1; overall increase in GIFA of 395sq.m; reconfiguration of area available for PV panels and sedum roof finish in order to accommodate required MEP equipment at roof levels. approved Data Centres - DUB14 and DUB15, reconfiguration and setting out affecting building locations and plans at all levels (including roof level) resulting in reduction in overall building footprint (for each building) by 48sq.m; DUB 14; DUB 15, change to level of ground floor and associated increase in overall building height of approx; relocation, modifications to design and expansion of approved Water Treatment Building and associated plant to include, Water Treatment Tanks, 2 sprinkler tanks and relocated approved pump house and 1 generator with additional proposed flue stack and 1 transformer; Relocation & reconfiguration of previously approved gas generator compound including, additional 4 generators omission of approved E-houses; additional 7 electrical rooms, additional 7 flues; modifications to approved layout of internal site roads, yards and footpaths; relocation and modifications to design of approved Sprinkler Tanks and Pump Houses, Pump House serving DUB 14, relocated into proposed Water Treatment Building and compound, redesign of approved larger tank into proposed two smaller tanks;; relocation of Approved Gas Networks Ireland (GNI) gas skid & compound including approved 3 kiosk buildings; the remainder of the development (including permitted temporary construction car parking) to be carried out in accordance with parent permission SD20A/0283.	No potential for in-combination effects given the scale and location of the project.

Planning Ref.	Description of development	Comments
SD22A/0007	The permanent continuation of use of the following existing buildings and structures: a prefabricated office; prefabricated canteen facilities water holding tank; 4 aggregate ground storage bays; power house; and weighbridge, all previously permitted for a five year period under Pl. Ref. SD17A/0218.	No potential for in-combination effects given the scale and location of the project.
SD22A/0022	The construction of a 2-storey extension and any associated site works to the south elevation of the existing engineering stores in the administration offices building.	No potential for in-combination effects given the scale and location of the project.
SD22A/0025	Retention and use for a further two years of the temporary gas powered generation plant, which was permitted initially for a period of three years under Reg Ref. SD16A/0345 and was subsequently extended for an additional period of 2 years from the 4th February 2020 under Condition no. 2 of permission granted under SD19A/0342	No potential for in-combination effects given the scale and location of the project.

The South Dublin County Development Plan in complying with the requirements of the Habitats Directive requires that all Projects and Plans that could affect the Natura 2000 sites in the same potential Zone of Influence of the Proposed Development site would be initially screened for Appropriate Assessment and if requiring Stage 2 AA, that appropriate employable mitigation measures would be put in place to avoid, reduce or ameliorate negative impacts. In this way any, in-combination impacts with Plans or Projects for the proposed development area and surrounding townlands in which the proposed development site is located, would be avoided.

The listed developments have been granted permission in most cases with conditions relating to sustainable development by the consenting authority in compliance with the relevant Local Authority Development Plan and in compliance with the Local Authority requirement for regard to the Habitats Directive. The development cannot have received planning permission without having met the consenting authority requirement in this regard. There are no predicted in-combination effects given that it is predicted that the Proposed Development will have no effect on any European site.

There are no predicted in-combination effects given that the reasons discussed in the 'Comments' column of the Table above and given that the Proposed Development is unlikely to have any adverse effects on any European sites.

Any new applications for the Proposed Development area will be assessed on a case by case basis *initially* by South DublinCounty Council which will determine the requirement for AA Screening as per the requirements of Article 6(3) of the Habitats Directive.

THE ASSESSMENT OF SIGNIFICANCE OF EFFECTS

Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site.

There is no connectivity to any European sites within or outside the potential Zone of Influence.

Explain why these effects are not considered significant.

There are no predicted effects on any European sites given:

- The distance between the Proposed Development and any European Sites, approximately 4km;
- The lack of connectivity between the Proposed Development and any hydrological pathways; there are no watercourses within the Proposed Development boundary and there is no connectivity between the Proposed Development site and any watercourses that lead to any European sites;
- The Proposed Development is to be connected to the existing public sewer network for the treatment of wastewater.
- There are no predicted emissions to air, water or the environment during the construction or operational phases that would result in significant effects

List of agencies consulted: provide contact name and telephone or e-mail address

The requirement for Appropriate Assessment Screening was determined during pre-planning discussion with South Dublin County Council.

Response to consultation

N/A.

DATA COLLECTED TO CARRY OUT THE ASSESSMENT

Who carried out the assessment

Moore Group Environmental Services.

Sources of data

NPWS database of designated sites at www.npws.ie

National Biodiversity Data Centre database http://maps.biodiversityireland.ie

Level of assessment completed

Desktop Assessment. Fieldwork was carried out as part of the EIA process.

Where can the full results of the assessment be accessed and viewed

An Bord Pleanála web portal.

OVERALL CONCLUSIONS

There is no connectivity to any European sites within or outside the potential Zone of Influence.

There are no predicted effects on any European sites given:

- The distance between the Proposed Development and any European Sites, approximately 4km;
- The lack of connectivity between the Proposed Development and any hydrological pathways; there are no watercourses within the Proposed Development boundary and there is no connectivity between the Proposed Development site and any watercourses that lead to any European sites;
- The Proposed Development is to be connected to the existing public sewer network for the treatment of wastewater.
- There are no predicted emissions to air, water or the environment during the construction or operational phases that would result in significant effects.

It has been objectively concluded by Moore Group Environmental Services that:

1. The Proposed Development is not directly connected with, or necessary to the conservation management of the European sites considered in this assessment.
2. The Proposed Development is unlikely to either directly or indirectly significantly affect the Qualifying interests or Conservation Objectives of the European sites considered in this assessment.
3. The Proposed Development, alone or in combination with other projects, is not likely to have significant effects on the European sites considered in this assessment in view of their conservation objectives.
4. It is possible to conclude that significant effects can be excluded at the screening stage.

It can be *excluded*, on the basis of objective information, that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on a European site.

An appropriate assessment is not, therefore, required.

8.0 AIR QUALITY & CLIMATE

8.1 INTRODUCTION

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' (2022) and the EPA 'Advice Notes for Preparing Environmental Impact Statements' (2022).

The proposed development comprises the provision of approximately 2.5km of 110kV underground transmission line between the proposed Kishoge 110kv Gas Insulated switchgear (GIS) substation to the permitted Aungierstown – Castlebaggot underground 110kV transmission line. The proposed and permitted developments are separated by industrial buildings, greenfield lands, and roadways.

8.2 METHODOLOGY

8.2.1 Criteria for Rating of Impacts

8.2.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, 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 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 8.1).

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 the pollutants PM_{10}, and $PM_{2.5}$ 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) and also includes ambient limit values relating to $PM_{2.5}$.

Pollutant	Regulation [Note 1]	Limit Type	Value
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

Table 8.1 Air Quality Standards Regulations 2011 (based on EU Council Directive 2008/50/EC)

8.2.1.2 Dust Deposition Guidelines

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 in section 8.2.1.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

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.

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/(m2*day) averaged over a one year period at any receptors outside the site boundary. Recommendations from the Department of the Environment, Health & Local Government (DOEHLG, 2004) apply the Bergerhoff limit of 350 mg/(m2*day) to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the proposed development.

8.2.1.3 Gothenburg Protocol

In 1999, Ireland signed the Gothenburg Protocol to the 1979 UN Convention on Long Range Transboundary Air Pollution. The initial objective of the Protocol was to control and reduce emissions of Sulphur Dioxide (SO_2), Nitrogen Oxides (NO_X), Volatile Organic Compounds (VOCs) and Ammonia (NH_3). To achieve the initial targets Ireland was obliged, by 2010, to meet national emission ceilings of 42 kt for SO_2 (67% below 2001 levels), 65 kt for NO_X (52% reduction), 55 kt for VOCs (37% reduction) and 116 kt for NH_3 (6% reduction). In 2012, the Gothenburg Protocol was revised to include national emission reduction commitments for the main air pollutants to be achieved in 2020 and beyond and to include emission reduction commitments for $PM_{2.5}$.

European Commission Directive 2001/81/EC and the National Emissions Ceiling Directive (NECD), prescribes the same emission limits as the 1999 Gothenburg Protocol. A National Programme for the progressive reduction of emissions of four of these transboundary pollutants has been in place since April 2005. The data available from the EU in 2018 indicated that, in 2016, Ireland complied with the emissions ceilings for SO_2, VOCs and NH_3 but failed to comply with the ceiling for NO_X. Directive (EU) 2016/2284 “On the Reduction of National Emissions of Certain Atmospheric Pollutants and Amending Directive 2003/35/EC and Repealing Directive 2001/81/EC” was published in December 2016. The Directive will apply the 2010 NECD limits until 2020 and establish new national emission reduction commitments which will be applicable from 2020 and 2030 for SO_2, NO_X, NMVOC, NH_3, $PM_{2.5}$ and CH_4. In relation to Ireland, 2020-29 emission targets are 25 kt for SO_2 (65% on 2005 levels), 65 kt for NO_X (49% reduction on 2005 levels), 43 kt for VOCs (25% reduction on 2005 levels), 108 kt for NH_3 (1% reduction on 2005 levels) and 10 kt for $PM_{2.5}$ (18% reduction on 2005 levels). In relation to 2030, Ireland’s emission targets are 10.9 kt (85% below 2005 levels) for SO_2, 40.7 kt (69% reduction) for NO_X, 51.6 kt (32% reduction) for NMVOCs, 107.5 kt (5% reduction) for NH_3 and 11.2 kt (41% reduction) for $PM_{2.5}$.

8.2.1.4 Climate Agreements

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.

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.

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 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.

The Climate Action Plan (CAP) , 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.

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 followed by the publication of the 2021 Climate Bill in March 2021. The Climate Action and Low Carbon Development (Amendment) Act 2021 (the 2021 Climate Act) (No. 32 of 2021) was published in July 2021.

The purpose of the 2021 Climate Act is to provide for the approval of plans 'for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050'. The 2021 Climate Act will also 'provide for carbon budgets and a sectoral emissions ceiling to apply to different sectors of the economy'. The 2021 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. The Act has set a target of a 51% reduction in the total amount of greenhouse gases over the course of the first two carbon periods ending 31 December 2030 relative to 2018 annual emissions. The 2021 Climate Act defines the carbon budget as 'the total amount of greenhouse gas emissions that are permitted during the budget period'.

8.2.2 Construction Phase

8.2.2.1 Air Quality

The current assessment focuses on identifying the existing baseline levels of PM_{10} and $PM_{2.5}$ in the region of the proposed development by an assessment of EPA monitoring data. Thereafter, the impact of the construction phase of the development on air quality was determined by a qualitative assessment of the nature and scale of dust generating construction activities associated with the proposed development.

8.2.2.2 Climate

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.

8.2.3 Operational Phase

8.2.3.1 Air Quality

The assessment methodology involves air dispersion modelling using the UK Design Manual for Roads and Bridges Screening Model (UK Highways Agency, 2007) (Version 1.03c, July 2007), the NOx to NO2 Conversion Spreadsheet (UK DEFRA, 2016) (Version 5.1), and following guidance issued by Transport Infrastructure Ireland (TII, 2011), UK Highways Agency (2007), UK Department for Environment, Food and Rural Affairs (2016b) and the EPA (2002 & 2017a Draft; 2003 & 2022).

Transport Infrastructure Ireland guidance states that the assessment must progress to detailed modelling if:

- Concentrations exceed 90% of the air quality limit values when assessed by the screening method; or
- Sensitive receptors exist within 50m of a complex road layout (e.g. grade separated junctions, hills etc).

The UK Design Manual for Roads and Bridges guidance (UK Highways Agency 2007), on which Transport Infrastructure Ireland guidance was based, 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:

- Road alignment change of 5 metres or more;
- Daily traffic flow changes by 1,000 AADT or more;
- HGVs flows change by 200 vehicles per day or more;
- Daily average speed changes by 10 km/h or more; or
- Peak hour speed changes by 20 km/h or more.

None of the road links impacted by the proposed development satisfied any of the criteria outlined above, therefore no assessment using the DMRB model was required for the proposed development.

8.3 RECEIVING ENVIRONMENT

8.3.1 Meteorological Data

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.

The nearest representative weather station collating detailed weather records is Casement Aerodrome, which is located approximately 1.3 km southeast 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 8.1). For data collated during five representative years (2017 - 2021), the predominant wind direction is westerly to south-westerly, with generally moderate wind speeds averaging 5.3 m/s for the period 2017 - 2021.

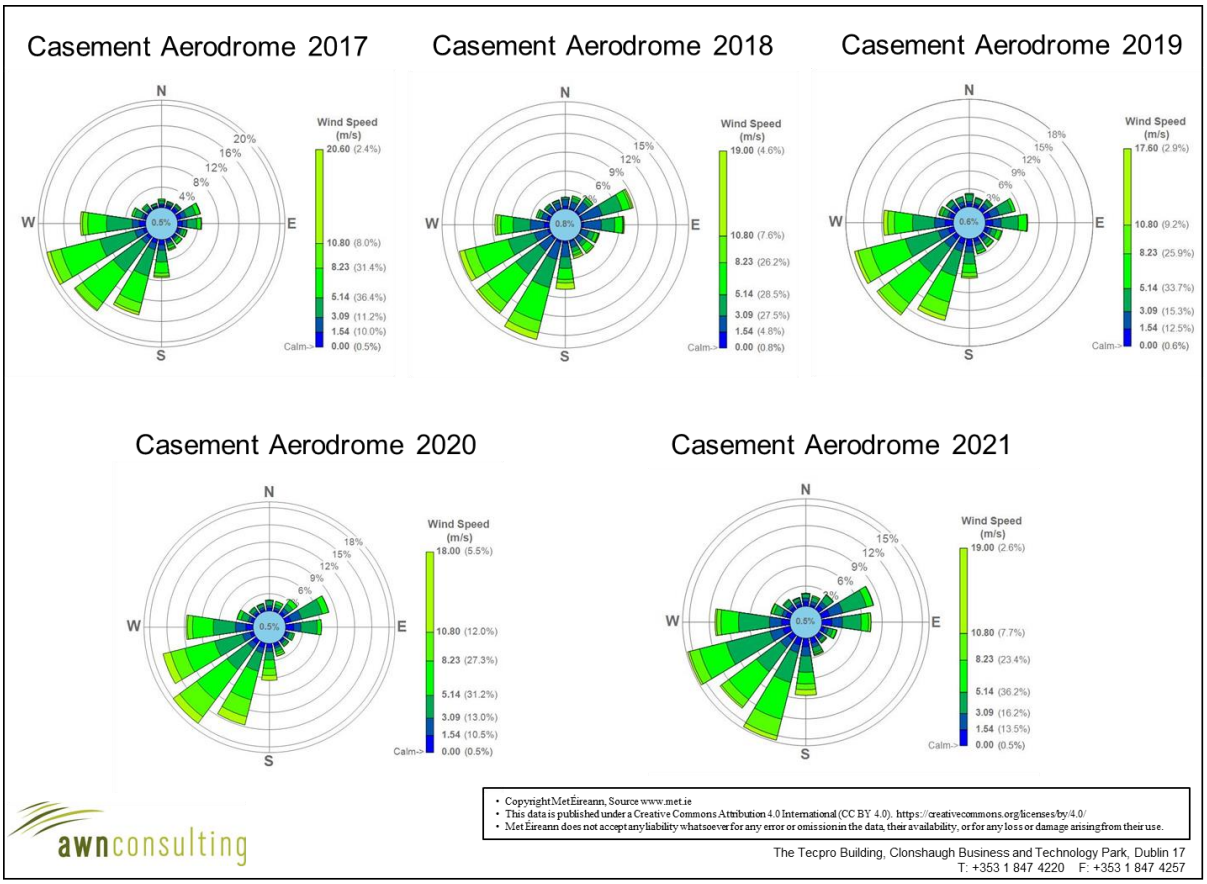

Figure 8.1 Casement Aerodrome Windrose 2017 – 2021

8.3.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality "Air Quality Monitoring Annual Report 2016" (EPA 2021) details the range and scope of monitoring undertaken throughout Ireland.

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 (EPA 2022). 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, Clonshaugh is categorised as Zone A (EPA 2018).

8.3.2.1 PM_{10}

Continuous PM_{10} monitoring carried out at the suburban background locations of Ballyfermot, Dún Laoghaire, Rathmines and Tallaght showed annual mean concentrations ranging from 11 – 15 µg/m^3 in 2019 (see Table 8.2), with at most 2 exceedances (in Rathmines) of the daily limit value of 50 µg/m^3 (35 exceedances are permitted per year) (EPA 2021). Sufficient data is available for all stations to observe trends over the period 2015 - 2019. Average annual mean PM_{10} concentrations ranged from 9 - 16 µg/m^3 over the period of 2015 – 2019, suggesting an upper average concentration of no more than 12.9 µg/m^3. PM_{10} results from the urban background location in the Phoenix Park show similarly low levels over the period of

2015 – 2019 with concentrations ranging from 9 – 12 µg/m^3. Based on these results, a conservative estimate of the background PM_{10} concentration in the region of the proposed development is 15 µg/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
Dún Laoghaire	Annual Mean PM_{10} (µg/m^3)	13	13	12	13	12
	24-hr Mean > 50 µg/m^3 (days)	3	0	2	0	2
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

Table 8.2 Trends In Zone A Air Quality - PM_{10}

8.3.2.2 $PM_{2.5}$

Continuous $PM_{2.5}$ monitoring carried out at the Zone A location of Rathmines showed an average concentrations ranging from 9 – 10 µg/m^3 over the 2015 – 2019 period, with a $PM_{2.5}/PM_{10}$ ration ranging from 0.60 – 0.68. Based on this information, a conservative ratio of 0.7 was used to generate a background $PM_{2.5}$ concentration in the region of the development of 10.5 µg/m^3.

8.3.3 Sensitivity of the Receiving Environment

In line with the UK Institute of Air Quality Management (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction'* (IAQM 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.

In terms of receptor sensitivity to dust soiling, there are less than 10 high sensitivity (residential) receptors are located less than 100 m from the proposed construction works (see Figure 8.2), which is considered a high sensitivity environment for dust soiling according to the IAQM criteria (2014) outlined in Table 8.3. Based on the IAQM criteria outlined in Table 8.3, the worst case sensitivity of the area to dust soiling is considered to be **low**.

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

Table 8.3 Sensitivity of the Area to Dust Soiling Effects on People and Property

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 15 µg/m^3 and there are less than 10 high sensitivity receptors located less than 100 m from the proposed construction works. Based on the IAQM criteria outlined in Table 8.4, the worst case sensitivity of the area to human health is considered to be **low**.

Receptor Sensitivity	**Annual Mean PM_{10} Concentration**	**Number Of Receptors**	**Distance from source (m)**			
			<20	**<50**	**<100**	**<200**
High	< 24 µg/m^3	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	< 24 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	< 24 µg/m^3	>1	Low	Low	Low	Low

Table 8.4 Sensitivity of the Area to Human Health Impacts

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area within 50 m of the proposed site to ecological impacts from dust. The criteria take into consideration whether the receiving environment is classified as a Special Area of Conservation (SAC), a Special Protected Area (SPA), a Natural Heritage Area (NHA) or a proposed Natural Heritage Area (pNHA) as dictated by the EU Habitats Directive or whether the site is a local nature reserve or home to a sensitive plant or animal species. There are no ecologically sensitive locations within 50 m of the site boundaries, therefore, based on the IAQM criteria, no assessment of the impact of dust on the ecosystem is required.

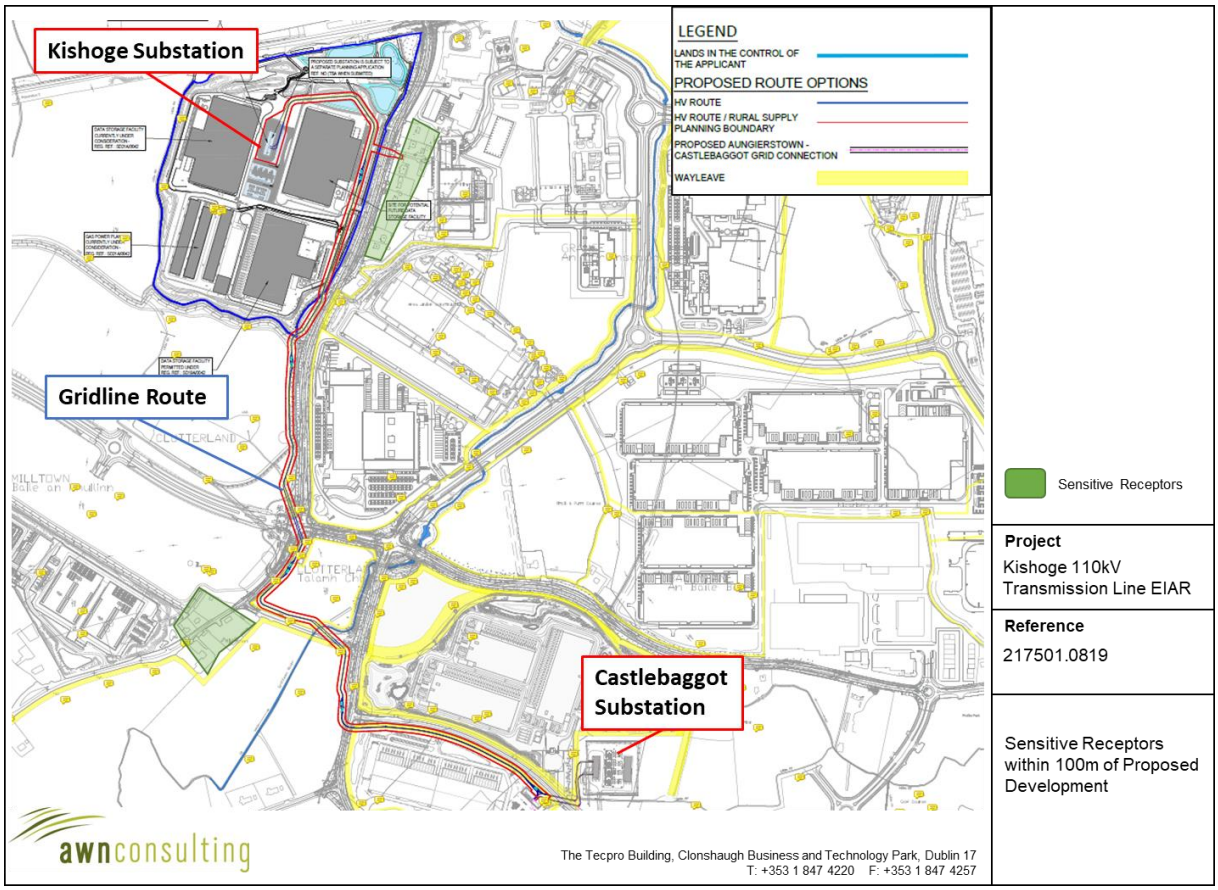

Figure 8.2 Sensitive Receptors within 100 metres of Proposed Development

8.4 CHARACTERISTICS OF THE DEVELOPMENT

8.4.1 Construction Phase

The proposed development comprises the provision of an underground transmission line between the Kishoge 110kv Gas Insulated switchgear (GIS) substation to the permitted Aungierstown – Castlebaggot underground 110kV transmission line. The developments are separated by industrial buildings, greenfield lands, and roadways. 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 during excavation for installation of the transmission line.
(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.

As outlined in Section 8.6, 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.

8.4.2 Operational Phase

There are no works during the operational phase which have a potential to impact on air quality or climate.

8.5 POTENTIAL IMPACTS OF THE DEVELOPMENT

8.5.1 Construction Phase

8.5.1.1 Air Quality

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 200m 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.

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 (see Section 8.6) of this chapter are implemented, fugitive emissions of dust from the site will not be significant and will pose no nuisance at nearby receptors.

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 (see Section 8.3.3). 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

There are no demolition activities associated with the proposed development. Therefore, there is no demolition impact predicted as a result of the works.

Earthworks

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 > 10,000 m^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 2,500 m^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 < 2,500 m^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.

The dust emission magnitude for the proposed earthwork activities can be classified as large as worst-case as the total site area will be greater than 10,000 m^2. However, it should be noted that this is a conservative assessment as soil will be excavated in stages and infilled following each stage of excavation.

The sensitivity of the area, as determined in Section 8.3.3, 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 8.5, this results in an overall **low risk** of temporary dust soiling impacts and an overall **low risk** of temporary human health impacts as a result of the proposed earthworks activities.

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

Table 8.5 Risk of Dust Impacts – Earthworks

Construction

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).

The dust emission magnitude for the proposed construction activities can be classified as medium at a worst-case as the total volume of trench for the cabling will be between 25,000 m^3 and 100,000 m^3 but there is not be any on-site concrete batching.

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 8.6, this results in an overall **low risk** of temporary dust soiling impacts and an overall **low risk** of temporary human health impacts as a result of the proposed construction activities.

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

Table 8.6 Risk of Dust Impacts – Construction

Trackout

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 heavy duty vehicles (HDV) (> 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 HDV (> 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 HDV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

The dust emission magnitude for the proposed trackout can be classified as small, as there are unlikely to be greater than 10 HDV movements per day.

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 8.7, this results in an overall **negligible risk** of temporary dust soiling impacts and an overall **negligible risk** of temporary human health impacts as a result of the proposed trackout activities.

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

Table 8.7 Risk of Dust Impacts – Trackout

8.5.1.2 Summary of Dust Emission Risk

The risk of dust impacts as a result of the proposed development are summarised in Table 8.8 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.

Overall, in order to ensure that no dust nuisance occurs during the earthworks, construction and trackout activities, a range of dust mitigation measures associated with a **low** risk of dust impacts must be implemented. When the dust mitigation measures detailed in the mitigation section of this chapter (Section 8.6) are implemented, fugitive emissions of dust from the site will be insignificant and pose no nuisance at nearby receptors.

Potential Impact	**Dust Emission Magnitude**			
	Demolition	**Earthworks**	**Construction**	**Trackout**
Dust Soiling	-	Low Risk	Low Risk	Negligible Risk
Human Health	-	Low Risk	Low Risk	Negligible Risk

Table 8.8 Summary of Dust Impact Risk used to Define Site-Specific Mitigation

8.5.1.3 Climate

Construction traffic would be expected to be the dominant source of greenhouse gas emissions as a result of the proposed development. Construction vehicles and machinery will give rise to CO_2 and N_2O emissions during construction of the proposed development.

Due to the short duration and nature of the construction activities, CO_2 and N_2O emissions from construction vehicles and machinery will have a ***short-term*** and ***imperceptible*** impact on climate.

8.5.2 Operational Phase

8.5.2.1 Air Quality & Climate

There are no potential impacts associated with the proposed development during the operational stage as the transmission line will be buried underground.

8.6 REMEDIAL AND MITIGATION MEASURES

8.6.1 Construction Phase

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 (IAQM (2014), The Scottish Office (1996), UK Office of Deputy Prime Minister (2002) and BRE (2003)) and the USA (USEPA (1997)).

8.6.1.1 Site Management

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.

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 8.1 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.

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;
- At all times, the procedures put in place will be strictly monitored and assessed.

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.

8.6.1.2 Site Roads / Haulage Routes

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).

- 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 shall 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 shall 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.

8.6.1.3 Land Clearing / Earth Moving

Land clearing / earth-moving works during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance,

watering shall 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 should be postponed until the gale has subsided.

8.6.1.4 Storage Piles

- The location and moisture content of storage piles are important factors which determine their potential for dust emissions.
- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles should 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);
- 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.

8.6.1.5 Site Traffic on Public Roads

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 shall be installed if feasible. 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.

8.6.1.6 Summary of Dust Mitigation Measures

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.

8.6.2 Operational Phase

There are no predicted impacts for the operational phase of the proposed development and therefore, no additional mitigation measures are proposed.

8.7 Cumulative Impacts

Construction Phase

Construction is currently being completed on the permitted datacentre on the adjacent site and at other sites within the wider area (ref Table 2.1 and developments outlined in Chapter 3). According to the IAQM guidance (IAQM, 2014) should the construction phase of the proposed development coincide with the construction phase of any other development within 350m then there is the potential for cumulative construction dust impacts. 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. It is standard construction practice that these measures are incorporated into a construction environmental management plan (CEMP). Provided these mitigation measures are in place for the duration of the construction phase cumulative dust related impacts to nearby sensitive receptors are not predicted to be significant. Cumulative impacts to air quality and human health will be ***short-term***, ***localised***, ***negative*** and ***not significant***.

Due to the short-term duration of the construction phase and the low potential for significant CO_2 and N_2O emissions cumulative impacts to climate are considered ***neutral***.

Operational Phase

There are no operational emissions from the proposed development, therefore the cumulative impact is predicted to be ***long-term***, ***neutral*** and ***imperceptible*** with regards to air quality, climate and human health.

8.8 RESIDUAL IMPACTS OF THE DEVELOPMENT

8.8.1 Construction Phase

8.7.1.1 Air Quality

When the dust mitigation measures detailed in the mitigation section (section 8.6.1) of this report and in the construction environmental management plan (CEMP) are implemented, fugitive emissions of dust and particulate matter from the site will be ***short-term, negative*** and ***not significant*** in nature, posing no nuisance at nearby receptors.

8.7.1.2 Climate

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 ***neutral***, ***short-term*** and ***not significant*** in relation to Ireland's obligations under the EU 2020 target.

8.7.1.3 Human Health

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 ***negative***, ***short-term*** and ***imperceptible*** with respect to human health.

8.8.2 Operational Phase

8.7.2.1 Air Quality & Climate

There are no predicted impacts to air quality or climate during the operational phase of the proposed development. Therefore, the operational phase is considered ***neutral, long-term*** and ***imperceptible*** for both air quality, climate and human health.

If the mitigation measures outlined in Section 8.6 are implemented, there will be no residual impacts of significance on air quality or climate from the construction or operational phases of the proposed development.

8.9 DO NOTHING SCENARIO

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 which 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.

8.10 MONITORING

8.10.1 Construction Phase

There is no monitoring recommended for the construction phase of the proposed development. Once the mitigation measures outlined within this chapter are implemented impacts are predicted to be ***short-term* and *not significant*.**

8.10.2 Operational Phase

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be neutral.

8.11 REFERENCES

- BRE (2003) Controlling Particles, Vapours & Noise Pollution From Construction Sites
- DEHLG (2004) National Programme for Ireland under Article 6 of Directive 2001/81/EC for the Progressive Reduction of National Emissions of Transboundary Pollutants by 2010
- DEHLG (2007) Update and Revision of the National Programme for Ireland under Article 6 of Directive 2001/81/EC for the Progressive Reduction of National Emissions of Transboundary Pollutants by 2010
- European Council (2014) European Council (23 and 24 October 2014) Conclusions on 2030 Climate and Energy Policy Framework, SN 79/14
- EEA (2014) NEC Directive Status Reports 2013
- EPA (2017) Guidelines on the Information to be contained in Environmental Impact Statements - Draft August 2017
- EPA (2021) Air Quality in Ireland 2020 (and previous reports)
- EPA (2022) EPA Website: https://www.epa.ie/our-services/monitoring--assessment/
- EPA (2022) Notes for Preparing Environmental Impact Statements
- ERM (1998) Limitation and Reduction of CO_2 and Other Greenhouse Gas Emissions in Ireland
- Framework Convention on Climate Change (FCCC) (1997) Kyoto Protocol To The United Nations Framework Convention On Climate Change
- FCCC (1999) Ireland - Report on the in-depth review of the second national communication of Ireland
- German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft
- IAQM (2014) Guidance on the Assessment of Dust from Demolition and Construction
- The Scottish Office (1996) Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings
- UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance
- USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures

9.0 NOISE & VIBRATION

As described in Chapter 1 (Introduction), the Applicant is applying to An Bord Pleanála for planning permission provision of underground 110kV transmission line connections between the Kishoge 110kv Gas Insulated switchgear (GIS) substation on a site within the townland of Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin, and the permitted Aungierstown – Castlebaggot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnel, Dublin 22. The proposed transmission lines provide for a loop-in connection to the permitted Aungierstgown – Castlebaggot transmission line.

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

9.1 Methodology

9.1.1 Proposed Approach

The following methodology has been adopted for this assessment:

- review appropriate guidance and planning conditions applicable to the associated site, etc. in order to identify appropriate noise criteria for the site operations;
- review 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;
- calculate construction noise levels associated with the key construction activities to consider the potential noise impact of the proposed development, and;
- comment on predicted levels against the appropriate criteria and existing noise levels and outline required mitigation measures (if any).

Appendix 9.1 of this 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.

9.1.2 Fundamentals of Acoustics

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.

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).

The audible range of sounds expressed in terms of Sound Pressure Levels is 0dB (for the threshold of hearing) to 120dB (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 10dB 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.

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 250Hz. 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.

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.

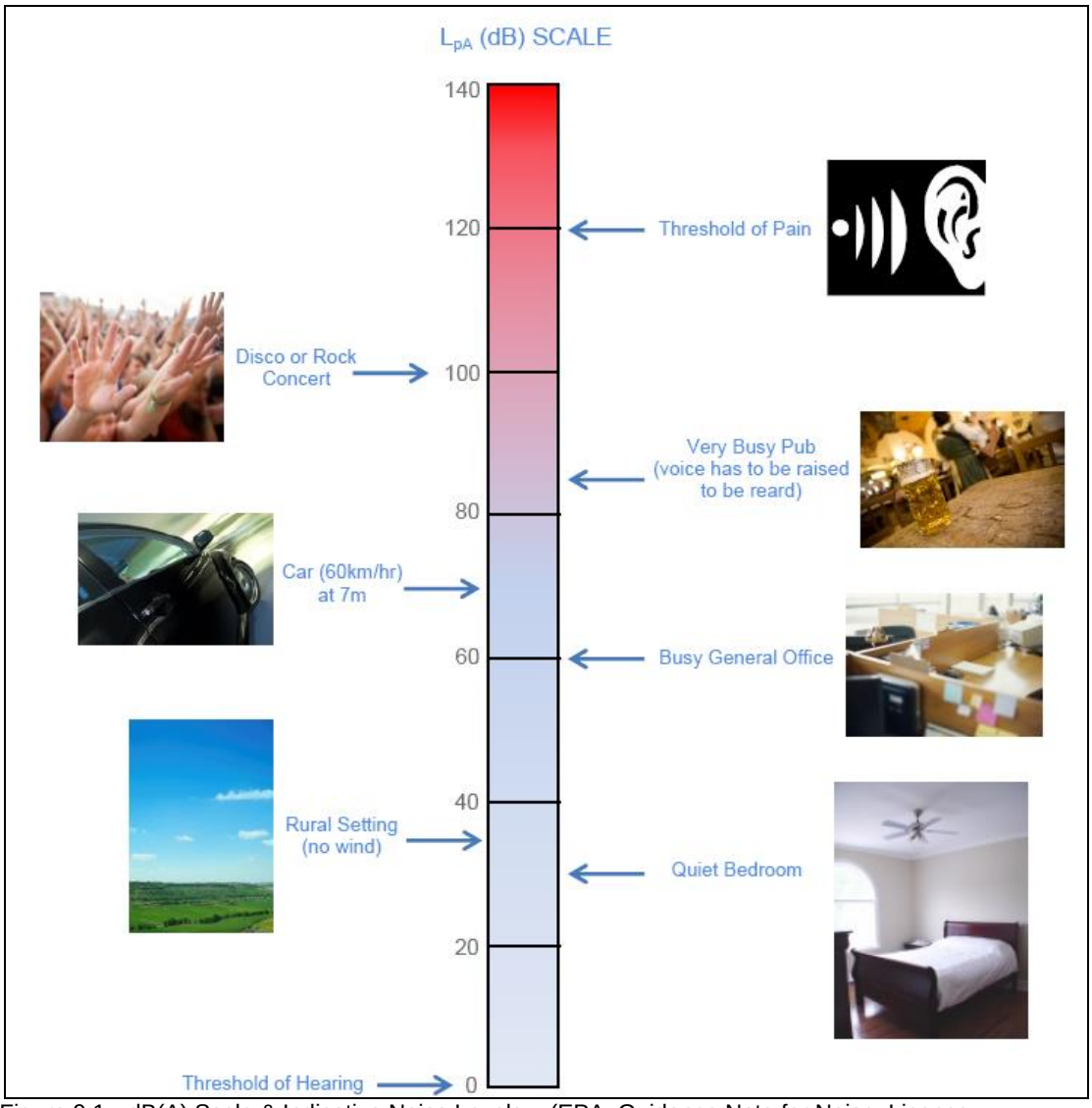

Figure 9.1 dB(A) Scale & Indicative Noise Levels – (EPA: Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4 – 2016))

9.1.3 Significance of Impacts

The significance of noise and vibration impacts has been assessed in accordance with the EPA's Guidelines on the Information to be contained in Environmental Impact Assessment Reports 2022 and the EPA's Draft Advice Notes for Preparing

Environmental Impact Statements 2015, see Table 9.1 to Table 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).

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

Table 9.1 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).

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

Table 9.2 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.

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

Table 9.3 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

9.2 Construction Phase Guidance

9.2.1 Criteria for Rating Noise Impacts

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.

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*.

The approach adopted in BS 5228 – 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.

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 9.4 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.

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

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

Table 9.5 Rounded Baseline Noise Levels and Associated Categories

Period	**Baseline Noise Category**	**Construction Noise Threshold Value $L_{Aeq,T}$ (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

If the construction noise level exceeds the appropriate category value, then a potential significant effect is deemed to occur.

The assessment process outlined above determines if a potential 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*[1], which should not be exceeded at noise sensitive locations during the construction phase of the development. Table 9.6 sets out these levels.

Table 9.6 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.

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

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:

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

9.2.2 Criteria for Rating Vibration Impacts

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).

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. This guidance is applicable to the daytime only; it is unreasonable to expect people to be tolerant of such activities during the night.

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*.

BS 7385 states that there should typically be no cosmetic damage if transient vibration does not exceed 15 mm/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.

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

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 cosmetic 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.

The Transport Infrastructure Ireland (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 9.7 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 10 Hz	**10 to 50 Hz**	**50 to 100 Hz (and above)**
8 mm/s	12.5 mm/s	20 mm/s

9.2.3 Operational Phase – Noise Guidance

Due to the fact that the proposed 110kV lines will be located underground there are is no operational operation noise impact associated with the Proposed Development.

9.2.3.1 Operational Phase – Vibration Guidance

There will be no vibration emissions from the operation of the proposed cable installation. Consequently, there is no requirement to assess any vibration emissions.

9.2.3.2 Forecasting Methods

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.*

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.

9.3 Receiving Environment

In this instance, the noise survey carried out by AWN Consulting in the preparation of the planning application for the DUB05 Data Centre provides information on existing noise levels in the area and is referred to here.

The survey was conducted in general accordance with ISO 1996: 2017 Acoustics – *Description, Measurement and Assessment of Environmental Noise*. Specific details are set out below.

9.3.1 Monitoring locations

Noise measurements were conducted at five positions on and in the vicinity of the site that are representative of noise environment expected at the nearest noise sensitive locations. Details for the particular locations are outlined below:

Location S01 Located in the north eastern corner of the site in line with the common boundary of the nearest noise sensitive locations at the junction of the R120 and the Grand Canal.

Location S02 Located on the south western corner of the site along with the common boundary of a nearby noise sensitive location. The location is representative of the row of noise sensitive locations that along the R120 beyond the western boundary of the proposed development.

Location S03 Located in the vicinity of a residential location to the north east of the proposed development site. The property is located on the boundary of the Grange Castle Business Park and is immediately adjacent to a number of commercial premises.

Location S04 Located in the north eastern concern of the development lands. This location is considered to be representative of noise levels currently experienced in the vicinity of the residential properties on the Grand Canal to the north.

Location S05 Located in the south western concern of the development lands. The location is considered to be representative of noise levels currently experienced in the vicinity of the halting site located to the south west at some 200 m distance.

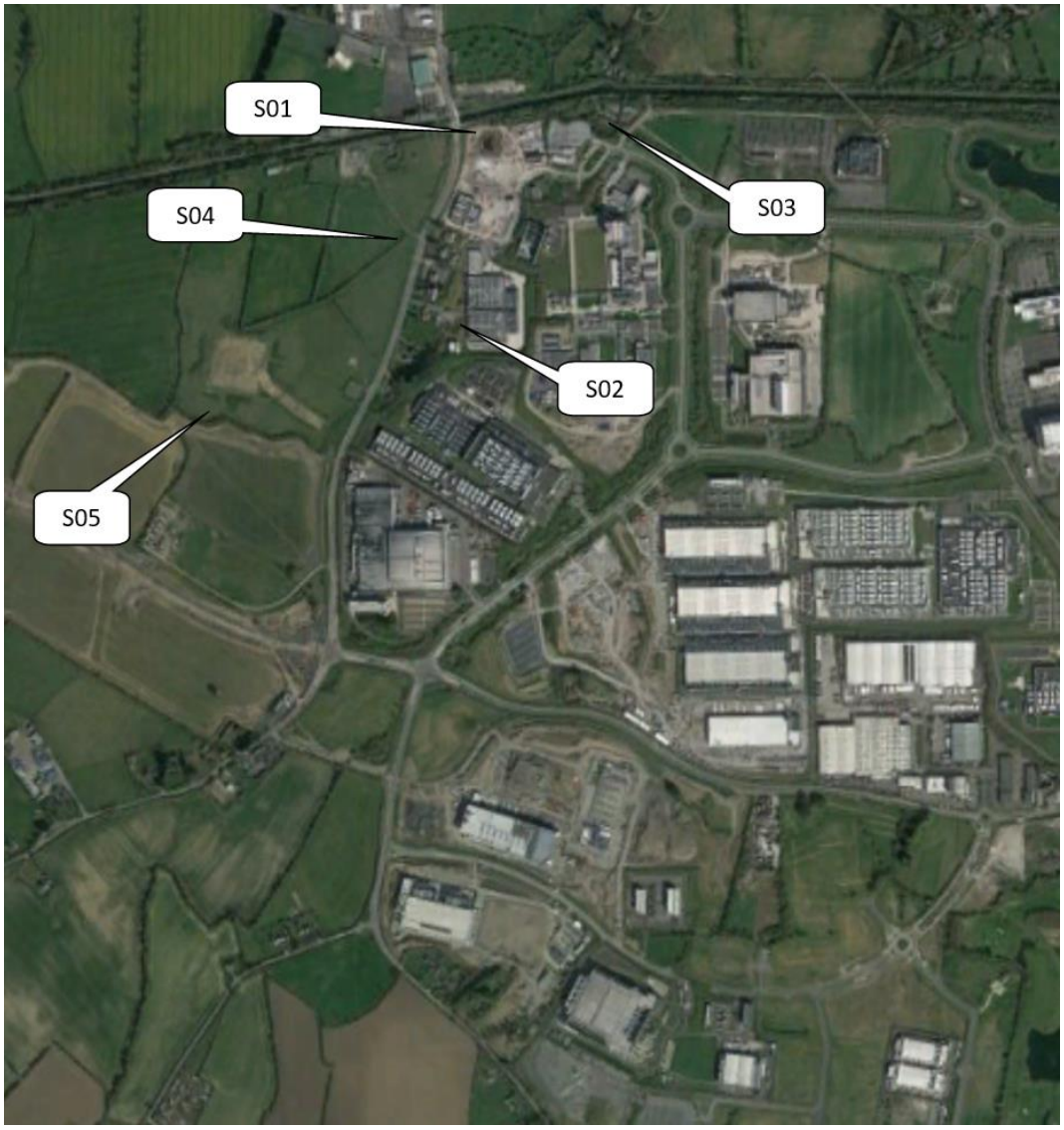

Figure 9.2 Site plan indicating baseline noise monitoring locations (Background Imagery Source: Google Earth)

A review of daytime, evening and night time noise levels at the monitoring locations are presented in Table 9.8. See Appendix 9.2 for further details.

Table 9.8 Review of noise levels

Location	Period	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)		
		$L_{Aeq,15min}$	L_{AFMax}	$L_{A90,15min}$
S01	Day	58 – 61	76	44 – 47
	Evening	53	63	45
	Night	48 – 49	67	42 – 43
S02	Day	48 – 49	73	41 – 43
	Evening	44	61	41
	Night	40 – 41	63	38 – 39
S03	Day	52 – 53	76	47 – 48
	Evening	51	68	49
	Night	49 – 51	70	48
S04	Day	51 – 62	78	42 - 57
	Evening	48 – 62	87	39 – 50
	Night	42 – 61	79	37 – 55

Location	Period	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)		
		$L_{Aeq,15min}$	L_{AFMax}	$L_{A90,15min}$
S05	Day	39 – 56	77	37 – 52
	Evening	37 – 51	76	34 – 50
	Night	36 – 50	65	32 – 48

In terms of the various locations the following significant noise sources (in subjective order of influence) were noted:

Table 9.9 Significant noise sources

Location	
S01	S02
• R120 road traffic noise. • Water running in a nearby canal in absence of traffic. • Site work and plant noise associated with existing sites. • During evening period noise dominated by traffic and water noise associated with the canal. • During night time plant noise from existing facilities (to the East and South) is the dominant background source.	• Plant noise from facility to the south. • Noise from existing site including impulsive noise (bangs) and reverse alarms. • Dogs barking and birdsong. • During the evening distant traffic noise and plant noise noted. • During night time existing plant noise from southern existing facilities is the dominant source. Distant traffic also noted.
Location	
S03	S04
• Noise dominated by existing plant noise from adjacent facility. • Occasional bus passing by. • Water flow from nearby watercourse. • Reverse alarms and construction noise from nearby site. • As above for evening period with the exception of construction noise. • During night time plant noise from the adjacent facility and water flow from nearby watercourse noted.	• R120 road traffic noise. • Water flow from nearby watercourse. • During night time plant noise from the adjacent facility and water flow from nearby watercourse noted.
Location	
S05	
• R120 road traffic noise. • Water flow from nearby watercourse. • During night time plant noise from the adjacent facility and water flow from nearby watercourse noted.	

It should be noted that the noise criteria applied for this stage of the development are based on noise data and assessment obtained before the Phase 1 site was operational and/or considered planning conditions issued for previous phases by the local authority and/or An Bord Pleanála (ABP) and therefore addresses any concern of 'background creep' and is considered a suitably conservative approach.

9.4 Characteristics of the Proposed Development

A variety of items of plant will be in use for the purposes of site preparation, construction and site works. 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 Kishoge 100kV GIS substation to the permitted Aungierstgown – Castlebaggot transmission line 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 120 m of the underground cabling per day;
- The excavators will open a trench, the trench will be a maximum of 600 mm wide;
- Clay plugs will be installed at 50 m 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.

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.

Once operational, there will be no significant off-site noise emissions from the operation of the cable installations and associated cable bays.

These issues are discussed in detailed in the following sections.

9.5 Potential impact of the proposal

9.5.1 Construction phase

Construction noise predictions have been carried out using guidance set out in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise.

Construction works associated with the underground cable will be temporary in duration. It is estimated that the civil works will take approximately c. 10 months with a further 2 months estimated for cable installation, jointing and testing. To note the excavation and reinstatement will be ongoing in sections as the project proceeds.

Table 9.10 outlines the noise levels associated with typical construction noise sources assessed in this instance along with typical sound pressure levels from *BS 5228 – 1: 2009+A1:2014* at various distances from these works.

Table 9.10 Indicative Noise Levels from Construction Plant at Various Distances from the cable

Item (BS 5228 Ref.)	Highest Predicted Noise Level at Stated Distance from Edge of Works (dB $L_{Aeq,1hr}$)			
	20m	30m	50m	100m
Road breaker (hand-held pneumatic) (C5.3)	74	70	66	60
Wheeled Loader Lorry (C2.28)	68	64	60	54
Tracked Excavator (C.4.64)	67	63	59	53
Dozer (C2.13)	70	66	62	56
Dump Truck (C4.2)	70	66	62	56
Asphalt Spreader (C5.30)	67	63	59	53
Compressor (C3.19)	67	63	59	53
Vibratory Roller (C5.25)	67	63	59	53
Directional Drilling (Generator) (C2.44)	69	65	61	55
HGV Movements (10 per hour)	53	49	45	39

Note * Assume noise control measures as outlined in Table B1 of BS 5228 – 1 (i.e. fit acoustic exhaust).

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 will not be a material issue.

The noise levels presented in Table 9.10 are within the weekday daytime construction noise limit values shown in Table 9.6, at distances of 20m or greater from the works, with the exception of rock breaking. At distances greater than 30m from the works, the construction activities are predicted to be below the 70dB $L_{Aeq,1hr}$ construction noise criterion adopted. A significant effect is therefore not predicted in relation to the nearest noise sensitive locations at these distances in terms of this aspect of potential construction noise. The closest noise sensitive location is in the vicinity of noise monitoring Location B at some 25m distance from the line of the proposed underground line installation.

Note that next closest residential noise sensitive property in the vicinity of the proposed works are at a distance of some 250 m to the west, i.e. the halting site to the west of the R120.

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.

In terms of noise associated with the construction activities for the proposed development the associated effect is stated to be ***negative*** and ***slight***.

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.

9.5.1.1 Construction Traffic

In terms of the additional construction traffic on local roads that will be generated as a result of this development the following comment is presented. In order to increase traffic noise levels by 1 dB traffic volumes would need to increase by the order of 25% along the local road network. As outlined in the relevant sections of Chapter 12 relating to traffic, additional traffic introduced onto the local road network due to the construction phase of the Proposed Development will not result in a significant noise impact.

9.5.1.2 Review of Construction Impacts

In terms of noise associated with these construction activities the associated effect is stated to be:

Quality	***Significance***	***Duration***
Negative	Slight	Temporary/Short term

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	Temporary/Short term

9.5.2 Operational Phase

Due to the fact that the proposed 110kV lines will be located underground there are is no operational operation noise impact associated with the Proposed Development. Mmitigation measures are therefore not required.

The resultant noise effect is ***neutral***, ***imperceptible*** and ***long-term***.

Quality	***Significance***	***Duration***
Neutral	*Imperceptible*	*Long Term*

9.6 Remedial and mitigation measures

In order to sufficiently ameliorate the likely noise impact, a schedule of noise control measures has been formulated for the construction. No mitigation is required for operational phase.

9.6.1 Construction phase

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.

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.

The vibration from construction activities to off-site residences will be limited to the values set out in Table 9.7. It should be noted that these limits are not absolute rather they 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%.

Appendix 9.3 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 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 that have an increased potential in giving rise to issues off site.

9.6.2 Operational Phase

Due to the fact that the proposed 110kV lines will be located underground there is no operational operation noise impact associated with the Proposed Development. Mitigation measures are therefore not required.

9.7 Predicted impacts of the development

This section summarises the likely noise and vibration impact associated with the proposed development, taking into account the mitigation measures.

9.7.1 Construction phase

During the construction phase of the proposed development there will be some impact on nearby noise sensitive properties due to noise emissions from site traffic and other activities. The application of noise limits and hours of operation (i.e. as per Table 9.6, along with implementation of appropriate noise and vibration control measures (as summarised in Section 9.6.1), will ensure that noise and vibration impact is kept to a minimum. Also, it is reiterated that any construction noise impacts will be ***slight, negative*** and ***short-term*** in nature.

9.7.2 Operational phase

As the proposed 110kV lines will be located underground there is no operational operation noise impact associated with the Proposed Development.

The resultant noise impact is ***neutral, imperceptible*** and ***long-term.***

9.8 Cumulative Impact Assessment

There are no operational noise and/or vibration impacts associated with the Proposed Development, hence cumulative impacts do not arise in this instance.

The environmental noise survey takes account of noise emissions from existing operating developments, as such these already considered within the baseline assessment. It was noted that the existing ambient noise levels in the area were dominated primarily by road traffic on the surrounding road network. Background noise levels were influenced by distant traffic and degree of existing plant noise from existing facilities.

During construction of the Proposed Development it is anticipated that noise and vibration associated with construction work on the proposed cable installation routes, cable bays and substation will typically be lower than those generated by existing traffic movements on the local road network. The noise environments at the nearest noise sensitive locations to the proposed works are and will continue to be dominated by road traffic noise.

Construction is currently being completed on the permitted datacentre on the adjacent site and at other sites within the wider area (committed developments as listed in Table 2.1 and other developments as outlined in Chapter 3.). Whilst construction noise from these sites is potentially significant at locations in close proximity to them, the construction noise associated with them will effectively be masked by the existing traffic noise at the nearest noise sensitive locations identified in this assessment. Such works would not be expected to increase ambient noise levels in the vicinity of the noise sensitive locations that are in the proximity of the works under consideration here. All sites will be expected to work within conditioned and or best practice noise and vibration limits such that the associated noise and vibration impacts and managed. Based on this it is reiterated that any cumulative construction noise impacts will be ***slight, negative*** and ***temporary*** in nature.

9.9 Residual impacts

The construction noise 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, subject to the implementation of the mitigation measures outlined in Section 9.56.
There are no operational noise and/or vibration impacts associated with the Proposed Development. Ambient noise levels are, and will continue to be, dictated by road traffic noise in the area while a low level of plant noise is expected to be audible during lulls in other sources (e.g. distant traffic noise).

The operational noise assessment of vehicle movements associated with the site has shown that in accordance with the scale in the EPA EIA Report Guidelines 2022 there will be an ***imperceptible, neutral, long-term*** impact off site noise sensitive locations considering existing traffic volumes on the local road network.

9.10 Do-Nothing Scenario

The existing noise climate will remain unchanged on site and at nearby noise sensitive locations.

9.11 Monitoring

It is required that the appointed contractor monitor levels of noise and vibration during the construction phase at nearby sensitive locations and/or development site boundaries.

9.12 References

EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIA Reports) (2022) and draft revised Guidelines on information to be contained in Environmental Impact Statements; and Advice Notes for preparing EIS (2015).

- '*Guidelines for Environmental Noise Impact Assessment*' produced by the Institute of Environmental Management and Assessment (IEMA) (2014).
- *British Standard BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise*.
- Transport Infrastructure Ireland (TII) publication *Guidelines for the Treatment of Noise and Vibration in National Road Schemes.*
- British Standard BS 7385: 1993: *Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration*.
- British Standard BS 5228-2: 2009+A1:2014: *Code of practice for noise and vibration control on construction and open sites – Vibration*.
- BS 4142:2014+A1:2019: *Methods for rating and assessing industrial and commercial sound.*
- BS 8233:2014: *Guidance on sound insulation and noise reduction for buildings.*
- Environmental Protection Agencies *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)* (January 2016).
- ISO 1996-2:2017 *Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels.*
- British Standard *BS 6472 (1992): Guide to Evaluation of human exposure to vibration in buildings (1Hz to 80Hz).*
- ISO 9613 (1996): *Acoustics – Attenuation of sound outdoors – Part 2: General method of calculation.*
- *Calculation of Road Traffic Noise (CRTN)* issued by the Department of Transport in 1988.

APPENDIX 9.1

GLOSSARY OF ACOUSTIC TERMINOLOGY

ambient noise	The totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far.
background noise	The steady existing noise level present without contribution from any intermittent sources. The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T ($L_{AF90,T}$).
broadband	Sounds that contain energy distributed across a wide range of frequencies.
dB	Decibel - The scale in which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the RMS pressure of the sound field and the reference pressure of 20 micro-pascals (20 μPa).
dB L_{pA}	An 'A-weighted decibel' - a measure of the overall noise level of sound across the audible frequency range (20 Hz – 20 kHz) with A-frequency weighting (i.e. 'A'–weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
Hertz (Hz)	The unit of sound frequency in cycles per second.
impulsive noise	A noise that is of short duration (typically less than one second), the sound pressure level of which is significantly higher than the background.
$L_{Aeq,T}$	This is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T). The closer the L_{Aeq} value is to either the L_{AF10} or L_{AF90} value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources such as traffic on the background.
L_{AFN}	The A-weighted noise level exceeded for N% of the sampling interval. Measured using the "Fast" time weighting.
L_{AFmax}	is the instantaneous slow time weighted maximum sound level measured during the sample period (usually referred to in relation to construction noise levels).
$L_{Ar,T}$	The Rated Noise Level, equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and impulsiveness of the sound.
L_{AF90}	Refers to those A-weighted noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to estimate a background level. Measured using the "Fast" time weighting.
L_{AT}(DW)	equivalent continuous downwind sound pressure level.
L_{fT}(DW)	equivalent continuous downwind octave-band sound pressure level.

L_{day} L_{day} is the average noise level during the daytime period of 07:00hrs to 19:00hrs

L_{night} L_{night} is the average noise level during the night-time period of 23:00hrs to 07:00hrs.

low frequency noise LFN - noise which is dominated by frequency components towards the lower end of the frequency spectrum.

noise Any sound, that has the potential to cause disturbance, discomfort or psychological stress to a person exposed to it, or any sound that could cause actual physiological harm to a person exposed to it, or physical damage to any structure exposed to it, is known as noise.

noise sensitive location NSL – Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.

octave band A frequency interval, the upper limit of which is twice that of the lower limit. For example, the 1,000Hz octave band contains acoustical energy between 707Hz and 1,414Hz. The centre frequencies used for the designation of octave bands are defined in ISO and ANSI standards.

rating level See $L_{Ar,T}$.

sound power level The logarithmic measure of sound power in comparison to a referenced sound intensity level of one picowatt (1pW) per m^2 where:

$$Lw = 10Log\frac{P}{P_0}\ \text{dB}$$

Where: p is the rms value of sound power in pascals; and
P_0 is 1 pW.

sound pressure level The sound pressure level at a point is defined as:

$$Lp = 20Log\frac{P}{P_0}\ \text{dB}$$

specific noise level A component of the ambient noise which can be specifically identified by acoustical means and may be associated with a specific source. In BS 4142, there is a more precise definition as follows: 'the equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval ($L_{Aeq,\,T}$)'.

tonal Sounds which cover a range of only a few Hz which contains a clearly audible tone i.e. distinguishable, discrete or continuous noise (whine, hiss, screech, or hum etc.) are referred to as being 'tonal'.

$^1/_3$ octave analysis Frequency analysis of sound such that the frequency spectrum is subdivided into bands of one–third of an octave each.

APPENDIX 9.2

BASELINE NOISE MONITORING

A series of environmental noise surveys were conducted in order to quantify the existing noise environment. The survey was conducted in accordance with *ISO/DIS 1996-2 Acoustics - Description, measurement and assessment of environmental noise -- Part 2: Determination of sound pressure levels (2015)*. Specific details are set out below.

Choice of noise monitoring locations

Noise measurements were conducted at three positions on the site boundary that are reflective of noise levels at the nearest noise sensitive locations and the common boundary with the Cuisine de France facility to the west. Details for the particular locations are outlined below:

Location S01 Located in the north western corner of the site in line with the common boundary of the nearest noise sensitive locations at the junction of the R102 and the Grand Canal.

Location S02 Located on the south western corner of the site along with the common boundary of a nearby noise sensitive location. The location is representative of the row of noise sensitive locations that along the R102 beyond the western boundary of the proposed development.

Location S03 Located in the vicinity of the nearest residential location to the north east of the proposed development site. The property is located on the boundary of the Grangecastle Business Park and is immediately adjacent a number of commercial activities.

Location S04 Located in the north eastern concern of the development lands. This location is considered to be representative of noise levels currently experienced in the vicinity of the residential properties on the Royal Canal to the north.

Location S05 Located in the south western concern of the development lands. The location is considered to be representative of noise levels currently experienced in the vicinity of the halting site located to the south west at some 200 m distance.

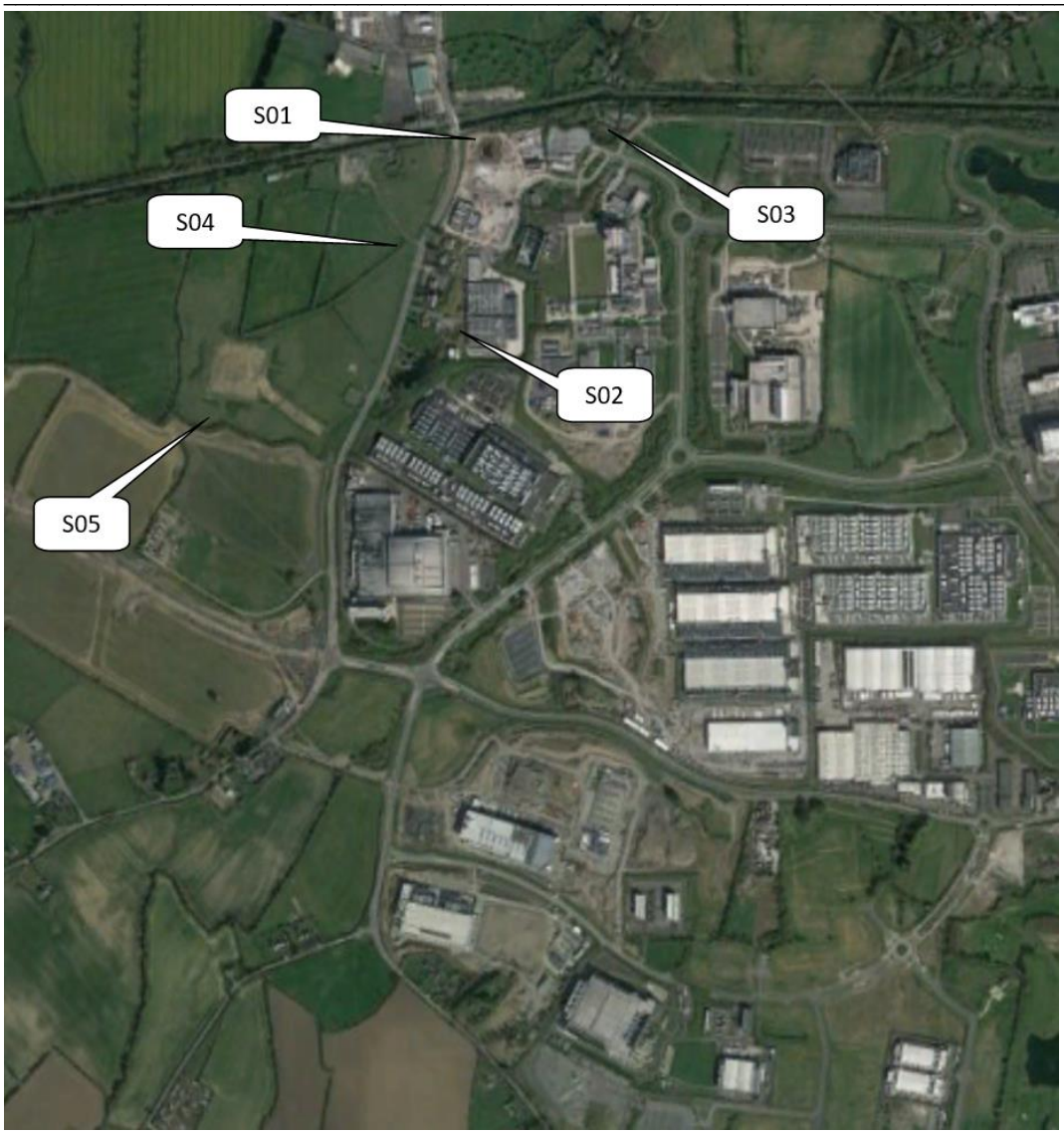

Figure A Noise monitoring locations (Background Imagery Source: Google Earth)

Survey periods
Measurements were conducted over the course of the following survey periods:

Table A Noise monitoring periods

Locations	Period	Start Time/Date	End Time/Date
S01, S02, S03	Day	09:50hrs 9 April 2016	12:40hrs 9 April 2016
	Evening	21:40hrs 9 April 2016	22:50hrs 9 April 2016
	Night	23:00hrs 9 April 2016	01:40hrs 10 April 2016
S04, S05	Unattended	15:00hrs 4 November 2020	11:45hrs 10 November 2020

Personnel & Instrumentation
AWN Consulting conducted the noise level measurements during the various survey periods. The measurements were performed using Brüel & Kjær Type 2260 Modular Precision Sound Analysers. Before and after the survey the measurement apparatus was check calibrated using a Brüel & Kjær Type 4231 Sound Level Calibrator.

Table B Instrumentation details

Meter	Serial Number
Brüel & Kjær 2260	2248262
Rion NL-42	575802
Rion NL-52	186670

Procedure

During each of the daytime, evening and night-time periods, measurements were conducted on a continuous basis over the stated time periods. Sample periods were 15 minutes during all surveys. The results were saved to the instrument memory for later analysis where appropriate. Survey personnel noted all primary noise sources contributing to noise build-up. In terms of the various locations the following significant noise sources (in subjective order of influence) were noted:

Table C Significant noise sources

Location	
S01	S02
• R120 road traffic noise. • Water running in a nearby canal in absence of traffic. • Site work and plant noise associated with existing sites. • During evening period noise dominated by traffic and water noise associated with the canal. • During night time plant noise from existing facilities (to the East and South) is the dominant background source.	• Plant noise from facility to the south. • Noise from existing site including impulsive noise (bangs) and reverse alarms. • Dogs barking and birdsong. • During the evening distant traffic noise and plant noise noted. • During night time existing plant noise from southern existing facilities is the dominant source. Distant traffic also noted.
Location	
S03	S04
• Noise dominated by existing plant noise from adjacent facility. • Occasional bus passing by. • Water flow from nearby watercourse. • Reverse alarms and construction noise from nearby site. • As above for evening period with the exception of construction noise. • During night time plant noise from the adjacent facility and water flow from nearby watercourse.	• R120 road traffic noise. • Water flow from nearby watercourse. • During night time plant noise from the adjacent facility and water flow from nearby watercourse noted.
Location	
S05	
• R120 road traffic noise. • Water flow from nearby watercourse. • During night time plant noise from the adjacent facility and water flow from nearby watercourse noted.	

Noise Monitoring Results

The noise data collated during the current noise survey is extensive in nature. It is not produced in full here however is available on request.

Table D presents average daytime and night time noise levels measured at the monitoring location over the period of the noise monitoring programme.

Table D Noise monitoring results

Location	Date	Period	Start Time	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)		
				$L_{Aeq,15min}$	L_{AFMax}	$L_{A90,15min}$
S01	9 April	Day	09:51	58	71	44
	9 April	Day	11:15	61	76	47
	9 April	Evening	21:46	53	63	45
	10 April	Night	00:01	48	61	42
	10 April	Night	00:58	49	67	43
S02	9 April	Day	10:23	48	65	42
	9 April	Day	11:37	48	73	41
	9 April	Day	12:47	49	65	43
	9 April	Evening	22:04	44	61	41
	9 April	Night	23:38	41	63	39
	10 April	Night	01:20	40	61	38
S03	9 April	Day	10:50	53	76	47
	9 April	Day	12:05	53	73	48
	9 April	Day	12:21	52	72	48
	9 April	Evening	22:35	51	68	49
	9 April	Night	23:00	51	70	48
	9 April	Night	23:16	49	54	48

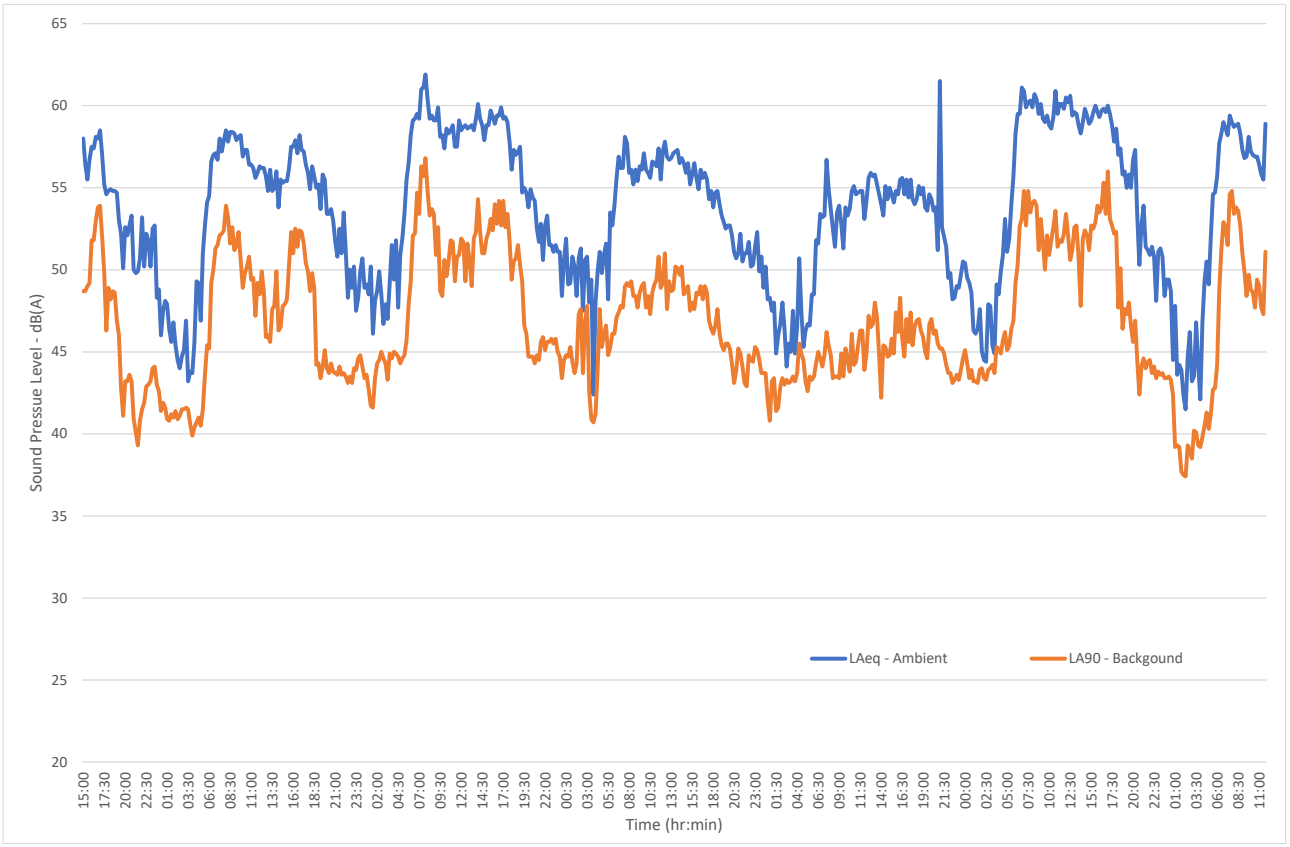

Figure B Unattended Noise Monitoring – Location S04

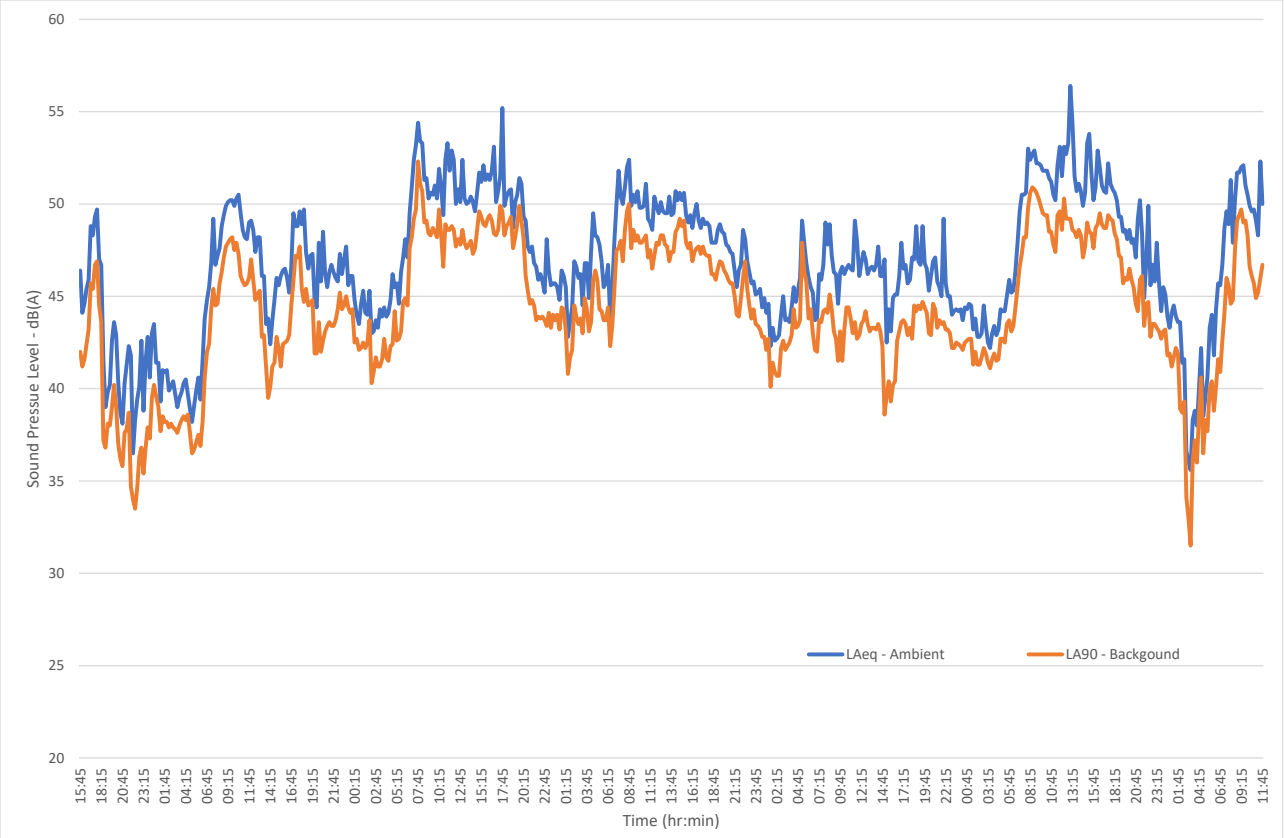

Figure C Unattended Noise Monitoring – Location S05

APPENDIX 9.3

INDICATIVE CONSTRUCTION NOISE & VIBRATION MANAGEMENT PLAN

PREPARED BY AWN CONSULTING LIMITED

This Noise and Vibration Management Plan (NVMP) details a 'Best Practice' approach to dealing with potential noise and vibration emissions during the construction phase of the development. The Plan should be adopted by all contractors and sub-contractors involved in construction activities on the site. The Site Manager should ensure that adequate instruction is provided to contractors regarding the noise and vibration control measures contained within this document.

The environmental impact assessment (EIA) Report conducted for the construction activity has highlighted that the construction noise and vibration levels can be controlled to within the adopted criteria. However, mitigation measures should be implemented, where necessary, in order to control impacts to nearby sensitive areas within acceptable levels.

Construction Noise Criteria

As referenced in the EIA Report prepared for the proposed development, appropriate criteria relating to permissible construction noise levels for a development of this scale may be found in the Transport Infrastructure Ireland (TII) publication *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*[2] which indicates the following criteria and hours of operation.

Table 9.3.1 Construction Noise Limit Values

Days and Times	Noise Levels (dB re. 2^{x10-5} Pa)	
	$L_{Aeq(1hr)}$	L_{Amax}
Monday to Friday 07:00hrs to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60*	65*
Saturdays 08:00hrs to 13:00hrs	65	75

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

Construction Vibration Criteria

It is recommended in this EIA Report that vibration from construction activities to off-site residences be limited to the values set out in Table 9.3.2. 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%.

Table 9.3.2 Construction Vibration Limit Values

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

Hours of Work

The proposed general construction hours are 07:00 to 18:00hrs, Monday to Friday and 08:00 to 14:00 on Saturdays. However, weekday evening works may also be required from time to time.

Weekday evening activities should be significantly reduced and generally only involve internal activities and concrete pouring which will be required during certain phases of the development. As a result, noise emissions from evening activities are expected to be significantly lower than for other general daytime activities.

Best Practice Guidelines for the Control of Noise & Vibration

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

BS5228 includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- selection of quiet plant;
- control of noise sources;
- screening;
- hours of work;
- liaison with the public, and;
- monitoring.

Detailed comment is offered on these items in the following paragraphs. Noise and vibration control measures that will be considered include the selection of suitable plant, enclosures and screens around noise sources, limiting the hours of work and monitoring.

Selection of Quiet Plant

This practice is recommended in relation to sites with static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures where possible. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.

General Comments on Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration should be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

BS5228 states that *"as far as reasonably practicable sources of significant noise should be enclosed"*. In applying this guidance, constraints such as mobility, ventilation, access and safety must be taken into account. Items suitable for enclosure include pumps and generators. Demountable enclosures will also be used to screen operatives using hand tools and will be moved around site as necessary.

In practice, a balance may need to be struck between the use of all available techniques and the resulting costs of doing so. As with Ireland's Environmental Protection Act legislation, we propose that the concept of *"best available techniques not entailing excessive cost "*(BATNEEC) be adopted. Furthermore, proposed noise control techniques should be evaluated in light of their potential effect on occupational safety etc.

BS5228 makes a number of recommendations in relation to "use and siting of equipment". These are all directly relevant and hence are reproduced in full. These recommendations will be adopted on site.

> *"Plant should always be used in accordance with manufacturers' instructions. Care should be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading should also be carried out away from such areas. Special care will be necessary when work has to be carried out at night.*
>
> *Circumstances can arise when night-time working is unavoidable. Bearing in mind the special constraints under which such work has to be carried out, steps should be taken to minimise disturbance to occupants of nearby premises.*
>
> *Machines such as cranes that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. Machines should not be left running unnecessarily, as this can be noisy and waste energy.*
>
> *Plant known to emit noise strongly in one direction should, when possible, be orientated so that the noise is directed away from noise-sensitive areas. Attendant operators of the plant can also benefit from this acoustical phenomenon by sheltering, when possible, in the area with reduced noise levels.*

Acoustic covers to engines should be kept closed when the engines are in use and idling. The use of compressors that have effective acoustic enclosures and are designed to operate when their access panels are closed is recommended.
Materials should be lowered whenever practicable and should not be dropped. The surfaces on to which the materials are being moved could be covered by resilient material."

All items of plant should be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

Screening

Typically, screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen and its position relative to both the source and receiver.

The length of the screen should in practice be at least five times the height, however, if shorter sections are necessary then the ends of the screen should be bent around the source. The height of any screen should be such that there is no direct line of sight between the source and the receiver.

BS5228 states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the barrier should be such that there are no gaps or openings at joints in the screen material. In most practical situations the effectiveness of the screen is limited by the sound transmission over the top of the barrier rather than the transmission through the barrier itself. In practice screens constructed of materials with a mass per unit of surface area greater than 7 kg/m^2 will give adequate sound insulation performance.

In addition, careful planning of the site layout should also be considered. The placement of site buildings such as offices and stores and in some instances, materials such as topsoil or aggregate can provide a degree of noise screening if placed between the source and the receiver.

Vibration

The vibration from construction activities will be limited to the values set out in Table 2. 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%.

Liaison with the Public

The Contractor will provide proactive community relations and will notify the public and sensitive premises before the commencement of any works forecast to generate appreciable levels of noise or vibration, explaining the nature and duration of the works. The Contractor will distribute information circulars informing people of the progress of works and any likely periods of significant noise and vibration.

A designated noise liaison should be appointed to site during construction works. Any complaints should be logged and followed up in a prompt fashion. In addition, prior to particularly noisy construction activity, e.g. rock breaking, piling, etc., the site contact should inform the nearest noise sensitive locations of the time and expected duration of the works.

Noise Monitoring

During the construction phase consideration should be given to noise monitoring at the nearest sensitive locations.

Noise monitoring should be conducted in accordance with the International Standard ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise* and be located a distance of greater than 3.5m away from any reflective surfaces, e.g. walls, in order to ensure a free-field measurement without any influence from reflected noise sources.

Vibration Monitoring

During the construction phase consideration should be given to vibration monitoring at the nearest sensitive locations.

Vibration monitoring should be conducted in accordance with BS7385-1 (1990) *Evaluation and measurement for vibration in buildings — Part 1: Guide for measurement of vibrations and evaluation of their effects on buildings* or BS6841 (1987) *Guide to measurement and evaluation of human exposure to whole-body mechanical vibration and repeated shock*.

The mounting of the transducer to the vibrating structure should comply with BS ISO 5348:1998 *Mechanical vibration and shock – Mechanical mounting of accelerometers*. In summary, the following ideal mounting conditions apply:

- the transducer and its mountings are as rigid as possible;
- the mounting surfaces should be as clean and flat as possible;
- simple symmetric mountings are best, and;
- the mass of the mounting should be small in comparison to that of the structure under test.

In general, the transducer will be fixed to the floor of a building or concrete base on the ground using expansion bolts. In instances where the vibration monitor will be placed outside of a building a flat and level concrete base with dimensions of approximately 1m x 1m x 0.1m will be required.

10.0 LANDSCAPE AND VISUAL

10.1 INTRODUCTION

The purpose of this assessment is 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 criteria as set out in the current EPA Guidelines on Information to be contained in Environmental Impact Assessment Reports (2022) are used in the assessment of the likely impacts.

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.

10.2 METHODOLOGY

The assessment was carried out by analysis of the proposals through, plans, aerial photographs, historic maps and by reference to the 'South County Dublin Development Plan 2022-2028' and the Landscape Character Assessment (Appendix 9, South County Dublin Development Plan 2022-2028). Through analysis of the above, the subject lands were assessed in relation to their surrounding environment to identify a study area in which both visual and landscape character impacts would be perceivable. Important landscape features on subject lands and in the wider area were identified as part of this process

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, 2022); and
- Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (Landscape Inst. + IEMA 2013).

The criteria as set out in the EPA Guidelines on Information to be contained in Environmental Impact Statements are used in the assessment of the likely impacts, these have been tabled below.

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

Table 10.1 Criteria for significance of effects under EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports, Published May 2022

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 of 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.

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

Sensitive receptors can include users of local public footpaths and cycletracks, users of local roads, residents in close proximity or with long-distance views of the subject lands, employers working close to the subject lands, users of local amenity space, etc.

10.3 RECEIVING ENVIRONMENT

The subject lands are located in Grange Castle Business Park. Due to the nature of the proposed development (as described in Chapter 2), the subject lands occupy a long, irregular shaped 5m wide, approximately 2.2km long corridor which spans from the southern to the north-western section of the business park. The Grand Canal towpath is located to the North of the subject lands, while to the East, there are a large number of industrial developments, which are both operational and under construction. Due to the nature of the Proposed Development, the site boundary is highly irregular in shape, therefore the landscape typology of the receiving environment varies along the route. The subject lands would be considered on a high-level to have an industrial landscape character, however, other landscape characters and typologies can be found on subject and local lands, most notably agricultural fields with traditional hedgerow boundaries and grass/meadow verged avenues associated with the Grange Castle Business Park.

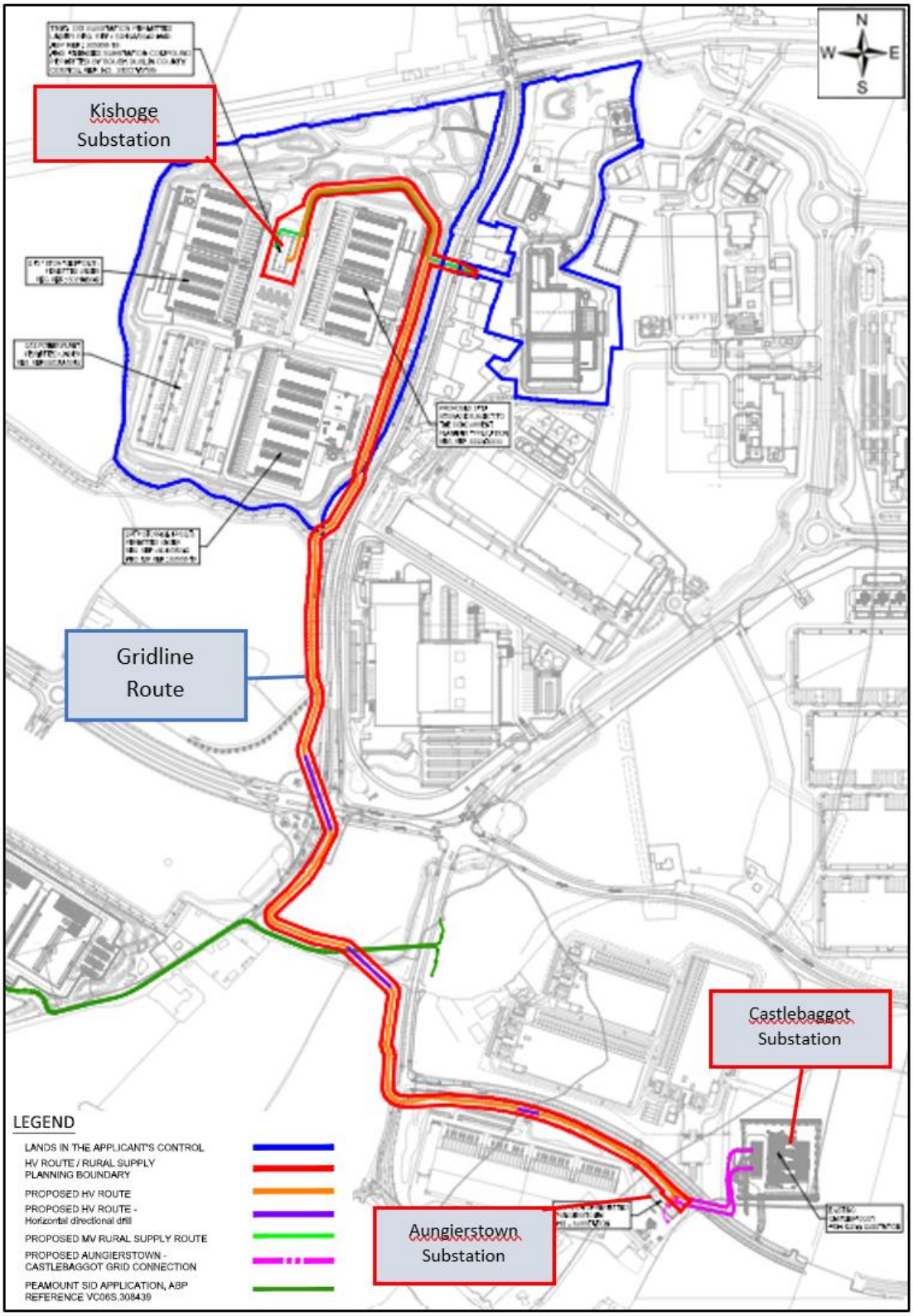

Figure 10.1 *Proposed Development Site (extract from CSEA Proposed Overall Route Plan ESSDUB98-CSE-01xx-DR-C-2100)*

General Landscape Setting

In the wider landscape the site is located in a generally flat area, between three landscape typologies. North of the subject lands, beyond the Grand Canal, development is dominated by residential areas such as Adamstown, Grange Manor and Lucan. The area to the South and East of the site 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, with many developments being under construction at present. Another 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. 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.

Trees and Vegetation

There has been no tree survey undertaken to accompany this application, however the extent and location of trees and vegetation have been reviewed through aerial photography. The extent of existing vegetation along the route is minimal. Much of the vegetation is associated with the agricultural fields in the local landscape and would be in the form of hedgerow boundaries and scrub vegetation, however there are also a small number of trees located along the route. Excluding this, the only other existing vegetation to be found is grass and meadow verges associated with the local infrastructure and the grassland associated with the surrounding agricultural fields.

10.3.1 Characteristics of the Proposed Development Site

The character of the site and its environs has largely been determined by the following:

- the number of large-scale industrial and commercial built developments in the local area.
- the extent of large-scale infrastructure in the local area
- the flat topography of the subject site and its surrounding environs
- landscape history of agricultural use with grassland and traditional hedgerow field boundaries.

Character, for the purposes of this assessment refers to the interaction of elements in the landscape that combine to give the area its particular identity. In this context, impacts on character include the effect on existing land uses and responses that are felt towards the combined effects of the new development.

The Proposed Development site has the character of an industrial park typified by wide roads and verges and ongoing construction of infrastructure and built-development.

The landscape character could also be categorised as transitional. There are still some areas within Grange Castle Business Park that have not been industrially developed and still currently have the landscape character of agricultural fields typified by traditional hedgerow boundaries, some of which are on the subject lands. The subject lands are also located in areas which are undergoing a significant amount of construction and are transitioning from agricultural fields to industrial built development.

The surrounding environment with its contrast of new built structures and historic field patterns would be considered a 'transitional landscape'.

The landscape of the subject lands has no inherent aesthetic qualities of note.

Existing Views and Visibility

The existing views of the subject lands are not considered to have any inherent visual quality or landscape value. The only visible elements of any relevance are existing roadside hedgerows, meadow verges and trees of the surrounding fields along the route of the proposed transmission line connections.

10.3.2 Landscape Planning

Within the Draft South County Dublin Development Plan 2022-2028 there is one 'Specific Local Objective' (Economic Development and Employment) that relates to the 12th lock and its environs which includes the north eastern section of the subject lands.

- *EDE4 SLO1: To investigate the full potential for the 12th Lock lands as centrally located within growing employment and residential areas, with tourism and active travel potential along the Grand Canal and have cognisance of the potential for the lands and associated heritage buildings to become a hub supporting the surrounding land uses while protecting the natural environment*.

Within the Draft South County Dublin Development Plan 2022-2028 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 most notably to the Grand Canal (Proposed Natural Heritage Area).

Green infrastructure objectives

- *Policy GI1: Overarching 'Protect, enhance and further develop a multifunctional GI network, using an ecosystem services approach, protecting, enhancing and further developing the identified interconnected network of parks, open spaces, natural features, protected areas, and rivers and streams that provide a shared space for amenity and recreation, biodiversity protection, water quality, flood management and adaptation to climate change.'*

- GI1 Objective 1 states: *'To establish a coherent, integrated and evolving GI Network across South Dublin County with parks, open spaces, hedgerows, trees including public street trees and native mini woodlands (Miyawaki-Style), grasslands, protected areas and rivers and streams and other green and blue assets forming strategic links and to integrate and incorporate the objectives of the GI Strategy throughout all relevant land use plans and development in the County.'*

- *Policy GI2: Biodiversity 'Strengthen the existing GI network and ensure all new developments contribute towards GI, in order to protect and enhance biodiversity across the County as part of South Dublin County Council's commitment to the*

National Biodiversity Action Plan 2021- 2025 and the South Dublin County Council Biodiversity Action Plan, 2020-2026, the National Planning Framework (NPF)and the East Region Spatial and Economic Strategy (RSES.'

- GI2 Objective 1 states: *'To reduce fragmentation and enhance South Dublin County's GI network by strengthening ecological links between urban areas, Natura 2000 sites, proposed Natural Heritage Areas, parks and open spaces and the wider regional network by connecting all new developments into the wider GI Network.'*

- GI2 Objective 2 states: *'To protect and enhance the biodiversity and ecological value of the existing GI network by protecting where feasible (and mitigating where removal is unavoidable) existing ecological features including tree stands, woodlands, hedgerows and watercourses in all new developments as an essential part of the design and construction process.*

- GI2 Objective 4 states: *'Integrate GI, and include areas to be managed for biodiversity, as an essential component of all new developments in accordance with the requirements set out in Chapter 13 Implementation and the policies and objectives of this chapter.*

- GI2 Objective 5 states: *'To protect and enhance the County's hedgerow network, in particular hedgerows that form townland, parish and barony boundaries recognising their historic and cultural importance in addition to their ecological importance and increase hedgerow coverage using locally native species including a commitment for no net loss of hedgerows on any development site and to take a proactive approach to protection and enforcement*.

- GI2 Objective 6 states: *'To continue to support and expand the County Pollinator Plan through the management and monitoring of the County's pollinator protection sites as part of the Council's commitment to the provisions of the National Pollinator Plan 2021-2025.*

- GI2 Objective 7 states: *'To enhance the biodiversity value of publicly owned hard infrastructure areas by incorporating the planting of new trees, grasses and other species, thereby integrating this infrastructure into the overall GI network*.

- *Policy GI14: Sustainable Urban Drainage Systems: 'Require the provision of Sustainable Urban Drainage Systems (SUDS) in the County and maximise the amenity and biodiversity value of these systems.'*

- GI4 Objective 1 states: '*To limit surface water run-off from new developments through the use of Sustainable Urban Drainage Systems (SuDS) using surface water and nature- based solutions and ensure that SuDS is integrated into all new development in the County and designed in accordance with South Dublin County Council's Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide.'*

- *Policy GI15: Climate Resilience: 'Strengthen the County's GI in both urban and rural areas to improve resilience against future shocks and disruptions arising from a changing climate'.*

- GI5 Objective 1 states: *Protect and enhance the rich biodiversity and ecosystems in accordance with the ecosystem services approach to development enabling mitigation of climate change impacts, by absorbing excess flood water, providing a buffer against extreme weather events, absorbing carbon emissions and filtering pollution.*

- GI5 Objective 3 states: '*To ensure compliance with the South Dublin Climate Change Action Plan and the provisions of the Council's Tree Management Strategy'.*

    - *Increase the County's tree canopy cover by promoting annual planting, maintenance preservation and enhancement of trees, woodlands and hedgerows within the County using locally native species and supporting their integration into new development.*
    - *Identify suitable sites for new urban trees including Miyawaki style mini woodlands, where feasible.*
    - *Support the implementation of a co-ordinated regional approach to the maintenance of trees and support the work of the Regional Steering Group on Tree Management to which South Dublin County Council is a participant.*
    - *Promote the establishment of tree trails in public parks across the County.*
    - *Promote the planting of new woodlands and forestry within appropriate open space and park locations within the County.*
    - *To plant "pocket forests" in tracts of open grassland to act as an oasis for biodiversity.*
    - *The Council recognises the value of mature trees in terms of carbon sequestration and amenity over saplings*.

- *Policy GI16: Human Health and Wellbeing: 'Improve the accessibility and recreational amenity of the County's GI in order to enhance human health and wellbeing while protecting the natural environment within which the recreation occurs.*

- GI6 Objective 5 states: '*To support the provision of new walkways and cycleways in suitable locations to improve the recreational amenity of GI corridors in a manner that does not compromise the ecological functions of the corridors.'*

- *Policy GI17: Landscape, Natural, Cultural and Built Heritage: 'Protect, conserve and enhance landscape, natural, cultural and built heritage features, and support the objectives and actions of the County Heritage Plan.*

- GI7 Objective 1 states: '*To protect, conserve and enhance natural, built and cultural heritage features and restrict development that would have a negative impact on these assets in accordance with the provisions of Chapter 3 Natural, Cultural and Built Heritage of this Development Plan.*'

- GI7 Objective 2 states: '*To protect and enhance the landscape character of the County by ensuring that development retains, protects and, where necessary, enhances the appearance and character of the landscape, in accordance with the provisions of South Dublin's Landscape Character Assessment and the provisions of Chapter 3 Natural, Cultural and Built Heritage of this Development Plan.*

GI Strategic Corridor 3: Grand Canal Corridor

- *To protect and enhance the Grand Canal as an ecological green corridor, recognising its role as a national/regional corridor for wildlife and some ecosystem services.*
- *Identify suitable sites for new urban trees including Miyawaki style mini woodlands, where feasible.*
- *To ensure that development along and adjacent to the Grand Canal, including the sensitive provision of amenity and recreational facilities, recognises the Canal's ecological status, avoiding areas and features of biodiversity and heritage sensitivity, and that appropriate set-back distances or buffer areas are identified and included.*
- *To engage with stakeholders along the Grand Canal to achieve shared objectives for this GI feature, without negatively impacting on the Canal's natural ecosystem services. To improve permeability and access to the Grand Canal for residents and visitors in a manner that does not cause habitat fragmentation*
- *To ensure that the design of recreational and amenity facilities along the Grand Canal Corridor will enhance and protect the character of the landscape through which it passes (see Appendix 9 South Dublin County Landscape Character Assessment, for landscape character details)..*

Natural Heritage Objectives

- *Policy NCBH4: Proposed Natural Heritage Areas*: *'Protect the ecological, visual, recreational, environmental and amenity value of the County's proposed Natural Heritage Areas and associated habitats and species.'*

- *NCBH4 Objective 1 states*: *'To ensure that any proposal for development within or adjacent to a proposed Natural Heritage Area (pNHA) is designed and sited to minimise its impact on the biodiversity, ecological, geological and landscape value of the pNHA particularly plant and animal species listed under the Wildlife Acts and the Habitats and Birds Directive including their habitats'*

- *NCBH4 Objective 2 states*: *'To restrict development within or adjacent to a proposed Natural Heritage Area to development that is directly related to the area's amenity potential subject to the protection and enhancement of natural heritage and visual amenities including biodiversity and landscapes. Such developments will be required to submit an Ecological Impact Assessment prepared by a suitably qualified professional.'*

- *Policy NCBH9: Grand Canal*: *'Protect and promote the Grand Canal as a key component of the County's Green Infrastructure and ecosystem services network, and protect and enhance the visual, recreational, environmental, ecological, industrial heritage and amenity value of the Grand Canal, recognising its sensitivities as a proposed Natural Heritage Area with adjacent wetlands and associated habitats.'*

- *NCBH9 Objective 1 states*: *'To ensure that any proposal for development within or adjacent to a proposed Natural Heritage Area (pNHA) is designed and sited to minimise its impact on the biodiversity, ecological, geological and landscape value of the pNHA particularly plant and animal species listed under the Wildlife Acts and the Habitats and Birds Directive including their habitats'*

- *NCBH9 Objective 2 states*: *'To facilitate the appropriate development of the Grand Canal as a recreational route for walking, cycling, nature study and water-based activities including fishing, canal boating, rowing, paddle boarding and canoeing/kayaking, subject to environmental safeguards and assessments'*

- *NCBH9 Objective 3 states*: *'To ensure that development along or adjacent to the Grand Canal contributes to the creation of an integrated network of appropriately designed walking and cycling routes connecting with the Grand Canal Way Green Route and which takes due cognisance of the sensitive nature of this national ecological corridor'*

- *NCBH9 Objective 4 states*: *'To ensure that development along and adjacent to the Grand Canal protects and incorporates natural heritage features including watercourses, wetlands, grasslands, woodlands, mature trees, hedgerows and ditches and includes an appropriate set-back distance or buffer area from the pNHA*

boundary to facilitate protected species and biodiversity and a fully functioning Green Infrastructure network'

- *NCBH9 Objective 5 states*: *'To ensure that development along or adjacent to the Grand Canal protects, incorporates and enhances built and industrial heritage features, particularly historic canal and mill buildings, and also sets out to protect the setting of such built heritage features*'

- *Policy NCBH11: Tree Preservation Orders and Other Tree Protections*: *'Review Tree Preservation Orders (TPO) within the County and maintain the conservation value of trees and groups of trees that are the subject of a Tree Preservation Order while also recognising the value of and protecting trees and hedgerows which are not subject to a TPO.'*

- *NCBH11 Objective 3 states*: *'To protect and retain existing trees, hedgerows, and woodlands which are of amenity and/or biodiversity and/or carbon sequestration value and/or contribute to landscape character and ensure that proper provision is made for their protection and management taking into account Living with Trees: South Dublin County Council's Tree Management Policy (2015-2020) or any superseding document and to ensure that where retention is not possible that a high value biodiversity provision is secured as part of the phasing of any development to protect the amenity of the area'*

- *NCBH11 Objective 4 states*: '*To protect the hedgerows of the County, acknowledging their role as wildlife habitats, biodiversity corridors, links within the County's green infrastructure network, their visual amenity and landscape character value and their significance as demarcations of historic field patterns and townland boundaries*'

There are no protected trees or tree groups within the subject lands listed in the South Dublin County Development Plan 2022-2028.

There are no views or prospects that include the subject lands listed in the South Dublin County Development Plan 2022-2028.

In the Landscape Character Assessment of South Dublin County (Appendix 6, South County Dublin Development Plan 2022-2028), the subject lands are designated as being in the 'Urban Fringe/ Peri urban Character Area'. This area is listed as being low/none in terms of landscape sensitivity.

10.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

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 110kV underground transmission line connections will originate from the Kishoge 110kV GIS substation. The substation was permitted as part of the development under Reg. Ref.: SD19A/0042 and ABP Ref.: 305948-19, as amended under Reg. Ref.: SD22A/0105. The proposed 110kV underground transmission line connections extend northwards from the Kishoge 110kV substation, before proceeding to the east and then to the south, along the periphery of the lands in the ownership of the applicant, and continuing alongside the R120 before continuing to the south and crossing the R134 New Nangor Road. The route then proceeds further southward and to the southeast to cross the R120, continues to the south and then to the east (adjacent to the Old Nangor Road), crossing the Griffeen River and proceeding eastwards and then south before crossing the Baldonnel Road and proceeding eastward within lands to the south of the Grange Castle South Business Park access road, before reaching and connecting to the Aungierstown – Castlebaggot underground transmission line. The Kishoge to Aungierstown transmission line circuit will include 4 no. joint bays, while the Kishoge to Castlebaggot transmission line circuit will include 5 no. joint bays. The proposed 110kV underground transmission line connections will cover a distance of c. 2.2 kilometers.

The development includes enabling works, services diversions, joint bays, connections to the Kishoge substation and the Aungierstgown – Castlebaggot transmission line, provision of a medium voltage electricity connection to serve the Kishoge substation from an existing ESB substation to the east of the R120, landscaping, services, all associated construction works, and all ancillary works.

10.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

10.5.1.1 Construction Phase

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 removal of vegetation.
- Visual impacts as a result of the introduction of trenching, stockpiling, temporary structures, access roads, machinery, materials storage, associated earthworks, car parking, lighting and hoarding.

Operational phase

The proposed works as described in the ‘Characteristics of the proposal’ has the potential to result in the following impacts:

- Visual impact due to the removal of trees and vegetation.

10.5.1.2 Likely Significant Impacts

Landscape assessments measure the sensitivity of specific landscape types and features and describe the nature and significance of changes to that landscape occurring because of a proposed development. In general, it can be assumed that landscape and visual impacts are intrinsically linked however both types of impacts are assessed separately in this study where a development characteristic may result in a starkly different type, quality or magnitude of impact in landscape or visual terms. The assessment of likely significant impacts has been made on the basis that all incorporated design mitigation measures are included.

Character, for the purposes of this assessment refers to the interaction of elements in the landscape that combine to give the area its identity. In this context, impacts on character include the effect on existing land uses and responses that are felt towards the combined effects of the new development.

10.5.2 Construction Phase

Removal of vegetation.

As described in Section 10.3, the extent of vegetation on the subject lands is minimal and is limited mostly to roadside hedgerows, scrub and grass and meadow verges. There are some trees along the route which may require removal to accommodate the cable route. The removal of any vegetation along the route of the Proposed Development is likely to be very localised and the amount very low, most of the vegetation would be in the form of field boundaries and scrub which would not be considered of any significant value in the landscape.

Service wayleaves exist throughout Grange Castle Business park to accommodate developments of this nature and have been located in order to avoid as much existing vegetation as possible. Furthermore, the Proposed Development involved careful planning of all new proposed cable routes to avoid as much existing vegetation as possible and there are few sections of the cable route where any vegetation will need removal.

The Proposed Development site is located within Grange Castle Business Park, where there have been many recent built developments which necessitated that vegetation removal of a similar scale and nature was required such as roads and infrastructure work, cabling work, substations, data centres and various other industrial scale developments. The impact of the removal of vegetation during construction would be negative, considered not significant in magnitude and long-term in its duration.

Change in use to a construction site.

The change of use of the site from its existing use to that of a construction site will result in an impact on the landscape character. 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. The initial construction operations associated with this will give rise to temporary impacts on the landscape character, through the introduction of new temporary structures, machinery, ancillary works etc., along with the removal of any existing vegetation, grassland or scrub.

The initial construction operations created by the clearance of certain parts of the site and the construction of the proposed structures will give rise to temporary impacts on

the landscape character, through the introduction of new structures, machinery, ancillary works etc.

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 within Grange Castle Business Park, where there have been many recent built developments which included construction activities of a similar scale and nature such as cabling work, substations, data centres and various other industrial scale developments. The impact of the change in landscape type during construction would be negative and considered slight in magnitude and temporary in its duration.

10.5.3 Operational Phase

Impact on Landscape Character

The operational phase will not give rise to any noticeable changes in the landscape character. The proposed cabling will run underground and will therefore cause no impact on landscape character. The impact of any removal of vegetation to accommodate the cable route would be considered negative but would however have no significant effect during the operational phase. The overall impact on the landscape character would therefore be considered neutral.

Visual impacts

There will be no visual impact other than that associated with the removal of vegetation. There are no visual impacts deriving from any of the built development, as there will be no overground structures associated with the development. The visual impact of the Proposed Development is therefore neutral.

10.5.3.1 *Impact on Landscape Planning*

The Green Infrastructure objectives that apply to the site and its environs, described under section 10.3.2 above, are mostly general objectives aimed at the protection of the existing green infrastructure network and strengthening ecological links in the wider landscape. The proposed development involved careful planning of all new proposed cable routes to avoid as much existing vegetation as possible and is in line with the planning objectives.

10.5.3.2 Summary of Likely Significant Impacts

Table 10.2 *Impacts During Construction accounting for Incorporated Design Mitigation only*

Impact	Quality	Significance	Extent	Probability	Duration
Removal of Vegetation	Negative	Not Significant	Local	Likely	Long Term
Change of Landscape Type	Negative	Slight	Local	Likely	Temporary

Table 10.3 *Impacts During Operation accounting for Incorporated Design Mitigation only*

Impact	Quality	Significance	Extent	Probability	Duration
Landscape Character	Neutral	-	Local	Likely	-
Visual Impact	Neutral	-	Local	Likely	-

10.6 REMEDIAL AND MITIGATION MEASURES

10.6.1 Incorporated Design Mitigation

- Reinstatement of any disturbed grassland, meadow, verges, roadside vegetation and green buffers which have been disturbed due to the proposed works; by seeding, replacing with grass turves and re-planting of young trees and hedgerow species.

10.6.2 Construction Phase Mitigation

- Implementation and monitoring of a well-managed and organised construction site, with control of construction activity, traffic, materials storage and lighting with due consideration for neighbouring residences.
- The proposed development is situated on suitably zoned lands in a landscape where a number of similar developments have been recently constructed or have recently acquired planning permission. As a result of this, the impacts associated with the construction period are common within the local landscape.

10.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

10.7.1.1 Summary of Residual Impacts

Table 10.4 *Impacts During Construction accounting for all mitigation measures*

Impact	Quality	Significance	Extent	Probability	Duration
Removal of Vegetation	Negative	Not Significant	Local	Likely	Long Term
Change of Landscape Type	Negative	Slight	Local	Likely	Temporary

Table 10.5 *Impacts During Operation accounting for all mitigation measures*

Impact	Quality	Significance	Extent	Probability	Duration
Landscape Character	Neutral	-	Local	Likely	-
Visual Impact	Neutral	-	Local	Likely	-

10.8 DO-NOTHING SCENARIO

There will be no change to the existing greenfield part and hardstand area of the development in the do-nothing scenario.

10.9 MONITORING OR REINSTATEMENT

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. No monitoring or reinstatement required during operations.

11.0 ARCHAEOLOGY, ARCHITECTURAL AND CULTURAL HERITAGE

11.1 INTRODUCTION

The following chapter assesses the predicted impacts of the Proposed Development on archaeological, architectural and cultural heritage. The proposed development traverses the townlands of Aungerstown and Ballybane, Ballymakaily, Clutterland and Milltown (see Figure 11.1).

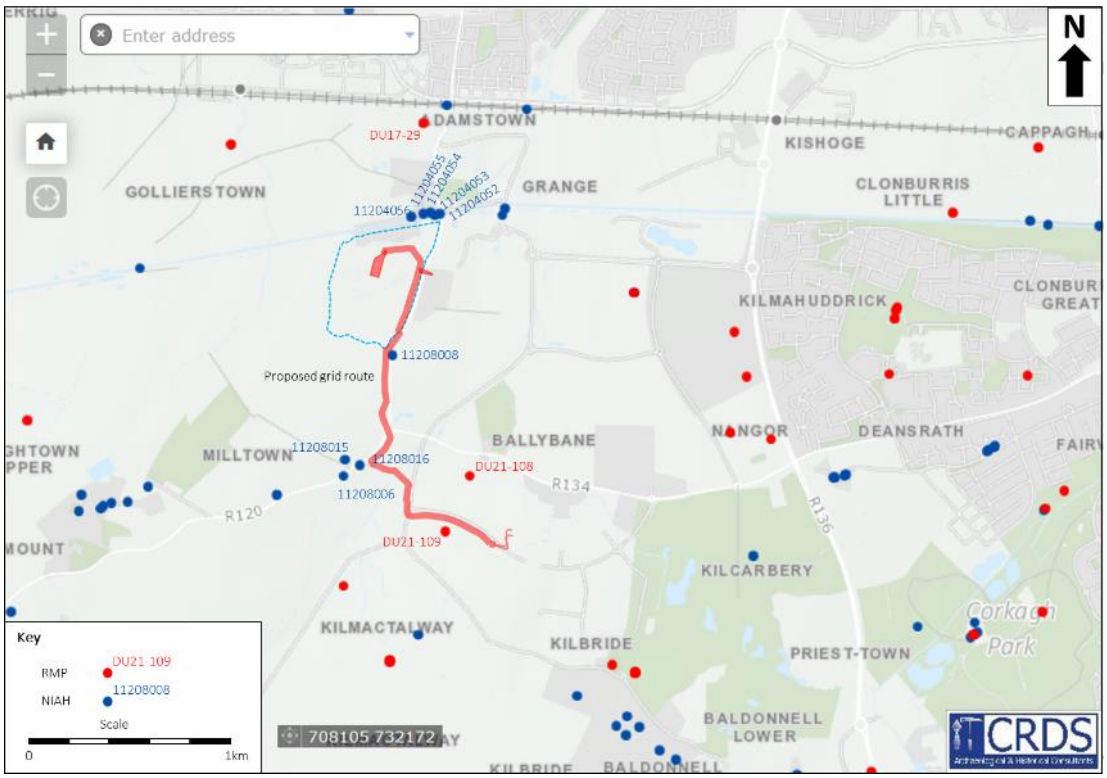

Figure 11.1 *Site location map showing recorded archaeological monuments and architectural heritage sites within the vicinity of the Proposed Development (source: www.archaeology.ie). Note NIAH 11208016 has been demolished*.

11.2 METHODOLOGY

11.2.1 Introduction

To set the proposed development within its wider archaeological, architectural and cultural heritage landscape, and to assess the potential of encountering such features on the site, a paper survey of archaeological, architectural heritage, historical and cartographic sources was undertaken. The following townlands were assessed Adamstown, Aungierstown & Ballybane, Ballybane, Ballymakaily, Clutterland, Finnstown, Gollierstown, Grange, Kilmactalway, Kilmahuddrick, Kishoge, Milltown and Nangor.

11.2.2 Record of Monuments and Places

The Record of Monuments and Places (RMP), comprising the results of the Archaeological Survey of Ireland, is a statutory list of all recorded archaeological

monuments known to the National Monuments Service. The relevant files for these sites contain details of documentary sources and aerial photographs, early maps, OS memoirs, the field notes of the Archaeological Survey of Ireland and other relevant publications. Sites recorded on the Record of Monuments and Places all receive statutory protection under the National Monuments Act 1994. The information contained within the RMP is derived from the earlier non-statutory Sites and Monuments Record (SMR); some entries, however, were not transferred to the statutory record as they refer to features that on inspection by the Archaeological Survey were found not to merit inclusion in that record or could not be located with sufficient accuracy to be included. Such sites however remain part of the SMR. The record is a dynamic one and is updated so as to take account of on-going research. The Record of Monuments and Places was consulted in the Archives of the Department of Arts, Heritage and the Gaeltacht .There are no recorded archaeological monuments located within the site boundary. There are three recorded archaeological monuments within the study area (see Figure 11.1 and Appendix 11.1).

11.2.3 Recorded Archaeological Objects

The National Museum of Ireland's topographical files are a national archive of all known archaeological finds from Ireland. They relate primarily to artefacts but also include references to monuments and contain a unique archive of records of previous excavations. The topographical files were consulted to determine if any archaeological artefacts had been recorded from the area. Other published catalogues of prehistoric material were also 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). A list of recorded finds is given in Appendix 11.2, though it is important to note that archaeological excavations in the area have also revealed numerous archaeological finds that have not yet been added to the NMI database (see Section 11.2.4 below).

11.2.4 Recorded Archaeological Excavations

The excavation bulletin website (www.excavations.ie) was consulted to identify previous excavations that have been carried out within the study area. This database contains summary accounts of excavations carried out in Ireland from 1970 to 2015. 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 11.3.

11.2.5 Cartographic Sources

1Reference 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 (see Figure 11.2), Rocque's map of 1760 and Taylor's map of Dublin 1816. Ordnance Survey maps consulted included 6" maps, first editions (see Figure 11.3) and the Ordnance Survey 25" maps (see Figure 11.4).

11.2.6 Architectural Heritage

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. No structures included in the NIAH or in the RPS are located within the footprint of the proposed development. All sites within the vicinity of the development were identified and are listed in Appendix 11.4 (see also Figure 11.1).

11.2.7 Aerial Photography

Available online sources for aerial photography were consulted, including the Ordnance Survey, Geological Survey and National Monuments Service collections (see Figure 11.5).

11.2.8 Historical Research

The baseline historical research utilised sources including Lewis' Topographical Dictionary of Ireland (1837), the Ordnance Survey Letters for County Roscommon and the Journal of the Roscommon Archaeological and Historical Society. See Appendix 11.5 for full list of references used.

11.3 RECEIVING ENVIRONMENT

The study area 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.

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 11.3). A stone axehead, made from porcellanite, also of Neolithic date, was found during the excavations at the site (License No. 19E0038; see below).

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; see DU017-080, Appendix 11.1). 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).

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. Limited evidence for potential pre-enclosure (prehistoric?) was recorded during archaeological excavation to the immediate west of the proposed site in Ballymakaily (License No. 19E0038; see Appendix 11.3), where a series of pits containing charcoal-rich soil and burnt stone were identified. These features may be indicative of cooking and/or other related activities.

The remains of a field system were 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 2002).

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).

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 11.3). 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. a large, circular enclosure, possibly defined by two, widely-spaced concentric ditches (Area 3).

Archaeological excavations following geophysical survey and testing undertaken in Ballymakaily (License No 19E0038; see Appendix 11.3) revealed an impressive array of features associated with multi-phase settlement and agricultural activity. The principal remains were identified in Area 3 and comprised two successive phases of enclosure. Potentially the earliest was a large, roughly circular enclosure seemingly

defined by two widely-spaced ditches, set c.15–20m apart. It had an overall (north–south) diameter of about 70m, with the inner boundary reaching a maximum diameter of c.30m. The area between the enclosing elements was traversed by a number of possible radial ditches that may delineate the footprint of several small fields or paddocks. This phase of enclosure appears to have been followed by the construction at the same location of a large, sub-circular ditched enclosure, with maximum overall dimensions of 50m north–south by 52m. It overlapped with the Phase 1 inner enclosure ditch on the south and east, and the Phase 1 outer enclosure ditch on the north and west, thereby erasing all trace of the earlier cuts and deposits. Both phases of enclosures produced evidence for internal occupation in the form of several possible circular structures/buildings, as well as pits, post-holes, spreads, etc., while their defining ditches were likely originally accompanied by internal earthen banks.

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.

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).

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.

The upstanding remains of Grange Castle (DU017-034----) are located c. 1km to the 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 11.2, Appendix 11.5). 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 11.3).

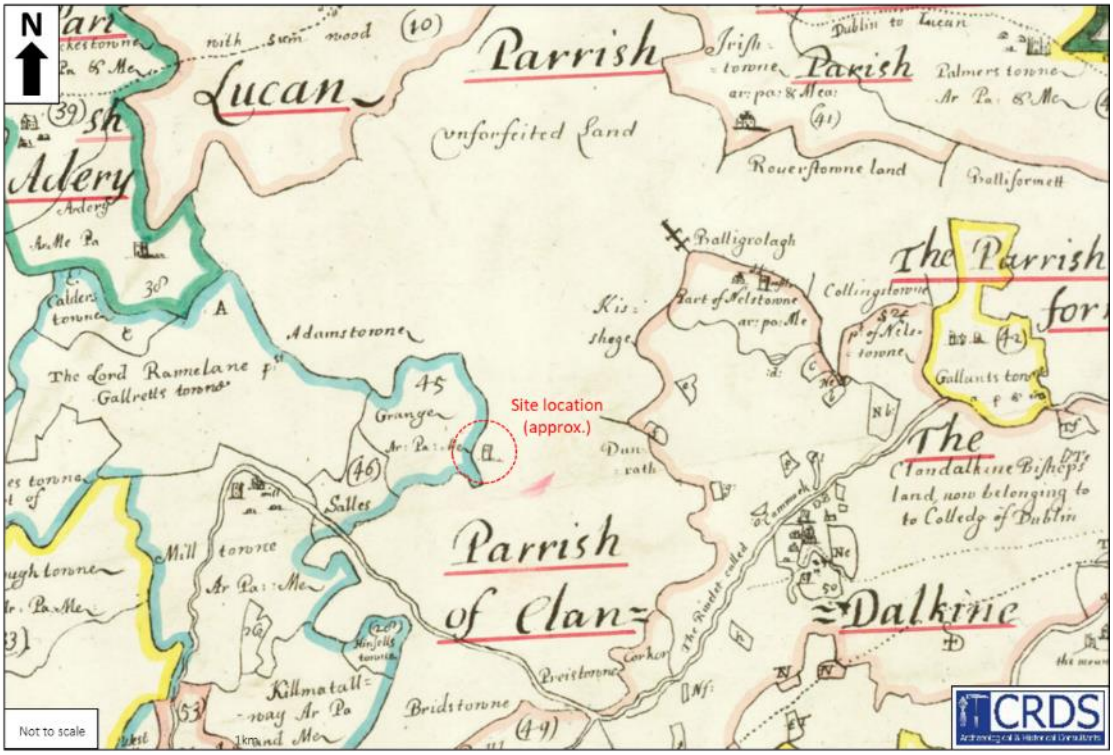

Figure 11.2. *Extract from Down Survey map (source www.downsurvey.tcd.ie).*

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 to the north of the proposed site.

The area is depicted as farmland on the 1st and 2nd edition Ordnance Survey Maps (see Figures 11.3 and 11.4). The townland boundary between Ballymakaily and Grange runs northeast to southwest, forming the eastern boundary of the northern half and bisecting the southern half of the area defined as the Property Boundary. It also forms the eastern boundary of the western portion of the area and separates this from the eastern linear portion of the area defined as Planning Boundary.

The area of the proposed development has been subjected to substantial development in the recent past, as evidenced by the Aerial Photograph (see Figure 11.5).

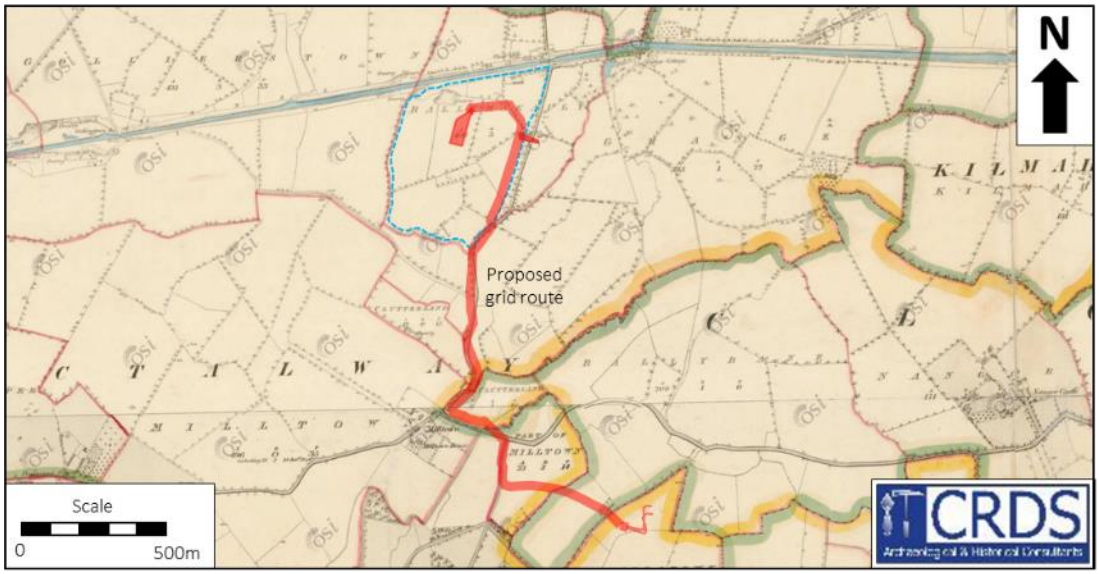

Figure 11.3. *Extract from 1st edition Ordnance Survey map (1830s; source www.archaeology.ie).*

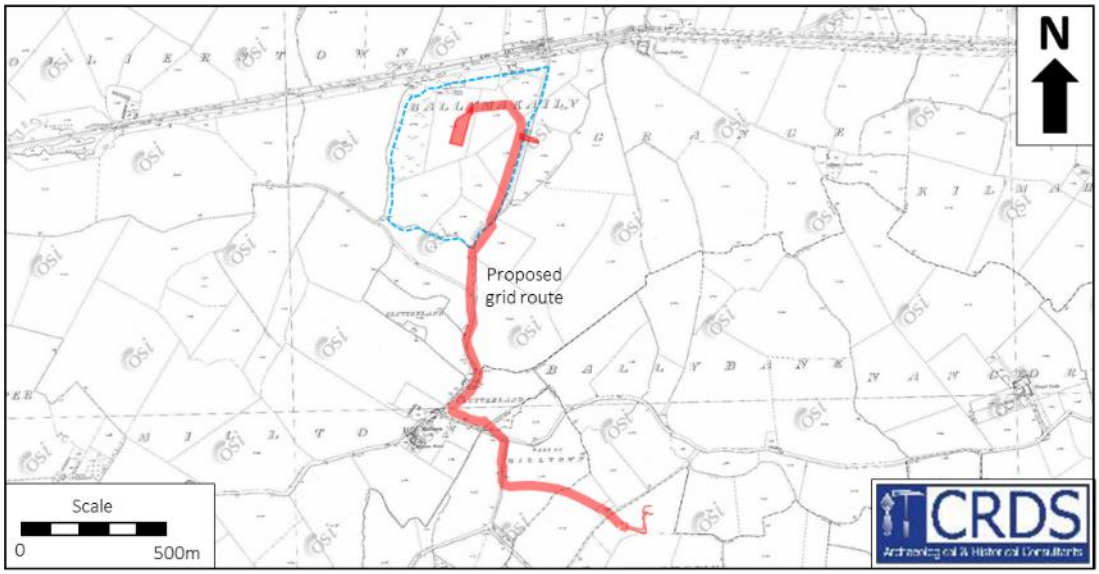

Figure 11.4. *Extract from 2nd edition Ordnance Survey map (1910s; source www.archaeology.ie).*

Figure 11.5. *Extract from aerial photograph of the site.*

11.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A description of the project is included in Chapter 2 Description of the Proposed Development. The characteristics in relation to archaeology is primarily shallow ground disturbance during construction. No impact post construction.

11.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

11.5.1 Construction Phase

The archaeological, architectural and cultural heritage impact at the site can be summarised as follows:

- There are no recorded archaeological sites or monuments within the proposed development lands, as listed in the Record of Monuments and Places for Co. Dublin.
- There are three recorded archaeological sites within the study area. None of these sites will be impacted, either directly or indirectly, by the proposed development works.
- There are no recorded archaeological finds from the site, though a stone axe found in the area suggests settlement in the Neolithic Period.
- Archaeological excavations in the area in advance of development works over the past two decades has also revealed a number of previously unrecorded archaeological sites. The results of the excavation of these sites further indicate prehistoric and medieval settlement and activity in the area.
- There are no architectural heritage structures within the site boundary. There are nine within the wider study area, recorded in the National Inventory of Architectural Heritage. None of these will be impacted on by the proposed development.
- The survey indicated that the majority of the site of the proposed development has been extensively and significantly impacted by previous development.
- However, the proposed development will traverse areas of previously undisturbed greenfield. In these areas, given the density of archaeological discoveries in the wider area, that previously unrecorded archaeological features survive. If such features exist, they could be impacted on by the proposed development.

The assessed impact is ***short term and imperceptible*** and **positive** (where any encountered archaeology is recorded).

11.5.2 Operational Phase

There are no potential impacts on archaeological, architectural and cultural heritage expected as a result of the operational phase of the Proposed Development.

11.6 REMEDIAL AND MITIGATION MEASURES

11.6.1 Construction Phase

Although no features of archaeological or architectural heritage were identified along the route of the proposed development, and the majority of the land required for the proposed development been extensively and significantly developed in the past, the route traverses a number of greenfield areas. In these areas, there is the potential for previously unrecorded archaeological features to survive. To mitigate against the potential impact of the proposed development on these features, should they exist, a programme of archaeological monitoring by a suitably qualified archaeologist under license to the National Monuments Service is recommended.

11.6.2 Operational Phase

No mitigation measures are required for archaeological, architectural and cultural heritage during the operational phase of the Proposed Development.

11.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

There will be no residual impacts of the proposed development on the archaeological, architectural and cultural heritage.

11.8 CUMULATIVE IMPACT

During operation there is no potential for cumulative impact as there will be no disturbance to ground.

During construction, there will be no impact on previously recorded archaeological remains, but there is a potential for previously unknown sub-surface archaeological features to be encountered during monitoring. Recent and ongoing development in the wider area as outlined in Table 2.1 and Chapter 3 has and will uncover previously unrecorded archaeology. The academic knowledge gained from the excavation of these features, and / or the excavation of features found during monitoring (should they be encountered) of this and other developments identified in Chapter 3), mean that the cumulative impact of this development with others will be ***longterm imperceptible and positive.***

11.9 MONITORING OR REINSTATEMENT

There are no requirements for ongoing monitoring or reinstatement requirements.

APPENDIX 11.1

RECORDED ARCHAEOLOGICAL MONUMENTS

PREPARED BY CRDS LTD.

Recorded Archaeological Monuments located within the vicinity of the proposed development are listed below (source Record of Monuments and Places for Co. Dublin, www.archaeology.ie).

RMP No.	**DU017-029----**
Townland	Adamstown (Newcastle By.)
Site Type	Castle - tower house
NGR	702836, 732705
Description	Located on flat ground between the canal and the railway. A three-storey tower house, which was oblong in plan with a projecting turret and stepped crenellations. Demolished in the 1960s. No visible at ground level (Compiled by: Geraldine Stout, Date of upload: 26 August 2011, Date of last visit: 23 July 1993.
Sources	RMP Healy, P. 1974 Report on Monuments and Sites of Archaeological Interest in County Dublin, p. 22 Ball, F. E. 1906 Parish of Arderrig Part 4, 58-60; Dix, E. R. 1897 The lesser castles of Co. Dublin, in Irish Builder, p. 12.

RMP No.	**DU021-108**

Townland	BALLYBANE
Site Type	Concentric enclosure
NGR	703060, 730985
Description	Not indicated on any OS map a large concentric enclosure is visible as a crop-mark on an aerial photo. A second enclosure (DU021-109----) is visible to the SW. The area of AH1 contains a recorded concentric enclosure (DU021-108). This site contains subsurface remains of a large double ditched enclosure and the morphology of this monument and its associated ditches suggest it is of possible early medieval date. However, 12th to 13th century pottery finds associated with the upper fills of both the internal and external ditch appear to suggest multiple periods of activity. Internal features and deposits within the enclosure are suggestive of settlement evidence. This monument has a diameter of approximately 60m (Stirland 2016, 10).
Sources	RMP Google Maps. Stirland, J. (ACS) 2016 Archaeological testing at Grange Castle South Business Park Ballybane, Clondalkin, Dublin 22 (16E0531).

RMP No.	**DU021-109**
	
Townland	BALLYBANE
Site Type	Enclosure
NGR	702937, 730716
Description	Not indicated on any OS map this enclosure is as a crop-mark on an aerial photo. A second larger enclosure (DU021-108----) is visible to the NE. AH5 – the archaeological test trenching confirmed the presence of a single-ditched circular enclosure (DU021-109), 44m in diameter with the ditch measuring 3m wide and 1.6m deep. The general appearance of this features is suggestive of a possible ringfort type enclosure. No internal features were recorded (Stirland 2016, 10).
Sources	RMP Google Maps. Stirland, J. (ACS) 2016 Archaeological testing at Grange Castle South Business Park Ballybane, Clondalkin, Dublin 22 (16E0531).

APPENDIX 11.2

ARCHAEOLOGICAL FINDS

PREPARED BY CRDS LTD.

The recorded archaeological finds in the vicinity of the proposed development, are listed below, all noted in the National Museum of Ireland files, Kildare Street, Dublin 2, or in other published catalogues of prehistoric material: 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. The following townlands were assessed Adamstown, Aungierstown & Ballybane, Ballybane, Ballymakaily, Clutterland, Finnstown, Gollierstown, Grange, Kilmactalway, Kilmahuddrick, Kishoge, Milltown and Nangor.

Registration No.	**NMI 1994:20 IA/28/1994**
Townland	Kishoge
Object Type	Bronze Flat Axe
Description	Possible Derryniggin type bronze flat axe. Bronze disease covering both surfaces. Found with metal detector.

In addition to the above, a large number of archaeological artefacts have been recorded from excavations in the study area (see Appendix 11.3).

Finally, in the course of archaeological testing and excavations at the Ballymakaily site in 2019 (License No. 19E0038), 115 archaeological finds were discovered. These predominantly comprised pottery, stone, iron and glass dating to the medieval period, but also included a stone axehead of Neolithic date.

APPENDIX 11.3

EXCAVATIONS

PREPARED BY CRDS LTD.

The excavation bulletin website (www.excavations.ie) was consulted to identify previous excavations that have been carried out within the study area. This database contains summary accounts of excavations carried out in Ireland from 1970 to 2020. The following townlands were assessed Adamstown, Aungierstown & Ballybane, Ballybane, Ballymakaily, Clutterland, Finnstown, Gollierstown, Grange, Kilmactalway, Kilmahuddrick, Kishoge, Milltown and Nangor.

Excavation No.: 1996:068
Location: Nangor Castle, Clondalkin
Site Type: Medieval
NGR: O045312
Licence No.: 96E273
Trial-trenching in the vicinity of the now-demolished castle and eighteenth-century house produced evidence for a substantial ditch and an associated shallower linear feature. Neither feature produced any datable artefacts but had silted up with a series of organic-rich clays with animal bone, shell and matted grass-possibly bedding material.
Trial-trenching continued in the field bounding the castle site to its south, after an extensive geophysical survey had been carried out. Results from these cuttings suggest widespread archaeology surviving below the ploughsoil. Several lignite cores and slivers, early medieval pottery and metal slag were all retrieved both from the trenches and from field-walking, suggesting a date in at least the early medieval period- twelfth/thirteenth century. Several trenches cut through a large ditch located on both the east and west of the field, which apparently substantiated the impression, given from the overall lie of the land, that the field had contained a ploughed-our rath or ring-ditch. Human skeletal remains were also uncovered, as were numerous charcoal-flecked irregular features. Other than some cutting into the ditch, the trench went no deeper once in situ archaeology was reached.
Cia McConway, Archaeological Development Services Ltd. Power House, Pigeon House Harbour, Dublin 4.

Excavation No.: 1997:086
Location: Nangor Castle/Grange Castle, Kilmahuddrick, Clondalkin
Site Type: Medieval?
NGR: O045312
SMR No.: 17:34 and 17:37
Licence No.: 97E0116
Test-trenching was carried out along the line of a proposed road leading northwards from the vicinity of the now-demolished Nangor Castle to Grange Castle, within the area of a proposed industrial park. This was the second phase of testing, the first phase having concentrated on the field to the immediate south of Nangor Castle and its general vicinity.
An intensive geophysical survey had been carried out along the line of the proposed road and several anomalies were identified. This testing specifically examined the areas of anomalies, as agreed on with the relevant authorities within the National Monuments Service. Trenching was carried out by machine, and halted once in situ archaeological deposits were encountered. However, as experienced before, only subsoil-cut features survived-years of ploughing the fairly shallow ploughsoil had completely removed any potential archaeological stratigraphy.
Seven trenches were opened. Of these, only three, all located in Grange Field 3, to the east of Grange Castle, produced any significant archaeology. Two linear features 0.5-0.8m wide, of unknown date and function, ran in a north-south direction. However, their proximity both to the 15th-century castle and to one another could suggest substantial archaeological potential. Some spreads of brown soil had 20th-century pottery inclusions in their upper surface, while other areas, a mix of brown soil and broken slate subsoil, were probably the result of the dragging action of the plough.
This licence was taken over by Richard O'Brien to carry out monitoring and excavation along the line of the road (No. 87 below).
Cia Mc Conway, Archaeological Development Services Ltd, Windsor House, 11 Fairview Strand, Fairview, Dublin 3.

Excavation No.: 1997:087
Location: Grange Castle Business Park, Kilmahuddrick, Clondalkin
Site Type: Medieval
NGR: O045312
SMR No.: 17:34 and 17:37
Licence No.: 97E0116ext.

Monitoring and excavation were undertaken in advance of the construction of an access road and the excavation of foul sewers for a Business Park at Grange Castle. The excavation work continued until February 1998. Documentary evidence is scarce for Nangor Castle, but it is known that a castle stood on the site in the 16th century. Grange Castle is an upstanding 15th-century tower-house. It is proposed to develop an industrial park in this area.

Previous archaeological assessment by Cia Mc Conway (Excavations 1996, 17, 96E273, and above, No. 86) and geophysical survey by A. Mc Cleary, ADS Ltd, in February 1997 established that the area was archaeologically sensitive.

In advance of construction of a site access road topsoil was stripped from a 24m-wide area by mechanical excavator, under archaeological supervision, for a distance of 480m northwards from the Nangor Road. A further strip, 6m wide and 1300m long, was excavated for the sewers. The full 24m-wide strip was excavated in the field adjacent to Grange Castle.

All archaeological features uncovered had been truncated by deep ploughing, resulting in the removal of all but subsurface features cut into natural boulder clay.

A curving ditch was identified in Field 1; it terminated at Nangor Road, and was orientated north-east/south-west. It was 30m in length, 0.8-0.9m deep, and 1.2-2.4m wide. The eastern terminus continued beyond the limits of the excavation. The upper fills contained charcoal, mortar, flint and animal bones, and were aceramic. A decorated bone comb, stick-pin and knife gave the later ditch phase a terminus ante quem of from the 12th to the 13th century AD.

A stone causeway, 0.5-0.6m wide and 0.06-0.1m deep, crossed the ditch. The existence of this ditch had been shown in Mc Conway's assessment.

Field 7 is located between Grange Castle and the Kilmahuddrick Housing Estate. Two curving ditches were identified in this field. One was found under a post-medieval stone and brick trackway. It was 51m in length and varied in width from 1.1m to 1.4m, and in depth from 0.3m to 0.4m. A stone causeway, 0.6-0.84m wide, crossed it towards the western side of Field 7. No datable finds came from the primary fills of the ditch, but the secondary fills consisted of charcoal-rich clays with animal bones. It continued beyond the limits of the excavation at its western end.

A second ditch was found 1.6m east of the eastern terminus of the first. No archaeological features or deposits were found in this gap. The second ditch closely resembled the first; it was 22m long, 2m wide and 0.5-0.6m deep. The primary fills were sterile apart from some animal bone. The secondary fills consisted of charcoal-rich clays in which were found animal bones, mortar, two metal knives, and a fragment of worked lignite. An incomplete one-sided decorated bone comb and fragments of another in the upper fills gave a terminus ante quem of the 12th to 13th century AD. This ditch continued beyond the limits of excavation at its eastern end. The evidence from Field 7 suggests that extensive early medieval and post-medieval activity survives in this area; the ditches can be interpreted as medieval field boundaries.

A pit that contained a deposit of iron slag was found in Field 2, north of the site of Nangor Castle; it was associated with post-holes and stake-holes, though no structural pattern could be discerned.

Elsewhere various pits, hearths, furrows and field drains were recorded; some of the hearths may be prehistoric in date.

Richard N. O'Brien, Archaeological Development Services Ltd, Windsor House, 11 Fairview Strand, Fairview, Dublin 3.

Excavation No.: 1998:129
Location: Kilcarberry Distribution Park, Nangor, Clondalkin
Site Type: Monitoring
Licence No.: 98E0572

The development is for the provision of infrastructural works to serve an industrial distribution park. Monitoring was requested as a condition to any planning permission. Reference to the SMR reveals the presence of a number of recorded monuments within the general landscape, although there are no known sites within the proposed development area.

Monitoring, ongoing at time of writing, has failed to note any archaeological features on the site, with the exception of one 1m-wide north-south modern field drain. Finds have been restricted to the north-west corner of the site but include only sherds of post-medieval pottery along with several sherds of modern pottery, all recovered from the topsoil.
Removal of topsoil has revealed limestone bedrock across the site, with occasionally a natural layer of friable, mid-grey, fine, silty clay with moderate stone inclusions sealing the bedrock layer and sealed by topsoil.
Dermot Nelis, Irish Archaeological Consultancy Ltd, 8 Dungar Terrace, Dun Laoghaire, Co. Dublin.

Excavation No.: 1999:170
Location: Kilcarberry Distribution Park, Nangor, Clondalkin
Site Type: Adjacent to monuments
SMR No.: 17:37 (vicinity of)
Licence No.: 98E0572
Archaeological monitoring at this site was ongoing when the summaries published in Excavations 1998 (42) were written. A further three days' monitoring was required in January 1999 to bring this project to completion.
The development is for the provision of roads, sewers, water mains and other ancillary infrastructural works to serve an Industrial Distribution Park. Because of the presence of recorded archaeological remains within the general landscape, Dúchas The Heritage Service recommended that archaeological monitoring be requested as a condition to any planning permission. Reference to the Sites and Monuments Record reveals the presence of a number of monuments within the general landscape, although there are no known archaeological sites within the proposed development area. A 15th-century tower-house (SMR 17:34), recorded on the Down Survey of c. 1655, is 600m north of the development site. Nangor Castle (SMR 17:37), a castle incorporated into a 19th-century mansion, is 500m east of the development area. All buildings on the site have now been demolished, however, leaving no surface trace of the earlier building. The site of Kilbride Castle (SMR 21:4) is 600m south of the proposed development, although again no visible surface remains are present. An unplastered wall is extant, but it does not contain any cut stone, although it was probably constructed using material from the castle. Slightly to the south-east of this are a church and graveyard (SMR 21:00501), a ringfort (21:00502) and earthworks (21:00503). The church is in ruins and stands in a circular raised graveyard at the edge of a broad-bottomed valley. It is possible that this is the site of an early ecclesiastical enclosure.
Monitoring has failed to reveal any archaeological features on the site, with the exception of one 1m-wide north-south modern field drain. Finds have been restricted to the north-west corner of the site, but these include only several small sherds of post-medieval pottery, along with several sherds of modern pottery, all recovered from the topsoil.
Removal of topsoil has revealed naturally deposited limestone bedrock across the site, with occasionally a c. 0.5m-thick natural layer of friable, mid-grey, fine, silty clay with moderate stone inclusions, 30-70mm, evenly distributed, sealing the bedrock layer and sealed by topsoil.
Dermot Nelis, IAC Ltd, 8 Dungar Terrace, Dun Laoghaire, Co. Dublin.

Excavation No.: 2000:0223
Location: Grange/Kilmahuddrick/Nangor (Grange Castle International Business Park), Clondalkin
Site Type: Various
NGR: O043318
Licence No.: 00E0263
The Grange Castle International Business Park is located to the west of Clondalkin village and incorporates part of the townlands of Grange, Kilmahuddrick, and Nangor. Wyeth Medica Ireland intends to construct a biotechnology campus on this site. The area, of c. 100 acres (40ha), was used for agricultural purposes until recently. The site is bounded to the north by the Grand Canal, to the south by the New Nangor Road, to the east by a new housing estate and land reservation for the proposed Dublin Outer Ring Road (linking the N4 and N7 roads), and to the west by the Grange Castle International Business Park access road.
Two medieval occupation sites are adjacent to the boundary of the Business Park. Grange Castle (SMR 17:34) is a fine late medieval tower-house, while Nangor Castle (SMR 17:37), to the south of the development site, appears to have been demolished during the 1970s.

Geophysical survey and excavation were previously carried out by Cia McConway and Richard N. O'Brien (Excavations 1996, 17, 96E0273; Excavations 1997, 26–7, 97E0116). This work revealed that plough-truncated medieval and prehistoric features do survive within the confines of the Business Park.

Archaeological assessment by the writer consisted of the excavation of test-trenches during April and May 2000 in Fields 105, 106, 109, 110 (EIS field reference numbers) and in the northern part of Field 111. This was followed by the test-trenching of anomalies detected through geophysical survey carried out by Geophysical Surveys Bradford (GSB) in Fields 104, 107, 108, 111 (southern part), 112, 113 and 114. This assessment took place during June and July 2000.

A ring-barrow was detected through geophysical survey and follow-up test-trenching in Kilmahuddrick townland (Field 108). The remains of field boundaries were revealed close to this ring-barrow. Approximately 50m to the east of the ring-barrow two cobbled surfaces, a charcoal spread and a series of linear features were revealed (see below No. 225).

Other truncated archaeological features were detected in Field 110 to the south of the Grange Castle tower-house. In the other areas that were tested a number of features were detected, the majority of which can be explained by ploughing or by the presence of spreads of dumped redbrick debris. Much of this redbrick debris appears to have been over-fired and reduced to a vitreous slag. There was no evidence for in situ burning or oxidation of the natural subsoil adjacent to these features. These redbrick features were only detected in Field 112.

To the south of Kilmahuddrick townland, in Nangor townland, several features of archaeological potential were detected. In Field 111 a small, undated, charcoal-rich pit was revealed. This contained a small quantity of cremated bone. In the central part of Field 111 a cluster of small, undated pits and charcoal stains was detected. A trench in the south-eastern corner of the field revealed a large cut into natural, containing 19th/20th-century cultural material. This cut corresponds with the location of an 'Old Gravel Pit' marked on the 1864 1:2500 OS map.

Field 112 is located to the north of Nangor Castle and is adjacent to the Business Park access road. In the south-eastern corner of this field a cluster of cobbled surfaces, pits and gullies, associated with medieval pottery, was revealed. Some 60m to the west of this complex a narrow ditch on a south-east/north-west axis was detected. No cultural material that could date this feature was retrieved (see below No. 226).

Further medieval material was uncovered in Field 113. Here, a trench contained a series of linear ditches directly associated with medieval ceramics (see below No. 226). A short stretch of ditch was also revealed in the north of Field 113. This length of ditch was undated but contained frequent inclusions of charcoal at the base. The ditch proved difficult to trace, but the location and orientation correspond with an anomaly detected in the geophysical survey carried out by GSB. Trenches excavated in the south-eastern portion of this field revealed a series of concrete yard surfaces and modern buildings associated with recent occupation of Nangor Castle. These remains had been covered over by spoil derived from nearby construction activity in the recent past.

Test-trenching in Field 114, a narrow field immediately north of Nangor Castle, revealed modern ground disturbance to a depth of 1.4m below the ground level. This field appears to have been associated with the Nangor Castle gardens.

None of the areas of archaeological potential have any visible, above-ground, expression. Archaeological features, where detected, were present in a truncated form, cut into subsoil and were only apparent when ploughsoil was removed.

Excavation of the ring-barrow and adjacent features commenced under licence 00E0448, while the medieval remains in Nangor townland were excavated under licence 00E0754. Topsoil-stripping during construction was monitored under licence 00E0718.

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Excavation No.: **2000:0224**
Location: Grange/Kilmahuddrick/Nangor (Grange Castle International Business Park), Clondalkin
Site Type: Monitoring
NGR: O043318
Licence No.: 00E0718

Monitoring of topsoil-stripping commenced in early September 2000. In Nangor townland, in the northern part of Field 111, the remains of a small fulacht fiadh were revealed. This consisted

of a small pit or trough, a spread of heat-cracked stone and a linear feature to the south-west of the trough.
The pit/trough consisted of a subcircular cut into natural, 0.56m by 1.25m. The cut was steep-sided, leading to a flat base. It was filled with a mix of silt and compact, stony clays.
A spread of heat-shattered sandstone was located some 0.9m to the west of the trough. This spread consisted of a moderately compact, dark grey, sandy clay with frequent inclusions of heat-shattered sandstone fragments, pieces of burnt clay and charcoal. This spread measured 1.92m north–south x 1.18m with a maximum depth of 0.05m.
Approximately 6m to the west of the spread a linear gully feature was revealed. This gully consisted of a cut into natural boulder clay measuring 2.57m north–south x 0.28–0.54m. This had a depth of 0.16m with sharply sloping sides and a flat base. The cut was filled with a moderately compact, mid-brown clay containing frequent pieces of oxidised clay and occasional flecks of charcoal. Infrequent fragments of burnt bone were noted in the fill. Some 4m to the south of the heat-shattered sandstone spread, a small linear gully feature was excavated. This measured c. 1m north-east/south-west x 0.12m with a depth of 0.14m. The fill of this comprised a mid-brown, sandy clay with frequent charcoal flecking. No archaeological objects were recovered.
To the south of the fulacht fiadh, a backfilled field boundary was revealed by topsoil-stripping. The alignment of this boundary possibly corresponds with a similar ditch encountered in Field 113 (see above No. 223).
Topsoil-stripping is set to continue in 2001.
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Excavation No.: **2000:0225**
Location: Kilmahuddrick (Grange Castle International Business Park), Clondalkin
Site Type: Ring barrow
NGR: 304420 231665
Licence No.: 00E0448
The initial detection of this ring-barrow by geophysical survey was confirmed by archaeological assessment under licence 00E0263 (See above No. 223). Excavation commenced in July for a period of eight weeks, during which time the ring-barrow and several adjacent features were excavated.
The ring-barrow was located in Field 108, a large field at the centre of the area designated for the biotechnology campus buildings. The topography is generally level at c. 68m OD. However, the south-eastern corner of the field contains a natural raised area measuring c. 60m east–west x 150m. This area is generally 2m higher than the surrounding topography. The ring-barrow was sited in this slightly elevated position.
The ring-barrow was not visible prior to the geophysical survey or archaeological testing. Following stripping, a dark, circular band of charcoal-rich, black, ditch fill was visible, with a spread of cremated bone in the interior. A series of linear features skirted the eastern side of the ditch. Excavation of the ditch fills revealed a well-stratified sequence of deposits in a ditch 2.5m wide at the top and 0.25–0.3m wide at the base. The ditch cut had a depth of 1.6m below the level of natural subsoil and measured c. 13m in external diameter.
The uppermost fills of the ditch, F4 and F5, contained occasional fragments of burnt bone, charcoal and mollusc shells. Although occasional fragments of burnt bone were recovered from these ditch fills, no coherent or discrete cremation deposits were detected. Fragments of a human skull were recovered from the upper fill. A central fill of mid-brown, silty clay in the ditch sealed a series of stone features. F15 and F16, in the western quadrant, were large limestone blocks resting in the base of the ditch. Charcoal deposits were present on the flat upper surfaces of these stones. Oxidised clay patches against the sides of the ditch, adjacent to these stones, indicate that fires had been lit on these boulders in the ditch.
In the northern quadrant of the ditch, at the base, a stone ‘cist-like’ structure with a capstone was revealed. This was composed of medium-to-large angular stones leaning inwards at an angle of c. 45o. A large, angular capstone was positioned at the apex of the inward-leaning stones. Several of the stones comprising this small structure were fire-reddened, though there were no indications of in situ burning. When excavated, this structure was empty. Some 2m to the east of this structure, at the base of the ditch, a limestone pillar was revealed. This stood upright to a height of 0.62m and had a width of 0.44m.

Within the circular area enclosed by the barrow ditch, several deposits of cremated bone were visible. A small spread of cremated bone was initially apparent, and this may indicate disturbance. Upon excavation this was found to seal a shallow depression filled with frequent inclusions of powdered cremated bone fragments. To the north-west of this, a pit measuring some 2.1m north–south x 0.6m was revealed. This pit contained occasional fragments of cremated bone and appeared to cut an irregularly shaped cremation pit (F87), which measured 1.3m east–west x 0.5m and had a depth of 0.8–0.9m. The upper fill of this was a hard, compact, grey clay with occasional stones. This fill sealed a layer of cremated bone and charcoal. A sherd of pottery was recovered from this material, the characteristics of which all point to an Early Bronze Age date for its manufacture, specifically a Beaker or Food Vessel background (Anna Brindley, pers. comm.). What appears to be a small black bead was retrieved, during sieving, from this deposit.

Two undated pits were excavated adjacent to the barrow. A series of linear features was also revealed in the area surrounding the ring-barrow. These are interpreted as the remains of field boundaries and were found to enclose the ring-barrow in a subrectangular field system. These remain undated. A geological seam was traced running from the north side of the barrow.

Some 50m to the east of the ring-barrow a trench was reopened in Field 109 to examine features originally detected during assessment 00E0263 (see above No. 223). A northern return of the field system found to enclose the ring-barrow was revealed. This places the ring-barrow in a rectangular enclosure measuring c. 50m east–west x 100m (minimum). A metalled surface was found to seal the field boundary in this trench. While the field boundary system remains undated at the time of writing, it is likely to post-date the ring-barrow. A hearth was also excavated.

Analysis of the soil samples from the ring-barrow has recovered evidence of cereal production. Charred remains of barley, wheat and oats were identified in the ditch fills and cremation deposits. Traces of hazel, haw and sloe were also found. Post-excavation analysis of the human remains, the faunal remains and the charcoal samples is ongoing.

A cluster of ring-barrows is located on the upland area of Saggart Hill and Verschoyles Hill, approximately 6km to the south of the Kilmahuddrick site. Within this group, the Lugg monument complex, which contained a ring-barrow, was excavated by Kilbride-Jones in the late 1930s. The Kilmahuddrick barrow may be a northern element of this distributional cluster, or, alternatively, its presence in a heavily ploughed lowland area may indicate a greater survival rate and higher level of visibility in the upland areas.

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Excavation No.: 2000:0226
Location: Nangor (Grange Castle International Business Park), Clondalkin
Site Type: Medieval field complex
NGR: 30440 23117
Licence No.: 00E0754

Excavations commenced in this area of the Grange Castle International Business Park in October 2000 and are continuing at the time of writing (January 2001). The site of Nangor Castle (SMR 17:37) is located immediately outside the southern boundary of the Wyeth Medica Ireland biotechnology campus. There are no upstanding remains of Nangor Castle—demolition appears to have happened in the 1970s. Cartographic evidence and test-trenching carried out close to this area (see above No. 223) indicate that a complex of agricultural buildings and concrete surfaces existed in the area. To the west of the Nangor Castle site, mid-19th-century OS maps depict a well-designed garden. The unkempt remains of this garden exist today to the south of the biotechnology campus.

The place name Nangor appears to be of old French origin. In 1307 there is a reference to the tenements of ‘Kilbryde and the Naungre’, which were held by Walter de Kenley from William, son of John de Galbarry, for a rent of 20 pounds (Mills 1914, 356). Test-trenching carried out by Cia McConway in 1996 at Nangor Castle revealed at least one substantial ditch and a shallow linear feature to the west of the castle site (Excavations 1996, 17, 96E0273).

The present phase of excavation was designed to resolve any archaeological material in Fields 112 and 113 within the southern boundary of the biotechnology campus. In addition to this, excavation is ongoing to the south of the boundary in a corridor through the Nangor Castle gardens (South Dublin County Council land) to enable a gas pipeline and access road to serve the Wyeth Medica Ireland site.

To date, a complex of intercutting medieval ditches and gullies has been excavated. Some 1500 sherds of locally manufactured medieval pottery (Dublin-type wares, Leinster cooking ware) have been recovered. A complete iron sickle was found in a ditch associated with sherds of medieval pottery. Further details will be provided for Excavations 2001.

Reference

Mills, J. (ed.) 1914 Calendar of the Justiciary Rolls or Proceedings in the Court of the Justiciar of Ireland, Edward I. Part 2. Dublin.

Ian W. Doyle, Margaret Gowen & Co. Ltd, 2 Killiney View, Albert Road Lower, Glenageary, Co. Dublin.

Excavation No.: 2001:427

Location: Grange Castle International Business Park, Grange and Kishoge
Site Type: Various
NGR: 204230 232120
Licence No.: 00E0061

Test-trenching was carried out at Grange Castle International Business Park, Clondalkin, Dublin 22, on a site owned by South Dublin County Council, during February 2001. The greater part of this site is currently under development as a business park by Wyeth Medica Ireland.

The assessment was concerned with the area immediately south of the Grand Canal in Grange and Kishoge townlands. It is intended to construct an attenuation lake in this area, which will aid drainage. The lake structure will measure approximately 250m north-west/south-east by 90m. An underground 110kV electricity cable will run through this area and towards the west for a length of approximately 1.5km. The terrain in the areas to be affected is relatively low-lying and the land has been used for agricultural purposes. The centre of the area intended for the attenuation lake was subjected to ground disturbance in the recent past. This disturbance appears to have been associated with the diversion of a stream and ground was stripped to bedrock in places.

Sixteen trenches were opened by mechanical excavator. These were placed in the areas which would be subjected to disturbance by the attenuation lake and the electricity cable way-leave.

Trench 1 was located at the western end of the lake and associated roadway. It revealed a long linear feature cutting natural subsoil. Where sectioned, the cut for this feature, which measured 2.6m east–west by 16.5m with a depth of 0.35m, comprised a sloping-sided flat-bottomed gulley. The upper fill consisted of a moderately compact light brown clay silt with occasional inclusions of mollusc shells and small pebbles. The lower fill comprised a moderately compact grey clay with occasional mollusc shell inclusions. A small undated hearth was revealed in Trench 4, which was also located to the west of the lake.

Trench 13 was opened on the line of the electricity cable way-leave, at a point where a mound and masonry wall were observed in the extreme north-eastern corner of the field. What is likely to be a modern agricultural feature was revealed, comprised of a mound, a stone wall and a metalled surface. This is likely to represent a watering-hole for livestock formed by excavating a depression, placing the upcast to the west into a mound, which was then revetted with a low masonry wall. A metalled surface was then placed at the point of animal access.

Monitoring of topsoil-stripping was recommended and was later carried out (see below, No. 428).

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Excavation No.: 2001:428

Location: Grange Castle International Business Park, Grange/Nangor/ Kilmahuddrick
Site Type: Monitoring
NGR: 304420 231665
Licence No.: 01E0718

Monitoring continued in the townlands of Grange, Nangor and Kilmahuddrick. Wyeth Medica Ireland commenced construction of a biotechnology campus in this area in September 2000.

The campus area is located west of Clondalkin village and incorporates parts of the townlands of Grange, Kishoge, Kilmahuddrick and Nangor. It is bounded to the north by the Grand Canal, to the south by New Nangor Road, to the east by a new housing estate and reservation for the South Dublin Outer Ring Road and, finally, to the west by the Grange Castle International Business Park access road. The Wyeth Medica Ireland site is approximately 90 acres in extent.

Previously, during 2000, excavation in Kilmahuddrick townland concentrated on a prehistoric ring-barrow, which was resolved in advance of construction (Excavations 2000, No. 225, 00E0448). Monitoring of topsoil-stripping in October 2000 led to the identification and excavation of a small fulacht fiadh in Nangor townland. The monitoring of topsoil-stripping within these townlands continued during January 2001. No additional archaeological material was detected.
Ian W. Doyle for Margaret Gowen & Co. Ltd, 2 Killiney View, Albert Road Lower, Glenageary, Co. Dublin.

Excavation No.: 2001:429
Location: Grange Castle International Business Park, Grange and Kishoge
Site Type: Post-medieval
NGR: 20423 23212
Licence No.: 01E0718 ext.
The archaeological assessment carried out in this area during February 2001 (see below, No. 438) recommended that an archaeologist be present to monitor the stripping of topsoil.
The initial recognition of archaeological features was compromised somewhat by the contractor stripping a quantity of topsoil before informing the archaeologist. However, several metalled surfaces, field drains, pits and gullies of post-medieval and modern date were recognised during the stripping when an archaeological presence was maintained.
In Kishoge townland, to the south-west of the area intended for the attenuation lake, the remains of a subrectangular structure, which appears to have burnt down, were detected. This consisted of what appeared to be the remains of slot-trenches cut into natural boulder clay with a fill of oxidised clay and charcoal. The feature measured 5.8m east–west by 4.6m and appeared to have been truncated through intensive ploughing. Access to this area was not available at the time of the assessment owing to dumping and storage of building materials. This area was later excavated by Edmond O'Donovan (see below, No. 438).
Ian W. Doyle for Margaret Gowen & Co. Ltd, 2 Killiney View, Albert Road Lower, Glenageary, Co. Dublin.

Excavation No.: 2001:438
Location: Kishoge
Site Type: Prehistoric house
NGR: 30423 23212
Licence No.: 01E0061
The remains of a truncated burnt Neolithic wooden house were identified in Kishoge, Dublin 22, halfway between Clondalkin and Newcastle. Ploughing in antiquity had led to the truncation of the structure, and no occupation surfaces survived. However, cut features, such as post-holes, pits and foundation trenches, were identified at the site.
The house was originally roughly rectangular in shape, although the walls were slightly curved at the south-western end. The structure measured 6.05m (north-east/south-west) by 4.5m. The archaeological remains consisted of foundation trenches cut into the glacial boulder clay and bedrock. The house walls and the support for the building's superstructure were constructed from timber posts augmented by planking. All of the posts and planks identified in the house were of oak. The foundation trenches varied between 0.25m and 0.3m in width and were excavated to a depth of 0.08–0.21m. The foundation trenches at the north-eastern end of the house originally housed upright timber planks that formed the house walls. A break in one of these linear features (house wall) was visible in the north-eastern foundation trench; this was interpreted as an entrance. The south-western end of the house was predominantly post-built. The south-western house walls curved, with an open entrance at the southern end of the building.
Only two features were identified in the interior of the structure: the truncated remains of two internal timber roof supports, suggesting some kind of internal division within the house into two spaces at the north-east and south-west ends. The house appeared to have burnt down in antiquity, with little evidence for repair or reoccupation.
Pits and charcoal were identified both to the south and north-west of the house. These features are likely to represent contemporary domestic activity around the dwelling. A small number of artefacts were retrieved from these features, including a number of crude round scrapers, waste flint and a single poorly preserved fragment of prehistoric pottery.

Rough flint scraping tools and flint waste flakes were retrieved from the features excavated on the site, but none of these were obviously diagnostic. The complete absence of prehistoric pottery from the house is curious. The morphological comparison with other Neolithic houses excavated in Ireland suggests that the structure dates from this period. This was confirmed by the results of the radiocarbon dating programme. The Centrum voor Isotopen Onderzoek, Groningen, processed three samples to date the house (GrN-26770, 4880+40 BP; GrN-26771, 5020+40 BP; and GrN-26789, 4990+50 BP). The 2-sigma-calibrated results indicate that the house was built and occupied between 3941 and 3659 BC. A fourth Middle Bronze Age date (GrN-26772, 3120+75 BP) was obtained from a large pit to the south of the house (1595–1131 BC), suggesting that not all of the peripheral archaeological activity is contemporary with the structure.
Edmond O'Donovan, Margaret Gowen & Co. Ltd, 2 Killiney View, Albert Road Lower, Glenageary, Co. Dublin.

Excavation No.: 2001:455
Location: Grange Castle International Business Park, Nangor
Site Type: Medieval field system
NGR: 304400 231170
Licence No.: 01E0754
Excavations were carried out in Nangor townland, west of Clondalkin, Dublin 22, during October 2000–January 2001. The excavations revealed a medieval ditch complex. The northern area of the site is presently under development as a biotechnology campus.
Construction of the campus commenced in September 2000. The area excavated in Nangor is south of the construction site and outside the immediate area of impact. No detailed development is presently intended for the greater part of this area. However, additional excavation was undertaken to mitigate the impact of a gas pipeline and associated access road in part of the area formerly occupied by the Nangor Castle gardens. Nangor Castle (RMP 17:37) is located immediately outside the southern boundary of the Wyeth Medica Ireland site. References to a castle at this site date from the 15th–16th centuries. All buildings on the site were demolished during the 1970s, but an area of archaeological potential surrounds the site.
Trench 1, which measured 60m north–south by 33m, was located some 90m to the north-west of the castle site. Geophysical survey and subsequent test-trenching had suggested that the area of Trench 1 held archaeological potential. Excavation in Trench 1 commenced in October 2000 and continued until December 2000. Activity assigned to Phase I in this trench consisted of a linear feature and a pit, both of which cut natural subsoil. These features did not produce pottery or finds. The pit consisted of a rectangular cut into natural subsoil, which contained a series of ash deposits. Areas of oxidised or fire-reddened soil present on the north-east and south-west sides are indicative of in situ burning. This cut was filled with a series of sterile silty layers and dumps of ash.
The Phase I activity was succeeded by a medieval phase of activity which consisted of further linear features, pits and cobbled surfaces. These were assigned to a single general phase which is capable of further subdivision based on stratigraphic grounds. Finds retrieved from the fills of these features include approximately 1000 sherds of Leinster Cooking Ware and Dublin-type wares, and assorted iron finds including nails, an armour-piercing arrowhead, a buckle, a key and an intact iron sickle.
Trench 2, located to the east, detected a similar sequence of linear features, which contained sherds of medieval pottery in their fills. Trench 3, to the south of Trench 1, detected shallow linear features running on an east–west axis. These linear features were succeeded by a pit and a metalled surface, both of which were directly associated with medieval pottery.
Trench 4, located to the west, was excavated to examine a ditch encountered during an earlier assessment. A ditch orientated north-west/south-east with steep sloping sides and a rounded U-shaped base was revealed. It was 1.05m wide, narrowing to 0.3m at the base, with a maximum depth of 1.1m. Its fill contained occasional fragments of animal bone, from which a radiocarbon date of cal. AD 601–883 was obtained.
Trench 5, located to the south-east of Trench 4, uncovered further medieval linear features. A narrow ditch which ran across the trench on a south-east/north-west axis is likely to represent a continuation of a similar feature encountered in Trench A to the south. A series of post-medieval field boundaries was also detected in Trench 5.
Trench A was excavated to the south of Trench 5 on the line of the gas pipeline and associated roadway. Excavation in this area revealed an undated metalled surface and a series of

ditches/gullies. Excavation of these commenced in January 2001. Although there were relatively few finds from these features, their stratigraphic relationship indicates that there were five phases of ditches and gullies in the trench dating from medieval to modern times.
The excavation of Trench B, an extension of Trench A, revealed one feature of interest, a substantial medieval ditch which cut into natural subsoil. This was found in the extreme eastern end of the trench. The ditch ran through Trench B, outside the northern and southern limits of excavation. The cut measured 10m north–south by 2.5m, with a depth of 1.1m as exposed, and had sloping sides and a rounded base. The ditch ran on a north–south axis with a slight curve towards the north-east. In overall plan the ditch appears to have been subcircular, enclosing an area to the east of Trench B. The fills of the ditch comprised black sticky silts with organic content. The lower and upper fills contained medieval pottery. No trace of an enclosing bank was detected in the area opened for examination; however, the depth of overburden, composed of cultivated soils, in this area may be in part composed of a levelled bank.
Trench C to the north-east of Trench B did not detect the ditch. No archaeological material was detected in Trench C, where it was found that modern disturbance had removed the old ground surface.
In total, some 1600 sherds of native medieval pottery were recovered from the Nangor excavations. It is of some interest that only two sherds of imported medieval pottery were recovered. The excavated linear features at Nangor may represent the remains of medieval field boundaries with associated water-management gullies. The presence of such linear features, which can be dated to the medieval period by the presence of Leinster Cooking Ware and Dublin-type wares, argues for land enclosure during the medieval period. That cereal production was the purpose of such enclosures may be suggested by evidence from pollen and macro-plant analysis. The examination of a wide range of medieval samples from the Nangor excavations has shown a predominance of wheat over other plant remains.
Ian W. Doyle for Margaret Gowen & Co. Ltd, 2 Killiney View, Albert Road Lower, Glenageary, Co. Dublin.

Excavation No.: **2002:0448**
Location: Adamstown
Site Type: No archaeological significance
NGR: E 702819m, N 732976m
Licence No.: 01E1147
Test excavation before the construction of a housing development was carried out in the townland of Adamstown, adjacent to the Newcastle Road, west Dublin. The greenfield site measured c. 200m by 200m. Testing was required because of the proximity of the site to that of Adamstown Castle, SMR 17:29. Seven trenches, 30–50m long, were excavated by mechanical digger. In no trench were finds, features or structures of archaeological significance uncovered.
Georgina Scally, 81 Upper Leeson Street, Dublin 4, for Margaret Gowen & Co. Ltd.

Excavation No.: **2002:0612**
Location: Kishoge
Site Type: Monitoring
NGR: O042325
Licence No.: 02E1808
Monitoring before the construction of a temporary haul road associated with the construction of the South Dublin Outer Ring Road was undertaken in November and December 2002. The temporary haul road is in the vicinity of Lynches Lane, in the townland of Kishoge, west Dublin. All subsurface works associated with the construction of the road were monitored, and no finds, features or structures of archaeological significance were uncovered. The licence has since been extended to include monitoring of the full length of the roadway, which will extend c. 5.7km from Kingwood in Tallaght to Lynche's Lane. This work will continue in 2003.
Georgina Scally, 81 Upper Leeson Street, Dublin 4, for Margaret Gowen & Co. Ltd.

Excavation No.: 2003:0604
Location: Grange
Site Type: Mill
Licence No.: 03E1210
The site was excavated because it was directly threatened by the realignment of the Griffeen River within the precincts of the Grange Industrial Park. Surface evidence for the mill was in the form of the north wall, surviving as part of the boundary fence separating the Beattie farm from the Grand Canal towpath. Some 19th-century pottery was found on the surface and some fragments of floor tiles from an industrial drying kiln. Testing and subsequent excavation revealed the extent of the building as a single block, 13m west–east by 8.5m. Wall thickness was between 0.8 and 0.9m. The wall structure was of coursed rubble with opes defined by brick dressings. The dressings allowed for the identification of two window opes in the north-east corner of the building. Flanking the main block to the west was a wheel pit, 2.2m in width and 1.6–1.7m in depth. The wheel pit is delimited on the west by a wall 0.85m thick, widening to 1.1m where the axle bearing was mounted. The wheel pit was partially lined with red brick. The upper courses, forming the downslope of the wheel pit, are formed of brick with headers presented, while the lower part of the pit and its base are lined with brick, stretchers presented. The flanking walls show evidence for wheel wear in the stonework, and this suggests that the wheel had a diameter in the region of 3m. The wheel was breast shot fed from a headrace to the south. The headrace either emanated from a penstock to the south or was linked back to the Griffeen further upstream. There was no evidence for a race in the field south of the mill site. The confluence of the headrace and the wheel pit is again lined with red brick in a rough English bond pattern.
Within the mill structure, the pit for the pit wheel was identified. No machinery was present on the site. Artefacts within the mill structure were largely of 19th-century date, although some sherds of post-medieval imported ware were found in the topsoil but do not appear to be contemporary with the mill. It is possible that the mill has its origin in the later 18th century and served as a gristmill for flour milling. The general water supply would make such a mill difficult to operate. With the inauguration of the Grand Canal, a constant head of water became available and so the mill relocated to the Lock area at Adamstown. It is likely that the machinery was taken from the old mill and tweaked to function within the new mill. The old mill may well have served a later function as a cereal-drying kiln, as suggested by the quantities of kiln tiles found on the northern part of the site.
Red Tobin, Margaret Gowen & Co. Ltd, 2 Killiney View, Albert Road Lower, Glenageary, Co. Dublin.

Excavation No.: 2003:0607
Location: Grange Castle
Site Type: Monitoring
NGR: 030335 23200
SMR No.: 17:29; 17:34; 17:37
Licence No.: 03E0025
Monitoring of topsoil-stripping for a pharmaceutical plant and associated services located at Grange Castle International Business Park was carried out from 8 January to 2 February 2003. The development consisted of a 20-acre greenfield site, of which c. twelve acres were stripped of topsoil by a mechanical excavator equipped with a toothless bucket. The only subsoil cut features uncovered dated to recent times. These consisted of refuse pits, field drains and areas of burning. The field boundary and watercourse that were revealed had been backfilled in the 19th century. All the finds recovered were either post-medieval or modern in date.
John O'Connor, 2 Walnut Rise, Courtlands, Dublin 9, for Archaeological Development Services Ltd.

Excavation No.: 2003:1918
Location: Grange International Business Park, Dublin
Site Type: No archaeological significance
SMR No.: DU017-034
Licence No.: 03E1846
Monitoring of works took place within the constraint area of Grange Castle, RMP 17:34, at Grange International Business Park, Clondalkin. South Dublin County Council required tat the site be cleared of debris and secured with a fence and ground-beams. The site was being

vandalised and used as a dumping ground. A method statement was agreed with the client and with the National Monuments Service. This involved a low-impact solution involving lightweight plant, with the majority of the work being carried out in dry weather to further reduce the surface damage.
The clearance work was carried out without disturbing any archaeological deposits and without the recovery of any artefacts. The fencing required the excavation of a series of holes for the fence posts. These excavations were monitored and no archaeological deposits were disturbed. The ground slab required some excavation but was secured within the depth of the topsoil and remaining debris field. The work has now been completed satisfactorily.
Red Tobin for Margaret Gowen & Co. Ltd, 2 Killiney View, Albert Road Lower, Glenageary, Co. Dublin.

Excavation No.: 2004:0602
Location: Grange International Business Park, Grange
Site Type: Burnt mounds
Licence No.: 04E0299
Excavations were carried out during works on the Griffeen River realignment, part of ongoing infrastructure works within the precincts of the Grange International Business Park. The works are principally aesthetic in purpose, designed to enhance the appearance of the park and to highlight the river, which otherwise would have flowed behind the Takeda Pharmaceuticals complex. The area stripped will also accommodate the extended road network that will serve the business park when it is fully occupied.
Topsoil-stripping for this realignment commenced in early December 2003 and continued intermittently until May 2004. Topsoil-stripping revealed the locations of three burnt mounds. Of these three features, two were excavated, as the development was likely to have a total impact on them. The third mound was preserved in situ, as it was located outside the development area.
The first mound was excavated between 16 and 18 February 2004 and the second was excavated from 5 April 2004.

Burnt Mound 1, 303279.542 231522.602
During the monitoring of the topsoil removal this site was identified as an irregularly shaped deposit of firing material (heat-shattered stone and blackened soil). The burnt-mound material extended 28m east-west along the northern edge of the stripped corridor and extended to the south by 8m from the northern baulk. The feature lay c. 25m to the west of the Griffeen River on gently undulating pasture sloping to the south. The evidence from initial survey work and subsequent excavation suggests that the main spread of this site remains preserved in situ to the south of this location.
The nature and extent of the mound material was exaggerated by plough action, which had dragged it from its original focal point to extend over 28m in length. After the removal of topsoil, etc., the F2 mound of firing material extended little more than 0.5m from the limit of the excavation. From this southern extremity, the mound rose to the north to a maximum height of 0.65m at the northern limit of the excavation. No cut features were exposed during the excavation.

Burnt Mound 2, 303104.7 231270.2
The realigned Griffeen crosses the course of the old river at two locations. To allow for the excavation of the first of these crossings it was necessary to divert the Griffeen into a third channel. During stripping prior to this channel being dug the second burnt mound was found. During the topsoil removal this site was identified as an irregularly shaped deposit of firing material (heat-shattered stone and blackened soil).
The area of excavation measured 13m east-west by 17.5m. A silted-up streambed abutted the southern part of the mound. The stream appears originally to have flowed from east-north-east to south-west. It had a width of 3-5m, but the length could not be discerned as it extended beyond the limit of excavation. The stream fill contained water-rolled stones, pebbles and a dark-grey silt with a minimum depth of 0.1m. Wood residue, possibly alder, was in evidence here and was probably indicative of remnants of fen woodland. This stream system is likely to have been the reason for siting the burnt mound at this location.
One of the earliest features on the site was a grouping of stake-holes cut into the clayey peat. These formed a semicircular band. All were comparable in shape and size and all contained

the same fill. They ranged in depth from 5mm to 2mm with a diameter of 6-12mm. Small amounts of heat-affected pebbles and small stones around the sides of the stake-holes may be evidence for packing material. The function of the complex is not clear. Some stake-holes are vertical, while others have been driven into the ground at an angle. They follow a vague northeast to south-west pattern, but the angled stakes do not appear to offer support to each other or to any possible structure.
The burnt mound was situated on the northern bank of the silted up stream. The bank was steepsided. The main concentration of firing material is in the west. No evidence for a trough was found and the only evidence of activity associated with the burnt mound appears to be the stake-hole complex. The mound measured 11m east-west by 4.5m. It is more likely that the original east-west dimensions were closer to being 6m, with a depth of 0.12-0.25m.
Covering and surrounding the burnt mound was a layer of peat measuring 4.64m from north to south by 14.7m, with a surviving depth of 0.2-0.45m. This was a moist dark-reddish-brown peat of moderate compaction that contained inclusions of sphagnum moss, plants and wood. It was most pronounced to the south of the burnt mound, sloping downwards to the stream. A third burnt mound was recorded during the course of the topsoil-strip. The site was not fully exposed but was identified by a number of concentrations of the characteristic firing material. This site was not impacted on by the development and it was possible to preserve it in situ. It was first sealed using a double layer of geotextile material and then covered by a soil bund forming the boundary between the business park and the pitch-and-putt course.
Red Tobin, Margaret Gowen & Co. Ltd, 27 Merrion Square, Dublin 2.

Excavation No.: 2004:0616
Location: Finnstown (Finnstown House, Newcastle Road, Lucan)
Site Type: No archaeological significance
Licence No.: 04E0522
An assessment including testing was carried out at Finnstown House, Lucan, Co. Dublin. The development plans included the demolition of a single-storey building and the erection of a two-storey building, with a pedestrian link at ground level and stairs/lift enclosure abutting an existing two-storey building. The plans also include the renovation of existing two-storey outbuildings/coach houses. A medieval tower-house was noted within Finnstown House during the course of this assessment. This tower-house will not be impacted upon by the development. Testing was carried out in the walled garden area and within the footprint of the proposed new building. The north-eastern end of the trench comprised 1m of infill material. This material was dumped during recent construction work and was then levelled out. It comprised wood, stone, plastic and modern ceramics. This material lay on the natural subsoil, which was light-brown to yellow clay. The south-western extent of the trench comprised c. 0.3m of topsoil, which consisted of stony light-brown clay with a grey hue. Some red brick and willow-pattern pottery was noted in this topsoil layer. The natural subsoil lay under the topsoil and appeared to be consistent throughout the site. No features or finds or archaeological significance were uncovered in this trench.

Excavation No.: 2005:379
Location: Adamstown
Site Type: Urban burial ground
NGR: E 703029m, N 732827m
Licence No.: 05E1295
Human remains were located within the road-take of the Adamstown link road (ALR) at the rear of the old Lucan train station adjacent to the Ascon compound in Adamstown, Dublin. The investigations involved the excavation of human remains uncovered during the course of topsoil-stripping in advance of the construction of the ALR. The excavations entailed the lifting of 36 full or partial skeletons and eight disarticulated skeletons. Two linear features and two deposits were also excavated at the site.
The skeletal remains were primarily orientated in a west–east direction, with heads to the west, but a number were aligned slightly along a south-west/north-east axis and two along a north-west/south-east axis. All were in simple graves, with no traces of any coffins or grave-markers. They appeared to represent 43 adults and one infant. A single find uncovered with a burial was a fragment of plastic rosary beads found in the pelvic region of Skeleton 10. This find may not suggest a modern date for the burials, as they were disturbed and truncated by the railway wall, which appears to date to the 1950s. It is possible that the rosary beads were interred when the

burial was disturbed during the demolition of Lucan station or the construction of the wall that divided the site from the Dublin/Kildare railway line. Removal of the wall and build-up on its southern side revealed that skeletal remains did not extend over the northern side of the existing railway wall.
It is hoped that further post-excavation and osteoarchaeological analysis of the remains will indicate a possible date for the site.
Ellen O'Carroll, The Archaeology Company, 17 Castle Street, Dalkey, Co. Dublin.

Excavation No.: 2006:581
Location: New IAWS HQ, Grange Castle Business Park, Clondalkin
Site Type: No archaeological significance.
NGR: 30280 23110
Licence No.: 06E1161
The Grange Castle Business Park has witnessed several archaeological investigations since 2000 (O'Donovan 2004; Doyle 2005). These investigations resulted in the discovery and excavation of several prehistoric sites in the area of the Grange Castle Business Park. The Record of Monuments and Places records two castles located within the grounds of Grange Castle Business Park, namely Grange Castle DU(017–134) and Nangor Castle DU(017–037). The new IAWS HQ has an area of 9.3ha and is located at the south-west corner of Grange Castle Business Park, being bordered on the west by the R120 (Lucan road). The site was part of an extensive geophysical survey carried out by Margaret Gowen & Co. Ltd in October 2005, which revealed that the south-west corner of the site had a distinct magnetic disturbance indicative of a spread of material, possibly rubble.
All groundworks associated with the development were monitored during December 2006. The excavation of the site access road resulted in the discovery of a modern pit, a modern linear spread of angular stone, a small spread of red brick mixed with shells and several modern land drains. No features of archaeological significance were encountered during the stripping of topsoil. The programme for the monitored stripping of topsoil at the eastern portion of the site will resume in January 2007.
References
Doyle, I. 2005 Excavation of a prehistoric ring barrow at Kilmahuddrick, Clondalkin, Dublin 22. The Journal of Irish Archaeology 14, 43–75.
O'Donovan, E. 2004 A Neolithic house at Kishoge, Co. Dublin. The Journal of Irish Archaeology 12 and 13, 1–27.
Eoin Sullivan, for Margaret Gowen & Co. Ltd, 27 Merrion Square, Dublin 2.

Excavation No.: 2006:659
Location: Grange Castle Business Park (Grange, Milltown and Clutterland)
Site Type: No archaeological significance
Licence No.: 06E0777
Monitoring of ground-disturbance activities associated with the construction of a link road within Grange Castle Business Park was undertaken in July and August 2006. The link road was constructed in the west of the business park from the Takeda Factory to the Nangor Road; 1250m of single carriageway was constructed parallel to the course of the Griffeen River. The majority of the route of the link road was disturbed by the previous realignment of the Griffeen River (see Red Tobin in Excavations 2003, No. 604, 03E1210). No features or stratigraphy of an archaeological nature were identified.
Emer Dennehy, Margaret Gowen & Co. Ltd, 27 Merrion Square, Dublin 2.

Excavation No.: 2007:515
Location: Gollierstown, Dublin
Site Type: No archaeological significance
Licence No.: 07E0671
Testing was carried out in compliance with a planning condition for enabling works to facilitate the construction of the district centre at Adamstown, Lucan, Co. Dublin. The proposed development lands were in use as a compound for the railway development and, as such, the topsoil had been stripped from some of the area. A bridge has also been constructed across the lands at the western side. There are no known monuments in the development lands for the district centre and cartographic research indicates that the development site was always laid out in open fields.

Eleven test-trenches were excavated across the development site with a 1.8m-wide toothless bucket. The stratigraphy consisted of c. 0.2m of topsoil underlying subsoil on to natural stony marly soils.
Nothing of archaeological significance was recorded during the testing.
Ellen O'Carroll, 8 Cumberland Street, Dún Laoghaire, Co. Dublin.

Excavation No.: 2007:530
Location: Nangor
Site Type: Medieval, post-medieval
NGR: 30459 23122
SMR No.: DU017–037
Licence No.: 07E0588
Monitoring and testing took place between August and October 2007 within and adjacent to the Nangor Castle, Clondalkin, Co. Dublin.
The monitoring of a service trench, 400m in length, 1m in depth and 0.5–0.55m in width, revealed several archaeological features that have been tentatively identified as part of the landscaped gardens, located to the west of the RMP site and associated with the now demolished 18th-century Queen Anne house that was built on the site of the earlier Nangor Castle. The initial stage of the service trench, which was parallel to an existing access road to a gas pumping station, ran through heavily disturbed ground that contained redeposited topsoil, subsoil and road-making materials. As the monitoring trench approached the gas pumping station, a series of small stone walls, averaging 0.5m in width, separated in some instances by low banks of stone-free soil, were revealed. The walls, six in all, were located at a depth of 0.5m below the present ground surface. They consisted of stones, c. 0.2m by 0.15m or smaller, bonded together in some instances with creamy gritty mortar with fragments of red brick. One wall, F9, lay at a depth of 1m; it was 0.5m in width and appeared to be bordered by narrow pieces of wood on each side. All the walls ran in a north-west to south-east direction across the monitoring trench.
As the service trench ran to the south of the pumping station it cut through concrete floors, possibly associated with farm and cattle yards. The foundation for the floors consisted of loose stone, stone blocks and mortar and lay directly on the subsoil. Two further stone walls were revealed at the extreme eastern portion of the service trench in this area. Both ran north–south across the service trench. The walls were just under 1m in width and were revealed 0.6m beneath disturbed topsoil and fill.
As the service trench turned southwards and ran parallel with the site boundary for 120m, there was a marked difference in the ground conditions. The ground here was undisturbed. However, nothing of any significance was revealed in this area.
It should be noted that, while the monitoring did reveal landscape features possibly associated with the Queen Anne house, the rubble foundation that underlay the concrete floors in the northern portion of the site contained a considerable amount of stonework, which may be related to the 18th-century house and possibly to Nangor Castle itself. The incidence of red brick and large blocks of stone may indicate this to be the case. Areas with the constraint zone for Nangor Castle are strewn with large rough-hewn limestone blocks, possibly relating to the castle structure, although the dumping of construction waste and other waste within the area masks this to quite a degree. There was no evidence for in situ remains of the Queen Anne house or Nangor Castle revealed during monitoring.
Two phases of testing took place on the site. The initial phase took place within the RMP site and one test-trench was located across the possible remains of the Queen Anne house and the castle. It had been hoped to insert a series of test-trenches over possible subsurface remains of the Queen Anne house and castle site, but, due to a very large and unstable overburden and the desire not to impact unnecessarily on the RMP site, only one test-trench was completed.
This test-trench, located across possible structural remains in the western portion of the site, was cut through a very large deposit of construction debris, general dumping and waste, averaging between 3m and 4m in places. This overburden was extremely loose and unsound. Consequently a test-trench 6m in width was cut through this overburden and battered back for safety. Within this a slightly narrower test-trench revealed the remains of a modern concrete building at the western end of the test-trench, 3m below the original overburden. The modern structural remains were abutted by a portion of a large stone structure, over 1m in height and 1.75m in width, with a rubble core, suggesting it may be associated with or be part of Nangor Castle. The true depth of the wall was not ascertained. It appeared to run in a southwards

direction from the test-trench. Further to the east, possible remains associated with the Queen Anne house were revealed. These consisted of stone walls plastered on one side, walls of red brick and painted walls. They were revealed to be up to 1m or more in depth. Red brick from this area was identified as being very early in date. No further work was done in the area due to the instability of the overburden.

A second phase of testing took place to the south, south-east and south-west of the RMP site. A series of three test-trenches were excavated. This testing took place within a possible Early Christian 90m diameter enclosure previously identified. An area to the south-east of the RMP site and the Early Christian enclosure was also tested. The two test-trenches to the south-east revealed a redeposit of disturbed modern fill, within which lay garden features such as low banks of stone-free soil, for trees or shrubs, which may have been associated with the avenue which led up to the Queen Anne house, which was located to the immediate west. The third test-trench, which was 150m in length, ran across the previously identified Early Christian enclosure to the south-west of the RMP.

This long test-trench cut across the entire width of the enclosure, at the northern extremity, and confirmed the previous investigations and geophysical survey. The presence of a large enclosure with ditches up to 2.7m in width and over 0.7m in depth, with the possible remains of a second ditch in the western portion of the enclosure, were revealed. Previous investigations had revealed a cemetery and possible structures within the enclosure. There was considerable evidence for occupation levels, areas of burning within the test-trench and features such as pits and linear features. Finds from the original investigations by Cia McConway (Excavations 1996, No. 68, 96E0273; Excavations 1997, No. 86, 97E0116) included lignite slivers and cores, metal slag, animal bone, medieval pottery and human remains. Additional medieval pottery, green-glazed, was recovered from this second phase of testing, together with large quantities of animal bone.

The monitoring of the service trench and the two phases of testing has confirmed that this is an area of considerable archaeological activity. The location of such a large enclosure, Early Christian in date, with evidence for a cemetery and interior occupation, may have given the site considerable importance, marking it out as a significant place in the landscape. The second phase of activity, to the north and north-east of the enclosure, that of the medieval Nangor Castle, also attests to the importance of this site, as does the erection of the later Queen Anne house. The layout of the Queen Anne gardens is still clearly visible on the ground, although heavily overgrown, and the testing has shown that subsurface features associated with the gardens still exist. Possible substantial remains of Nangor Castle itself and the Queen Anne house, under a deep overburden of unstable construction fill, were also revealed, although further investigations would be necessitated to confirm this.

Sylvia Desmond, Margaret Gowen & Co. Ltd, 27 Merrion Square, Dublin 2.

Excavation No.: 2008:363
Location: Gollierstown, Adamstown
Site Type: Urban
NGR: E 701516m, N 732303m
Licence No.: 08E0197

An assessment and associated testing were in compliance with a planning condition for the construction of a post-primary school and a community centre. The proposed development is to be located to the south of the SDZ lands and adjoins the railway line. Previous testing was carried out by the author at the adjoining site for the Adamstown District Centre. There are no known monuments in the development lands for the District Centre and cartographic research indicates that the development site was always laid out in open fields.

The proposed development site is located on a brownfield site at the western edges of the Adamstown development. The lands were in use as a compound for the railway development and other developments in the surrounding area and therefore topsoil had been stripped from most of the site. Two large holding tanks at the north-west of the site, a small access road at the south and housing developments to the north-east had already been constructed in the part of the areas proposed for development prior to the author arriving on-site.

Seven test-trenches were excavated across the site with a 1.8m wide toothless bucket. The stratigraphy consisted of c. 0.2–0.4m of topsoil intermixed with debris and overlying subsoil onto natural stony marl soils at the western portion of the site where the proposed community centre is to be located. There was very little topsoil remaining at the eastern end of the

development site and the stratigraphy comprised of orange/brown subsoil overlying natural marl subsoil with veins of stone/slate running south-east/north-west across the development lands. Nothing of archaeological significance was recorded during testing.
Ellen O'Carroll, 8 Cumberland Street, Dun Laoghaire, Co. Dublin.

Excavation No.: 2013:043
Location: Grange/Ballybane/Nangor, Dublin
Site Type: Furnace pit (monitoring)
NGR: E 703978. N 703391m
Licence No.: 13E0435
Monitoring of a proposed central carriageway at Grange Castle Business Park, Co. Dublin was carried out from 1-8 November 2013. Monitoring followed an archaeological appraisal carried out in September 2013 and geophysical survey was previously carried out throughout the entire area of Grange Castle Business Park.
Two features of archaeological interest were identified during monitoring of topsoil stripping in the east of the development area in Nangor townland. These features comprised a small bowl furnace (0.36m x 0.33m x 0.15m) filled with charcoal-rich soil and slag, and a shallow oval pit (0.97m x 0.69m x 0.1m) filled with charcoal, thought to be a charcoal clamp. These features were located approximately 35m apart and may have been associated with each other.
It is anticipated that specialist analyses in the form of charcoal analysis, radiocarbon dating and metallurgical analysis will be carried out on the material retrieved from the features excavated at the site
Courtney Deery Heritage Consultancy, 65 Mountain View Drive, Boghall Road, Bray, Co. Wicklow

Excavation No.: 2013:196
Location: Grange, Dublin
Site Type: No archaeology found
Licence No.: 13E0459
Testing was carried out at the site of a proposed biopharmaceutical plant in Grange Castle Industrial Park, Co. Dublin. The entire development site is approximately 11ha in size however the proposed plant will be built on the southern 7.5ha of the site, leaving the northern portion available for future expansion. Only the southern 7.5ha was subject to testing. A total of 15 trenches, measuring 2,585 linear metres, were excavated across the area of proposed development over the course of four days from 9 December 2013. Nothing of archaeological significance was identified during this programme of testing.
Fintan Walsh for IAC Ltd, Unit G1, Network Enterprise Park, Kilcoole, Co. Wicklow

Excavation No.: 2013:521
Location: Grange/Ballybade/Nangor, Co. Dublin
Site Type: Iron Age smelting pit and early medieval charcoal clamp
NGR: E 703873m, N 731566m
Licence No.: 13E0435
Archaeological monitoring of a proposed central carriageway at Grange Castle Business Park, Co. Dublin was carried out from 1-8 November 2013 (east of Pfizer Ireland). Monitoring followed an archaeological appraisal carried out in September 2013 and geophysical survey was previously carried out throughout the entire area of Grange Castle Business Park.
Two features of archaeological interest were identified during monitoring of topsoil stripping in the east of the development area in Nangor townland. These features comprised a small bowl furnace (0.36m x 0.33m x 0.15m) filled with charcoal rich soil and slag, and a shallow oval charcoal clamp (0.97m x 0.69m x 0.1m). These features were located approximately 35m apart and it was initially thought that they could have been associated, however the dating evidence has indicated otherwise.
The furnace pit contained 1.26kg of metalworking residues and constituted the base of a typical slag-pit furnace. A sample of oak charcoal from fill C3 of the furnace pit returned a radiocarbon date of 2403+/-30 BP (UBA 25347), which was calibrated to 732-400 BC (2 Sigma) dating this feature to the early Iron Age. This radiocarbon date is one of the earliest to come from an Irish iron smelting context to date (Rondelez, 2014). (ITM 703873E 731566N).

A sample of oak charcoal from fill C7 in the charcoal clamp returned a radiocarbon date of 1256+/-32 BP (UBA 25348). The 2 Sigma calibrated result for this was 671-867 AD dating this deposit to the early medieval period. (ITM 703843E 731580N).
The features discovered at the site have been excavated and "preserved by record" and as such no further mitigation measures are necessary in relation to this development, however future development of the adjacent areas have the potential for further isolated small features to be discovered.
Courtney Deery Heritage Consultancy, Lynwood House, Ballinteer Road, Dublin 16

Excavation No.: 2015:268
Location: Grange Castle Access Road, Grange Castle, Dublin
Site Type: No archaeology found
Licence No.: 15E0392
An archaeological assessment was undertaken for a site at Grange Castle Access Road, Grange, Dublin 22, on a 2.02 ha site. The site was a green field area within an industrial estate off the Nangor Road. The site of a tower-house (Grange Castle) lies 400m to the south. No archaeological features were recorded in the course of the assessment.
Aidan O'Connell for Archer Heritage Planning Ltd, 8 Beat Centre, Stephenstown, Balbriggan, Co. Dublin

Excavation No.: 2016:049
Location: Gollierstown, Aungierstown, Ballybane, Dublin
Site Type: No archaeology found
NGR: E 763222m, N 730681m
Licence No.: 15E0551
MOORE GROUP undertook a programme of archaeological testing at two sites in West Dublin as part of the development of a 220/110 kV Substation in a green field site at Ballybane/Aungierstown and the development of an interface compound at nearby Kishoge, South County Dublin. Earthsound Archaeological Geophysics carried out surveys of the proposed development works at both sites in October 2015 (detection Device no. 15R0116). At the interface site in Kishoge dipolar anomalies detected suggested that the land has been used for the deposition of debris or imported soils, causing the magnetic interference. This interference appeared to be truncated by a number of possible ditches which, it was suggested, relate to underlying features or may be an artefact of the deposition of the debris or imported soils. At Ballybane, the proposed sub-station site, a series of circular and sub-circular trends were detected across the northern survey area. These were interpreted as representing archaeological ditches or geological trends. Testing involving the mechanical excavation of twelve trenches was carried out from 22-24 February 2016 in bright and dry conditions.
Ballybane Site
The proposed substation site was accessed via a new business park access road south of the New Nangor Road (R134). The site consists of an improved tillage field to the north, cut by a ditch to the south. The field was originally subdivided into a smaller sub-triangular plot, the boundary of which has in recent years been cleared away. Due to regular ploughing the site was relatively even underfoot. The test trenches were excavated by a 15-tonne backhoe excavator using a 1.2m-wide ditching bucket. All the test trenches were deliberately sited to target sub-surface anomalies identified during the geo-physical survey. These anomalies were variously interpreted as possible pits, ditches or relict boundaries. Trench 1 was located in the north-west corner of the site in relativity even ground. The trench measured 24m in length and was dug to an average depth of 0.5m. The topsoil was a rich humic material and the subsoil contained a high inclusion of angular stones. The only notable feature was a drainage channel at the west of the trench and was orientated north to south.
Kishoge Site
The proposed interface compound at Kishoge is located to the south-east of a roundabout at the junction of the R136 and the Ninth Lock Road. The field contains a high voltage tower with power lines overhead; the ground is of rough pasture with evidence of previous infill. This infilling was confirmed by the geophysical results, frequent 'iron spikes' were interpreted as relating to the importation of soils/debris. Three trenches were excavated across this area. Groundworks exposed a disturbed stratigraphy of imported builders' rubble and topsoil that had been dumped on the site. Subsoil, a boulder clay, was exposed at 1m in depth. There were no finds or features of archaeological potential.

Moore Archaeological and Environmental Services Ltd. Corporate House, Ballybrit, Business Park, Ballybrit, Galway.

Excavation No.: 2016:083
Location: Dub06 Data Centre, Grange Castle Business Park, Ballybane, Dublin 22
Site Type: Bronze Age - Early Medieval
Licence No.: 13E0471

The initial excavation comprised extensive test trenches over a large area within Grange Castle Business Park, County Dublin, on behalf of Microsoft Operations (Ireland) Ltd, in advance of a Data Centre complex. Test trenching began in January 2014, confirming the results of a geophysical survey carried out in 2004, identifying a circular enclosure in one portion of the site, known as Area 11, and two burnt mounds in another portion, known as Area 9. The excavation of Area 11 began in May 2014 and additional, associated, enclosures came to light leading to a prolonged excavation continuing on an intermittent basis until January 2016. The excavations in Area 9 took place in July 2014. Monitoring continued elsewhere in lands impacted by the construction works, with the subsequent recovery of more isolated features.

Area 11

The excavation of Area 11 revealed a series of associated enclosures aligned north-south. The earliest enclosure, Site 3, comprised a circular penannular ditch, with a maximum diameter of 48m, and maximum depth of 1m. Finds within the ditch included iron knives, a pair of mismatched quernstones, and a cluster of cow skulls. An upended cow skull, with human femur, provided an AMS date 656-727 and 737-768 CAL AD.

The ditch was encircled by the penannular Site 4 ditch, maximum diameter 86m, which also contained cow skulls. Both Site 3 & 4 enclosures shared a south-western entrance way. The Site 4 ditch was preceded by a linear, and more shallow, east-west ditch running across the north end of the site for a distance of 86m. The large D-shaped Site 2 enclosure, 40m x 32m, attached itself to the southern arc of the Site 4 ditch. Much reworked and augmented, the ditch cut through the underlying limestone bedrock to a maximum of 0.9m.

A portion of the old ground surface was recovered within this enclosure as well as the burial of a male and female, within a shallow grave, aligned north-south. Other finds included an articulated sheep or goat within a shallow pit, and a complete horse pelvis and femur.

The smaller Site 1 enclosure comprises two concentric ditches, 14.7m diameter maximum. An occupation surface of redeposited clay set it apart from the larger ritual enclosures, as did the numerous stake-holes, post-holes, and kiln, within the interior. A wattle fence survived in what appears to be a later recut ditch within the enclosure. Much of the clay deposits were characterised by large amounts of charcoal, both in the fills of internal pits, and the ditches. Cremated bone was also recovered, raising the possibility of ritual feasting and / or a funeral pyre being situated here.

A significant feature of the enclosures is the deliberate linking of each ditch to one another. In the case of Sites 3 & 4, a shallow ditch provides the connection. Site 2 was then physically attached to the Site 4 ditch. In the case of Site 1, a ditch emanates from its outer enclosure almost to the lip of the Site 2 ditch.

The burial of two individuals within a shallow grave, the cluster of cow skulls, the deposition of a cow skull with human femur, as well as the insertion of mismatched quernstones, all indicate substantial ritual and ceremonial uses, probably including animal sacrifice. The continuation of pre-Christian rituals is not unprecedented but is stark in view of the nearby presence of Clondalkin monastic settlement.

Several post-1169 medieval ditches ran up to, aligned themselves to the enclosures.

Area 9

Two fulacht fiadh were situated in a waterlogged field. The remains to the west comprised a shallow unlined trough, a well and several pits, including a recut pit indicating a second phase of use, as well as a spread of heat-shattered stones. Finds included fragments of human bone in a deep pit.

Thirty metres to the east, another fulacht fiadh comprised troughs, pits, numerous stake-holes and an elongated gully. The stake-holes, and an associated deep trough, appear to belong to a second phase of use. The findings tend to support the hypothesis of intermittent communal feasting.

Other archaeological sites have since been excavated within the Data Centre complex, although none to the same scale as those described above. They include a Bronze Age structure, and a possible Neolithic structure. A summary will be submitted in due course.

Excavations were also carried out in an adjacent associated site under licence 14E0453 in the townland of Nangor revealing a corn-drying kiln, medieval field boundaries as well as two clusters of cremations pits.
Neil O'Flanagan, Botanic Court, 30-32 Botanic Road, Glasnevin

Excavation No.: 2016:084
Location: DSF, Grange Castle Business Park, Dublin 22, Dublin
Site Type: Bronze Age cremation pits & medieval corn-drying kiln
Licence No.: 14E0453
Excavations were carried out on behalf of Sisk & Sons Ltd during the course of 2015-16, yielding a corn-drying kiln, medieval field boundaries, and two clusters of cremation pits.
The kiln was dumbbell shaped, 6.06m in length, 1.4m wide across its flue, and cut to a depth of 0.48m. The fill included clays that appear to have originally formed part of the roofing of the kiln, indicating that the roof collapsed after its use, to be followed by a gradual natural accumulation.
The kiln lay adjacent to a pair of parallel ditches, one of which extended to 38m within the monitored area, with a depth of 0.25m maximum.
Some distance to the south, a cluster of 5 cremation pits came to light, with burnt bone within the pits evident from the surface. The pits were cut to a depth of 0.32m maximum, and a diameter of 0.37m maximum. Further to the south, another cluster of 4 cremation pits, including a shallow oval-shaped pit, measuring 0.57m in length, and 0.07 in depth, and another circular pit 0.48m in diameter, and 0.14m in depth. Some of the pits appear to have been 'capped', or sealed.
Neil O'Flanagan, Botanic Court, 30-32 Botanic Road, Glasnevin, Dublin 9

Excavation No.: 2016:094
Location: Ballybane and Aungierstown, Dublin (South County), Dublin
Site Type: No archaeology found
NGR: 250m from 'the zones of notification' for RMP's DU021-108 & DU021-109 a concentric enclosure and an enclosure
Licence No.: 16E0030
Archaeological testing at the site of a proposed substation site at Ballybane and an interface compound at Kishoge, Co. Dublin was undertaken between the 22nd and 24th of February 2016. The test trenches were purposely sited on both sites to provide coverage for the new development and to investigate geophysical anomalies identified in an earlier survey. The trenches exposed a number of modern drainage channels across the site and a natural sterile stratigraphy elsewhere. The anomalies can be accounted for by modern disturbance, drains and geology. There was no evidence for any features of archaeological potential.
Billy Quinn for Moore Archaeological and Environmental Services, 3 Gort na Ri, Athenry, Co. Galway

Excavation No.: 2016:147
Location: Grange Castle Business Park, Clondalkin, Dublin
Site Type: Early modern agricultural activity
NGR: E 703773m, N 732160m
Licence No.: 15E0394
Testing and monitoring were carried out at Grange Castle Business Park, Clondalkin, Dublin 22, on behalf of Interxion Ireland in advance of the construction of a new data centre. Testing (followed by monitoring as a extension to the existing licence in January 2016) was required as a condition to grant of planning (SD15A/0034: Condition 11 b) from South Dublin County Council.
The 7 test trenches (totaling 229m) were aligned to investigate a faint geophysical trend (c. 23m in diameter) that was identified during geophysical survey of the site in January 2015. The trenching did not reveal any features of considered archaeological significance but did identify a furrow, some oxidised soil, brick waste and evidence of modern ploughing.
The testing report recommended monitoring of the soil strip – due to the wider archaeological/historical significance of the surrounding landscape and the small percentage of the development's footprint that was assessed through the initial testing.
Monitoring was undertaken over two days in January 2016 and exposed evidence for agriculture (furrows) and land improvement (drains) on the site in the early modern to modern

period; isolated spreads of burnt clay, brick and charcoal (which were also frequently contained in the backfill of the agricultural features) indicate contemporary light industrial in the vicinity of the site – the brick inferring such activity may have been associated with a brickfield/brick firing and/or the demolition of brick buildings. However, no features of considered archaeological significance were recorded. The site was fully reduced to the level of natural subsoil under archaeological supervision.
Number 1, Brendan Street, Birr, County Offaly

Excavation No.: 2016:340
Location: Adamstown Road (R120) and Nangor Road (R134) Improvement Scheme, Ballybane, Ballymakaily, Clutterland, Grange and Milltown
Site Type: Post-medieval structure
NGR: 702670, 731650
Licence No.: 16E0520
The development is intended to improve the standard of the existing carriageway on both the Adamstown Road and Nangor Road, and will provide footpaths, cycle tracks, pedestrian crossing facilities, public lighting and two new signalised junctions. The overall length of the scheme is 2.45km. The excavation of six test trenches located throughout the proposed development area failed to reveal any archaeological features or artefacts.
Test trenching in Milltown townland, immediately west of Adamstown Road, revealed two associated mortar-bonded stone walls. The walls appeared parallel, and were 25m apart, forming the gables of a structure that was orientated north-east/south-west. A concrete floor was continuous throughout the structure at a depth of 0.4m below the existing ground level. A structure is depicted in this location on the First Edition Ordnance Survey map.
Dermot Nelis, 36 Fingal Street, Dublin 8

Excavation No.: 2016:464
Location: Grange Castle South Business Park, Ballybane, Clondalkin, Dublin 22.
Site Type: Early medieval/medieval enclosures
SMR No.: DU021:108 & DU021:109
NGR: 703029, 730829
Licence No.: 16E0531
The areas tested were identified initially from studies of aerial photography and geophysical survey results and a very close correlation between the test trenching results and the results of the geophysical survey was noted.
AH1 represented a recorded concentric enclosure (DU021-108) with an internal ditched enclosure measuring c.50m east to west and 60m north to south and an outer ditched enclosure measuring c.90m in diameter. The test trenching confirmed the presence of extensive and well preserved internal and external ditches measuring 4m wide and 1.80m in depth below the current ground level. Numerous internal features were identified which comprised a group of linear type features and pits all of which are suggestive of domestic activity within the enclosure. The enclosure is likely to represent an early medieval settlement site.
AH2 was located 100m to the south of AH1 and represented a probable circular enclosure measuring 25m in diameter. The test trenching clearly identified the presence of a single – ditched circular enclosure measuring between 20m to 25m in diameter, with the ditch averaging 3m in width. The ditch was present within three test trenches and probably represents a ringfort or similar enclosure.
AH3 was described in the geophysical survey as a negative band of data oriented southwest-northeast and extending into the adjacent field which may represent a former track-way. The test trenching of this feature recorded two linear parallel ditches both measuring 3m wide by 1.60m deep that appear to form an old abandoned road or track. Both ditches contained old terracotta land drainage pipes suggestive of a relatively modern date for these two features.
AH4 was located in the east of the northern most field and was identified in the geophysical survey as a cluster of isolated responses which may represent a spread of burnt material or cluster of small pits and larger, isolated pit-type features. Archaeological test trenching in this area failed to identify any features of an archaeological nature. The ground was quite disturbed in this part of the site and it would appear to have been subject to test trenching previously.
AH5 represented an enclosure (DU021-109) located in the southern field, measuring c.44m with a probable entranceway in the east. The archaeological test trenching confirmed the presence of a single-ditched circular enclosure, 44m in diameter with the ditch measuring 3m

wide and 1.60m deep. The general appearance of this feature is suggestive of a possible ringfort type enclosure. No internal features were recorded.
AH6 represented a circular internal ditched enclosure measuring c. 37m in diameter encompassed by a larger oval-shaped enclosure measuring c.75m x 42m. The test trenching confirmed the presence of the large elongated oval enclosure measuring approximately 75m north-south by 42m east-west with a smaller associated internal enclosure c. 37m in width containing features suggestive of occupation. The external ditch of this enclosure measured on average 2.60m wide and 1.60m deep. The site is likely to represent a multi-phased early medieval settlement site.
AH7 was identified in the geophysical survey as a series of circular and sub-circular trends and five possible pits which may be archaeological or agricultural in origin. The test trenching failed to identify any features of an archaeological nature. A field boundary was recorded containing old terracotta land drainage pipes suggestive of a relatively modern date.
AH8 was identified in the geophysical survey as a series of linear negative magnetic trends which were suggestive of archaeology. The test trenching of this area failed to identify any features of an archaeological nature. A field boundary was recorded containing old terracotta land drainage pipes suggestive of a relatively modern date.
Within Field 1, two sections of a possible linear double ditched type feature were recorded with curving u-shaped termini (AH 9-10). These two parallel ditches may form a linear boundary and one of the ditches was clearly identified by the geophysical survey. An archaeological section excavated through one of these ditches recorded its width as 2.5m and depth as 1.45m in depth. The deposits recorded within this section appear similar to that recorded within area AH1 and contain no modern materials suggestive of modern field boundaries.
The geophysical survey and the results of archaeological test trenching clearly indicate that the site contains significant archaeological remains including four separate enclosure sites, two of which are scheduled for inclusion in the next revision of the Record of Monuments & Places. Although preservation in situ of archaeological remains should always be the preferred option, where such can be accommodated within any proposed development, the present site is located with a partly developed business park and any future development here is likely to extend to the entirety of the two fields resulting in an inevitable impact on all identified archaeological features. Any proposed development of this site should take into account the surviving archaeological remains and where possible the development should be designed to avoid the archaeology.
Jon Stirland, Will O'Siorain, Robert Breen, Archaeological Consultancy Services Unit, Unit 21 Boyne Business Park, Greenhills, Drogheda, Co Louth

Excavation No.: **2016:495**
Location: Grifols Phase 2 site #B201, Grange Castle Business Park, Grange
Site Type: Testing, monitoring and excavation (Isolated pits)
NGR: 703500, 731930
Licence No.: 13E0459
Testing (Phase 2) was undertaken within the footprint of a proposed biopharmaceutical plant at Grange Castle Business Park, Nangor Road, Grange, Dublin 22 in 2016. This testing followed from a previous phase (Phase 1) of testing undertaken in the southern half of the development site (2013:196), under an extension to licence 13E0459. A total of 13 test trenches were excavated within the Phase 2 development area.
One archaeological feature (AA 1: a pit filled with charcoal-rich soils) was identified. Subsequent monitoring of the Phase 2 development area in late 2016 identified an additional six archaeological areas (AA 2–7) all of which are individual pits/spreads similar to AA1. These areas were excavated under an extension to 13E0459 in December 2016.
Fintan Walsh, IAC Ltd, Unit G1, Network Enterprise Park, Kilcoole, Co. Wicklow

Excavation No.: **2016:530**
Location: Grange Castle
Site Type: Tower-house
SMR No.: DU017-034
NGR: 703859, 731879
Licence No.: 16E0510

Site investigation works associated with a programme of conservation at Grange Castle, Clondalkin, Dublin 22 (OS Sheet 17) by South Dublin County Council took place in October 2016. IAC Ltd monitored these groundworks.
The original structure of Grange Castle (DU017-034) dates from c. 1580 and has an 18th-century, two-storey addition attached to its western elevation. The overall footprint is 6m x 16m. While the buildings were inhabited until the 1970s, they are now in a state of dilapidation. There is significant build-up of vegetation including tree and shrub growth to the external walls of the castle as well as to the internal floors at ground floor level and at first floor level over a deep arch to the original castle.
Monitoring was carried out in October 2016 and a total of eight pits were excavated. The pits revealed that both the Georgian house and the earlier tower-house possess shallow foundations. Nothing of archaeological significance was identified within the pits surrounding the house and tower-house.
Paul Duffy, IAC Ltd, Unit G1, Network Enterprise Park, Kilcoole, Co. Wicklow

Excavation No.: 2017:042
Location: Adamstown Road (R120) and Nangor Road (R134) Improvement Scheme, Ballybane and Milltown townlands
Site Type: No archaeology found
NGR: 702620, 731140
Licence No.: 16E0520 Ext.
The development is intended to improve the standard of the existing carriageway on both the Adamstown Road and Nangor Road, and will provide footpaths, cycle tracks, pedestrian crossing facilities, public lighting and two new signalised junctions. The overall length of the scheme is 2.45km. Test trenching in Milltown townland, immediately west of Adamstown Road, in 2016 (Licence No. 16E0520) revealed two associated mortar-bonded stone walls. The walls appeared parallel and were 25m apart, forming the gables of a structure that was orientated north-east/south-west. A concrete floor was continuous throughout the structure at a depth of 0.4m below the existing ground level. A structure is depicted in this location on the First Edition Ordnance Survey map.
Additional test trenching in April 2017 confirmed the structure to be built directly on geologically deposited strata, and no associated or earlier phases of activity were noted. A test trench was also excavated in Ballybane townland in April 2017, and no archaeological features or artefacts were noted.
Dermot Nelis, 36 Fingal Street, Dublin 8

Excavation No.: 2017:411
Location: Ballymakaily, Grange Castle Business Park
Site Type: Urban monitoring
NGR: 703002, 732209
Licence No.: 16E0471 ext
Testing and monitoring was conducted in advance of a proposed development of a new Data Centre, and associated works, in Ballymakaily Townland, Clondalkin, Dublin 22. The site is in close proximity (800m) to Grange Castle (DU017-034—) as well as a range of other upstanding remains and sub-surface archaeological sites. This archaeological work followed a previous phase of testing undertaken by Finola O'Carroll in 2016 in the southern portion of the site. The licence was extended and transferred in January 2017.
Testing and monitoring were required as a condition of planning (Planning Ref. No. SD16A/0345; South Dublin County Council – Condition 12). Testing of the site was completed by mechanical excavator in February 2017. Seven trenches were positioned to investigate anomalies identified during a previous geophysical survey. Monitoring was also undertaken, under the same licence, in April 2017 in advance of a soil strip associated with the construction works (specifically an attenuation pond). No features of archaeological significance were recorded in either phase of works. However, considering the discovery of archaeological remains in the wider region (including Neolithic Houses, Bronze Age Settlement, Ring-Barrows and an Early Medieval Complex) monitoring was recommended for any and all future works.
Denis Shine, CRDS Ltd.

Excavation No.: 2017:597
Location: Grange
Site Type: No archaeology found
NGR: 703293, 731784
Licence No.: 17EO257
Archaeological monitoring and testing were undertaken as a condition of planning prior to the construction of an extension to the existing Takeda Ireland pharmaceutical plant within Grange Castle International Business Park in south Co Dublin. Previous archaeological investigation in the vicinity of the development site exposed a Neolithic house, a Bronze Age ring barrow and numerous fulachta fiadh. Earlier archaeological monitoring and excavation in the vicinity of Grange Castle identified a curving ditch orientated NE/SW with the contents suggesting a date phase of 12th/ 13th century.
The overall site area was approximately 17 hectares and the location of the new production facility as well as lands scheduled for the temporary construction compound and car park were tested in advance of the initial phase of the groundworks. A total of eight test trenches were mechanically excavated. Testing at the site compound and temporary car parking area at the western side of the development site revealed that the area had previously been stripped of topsoil and filled with modern inert material. Monitoring of topsoil removal on the footprint of the production building site exposed the partial remains of a nineteenth century building indicated in the 1st Edition OS map for the area. This survived as a localised spread (2m NS/1.7m EW) of red brick and fragmented limestone. No other features or finds of archaeological or cultural heritage value were exposed during topsoil stripping at the development site.
Margaret McCarthy, Rostellan, Midleton, Co. Cork

Excavation No.: 2019:252
Location: Ballymakaily
Site Type: Enclosures and other features
NGR: 702480, 731800
Licence No.: 19E0038E
Archaeological excavations were undertaken by Archaeological Management Solutions in collaboration with Cultural Resource Development Services at Ballymakaily townland, Grange Park Business Park, Co. Dublin, over a 16-week period, from May to August 2019. The excavation was conducted in advance of proposed industrial development and followed on from geophysical survey and test investigations at the site in early 2019. This work revealed the buried remains of a significant archaeological complex that was thought to comprise a long-running ditch suggested to form part of an ancient field system (Area 1); a small spread of burnt stones of potential prehistoric date (Area 2); and a large, circular enclosure, possibly defined by two, widely-spaced concentric ditches (Area 3).
Full excavation of these areas revealed an impressive array of features associated with multi-phase settlement and agricultural activity, possibly extending from prehistoric to modern times. The principal remains were identified in Area 3 and comprised two successive phases of enclosure. Potentially the earliest was a large, roughly circular enclosure seemingly defined by two widely-spaced ditches, set c.15–20m apart. It had an overall (north–south) diameter of about 70m, with the inner boundary reaching a maximum diameter of c.30m. The area between the enclosing elements was traversed by a number of possible radial ditches that may delineate the footprint of several small fields or paddocks. This phase of enclosure appears to have been followed by the construction at the same location of a large, sub-circular ditched enclosure, with maximum overall dimensions of 50m north–south by 52m. It overlapped with the Phase 1 inner enclosure ditch on the south and east, and the Phase 1 outer enclosure ditch on the north and west, thereby erasing all trace of the earlier cuts and deposits. Both phases of enclosures produced evidence for internal occupation in the form of several possible circular structures/buildings, as well as pits, post-holes, spreads, etc., while their defining ditches were likely originally accompanied by internal earthen banks. The enclosures are probably early medieval raths, though this interpretation is tentative pending the results of post-excavation analyses.
A number of possible ancillary features were identified immediately outside the main enclosures, on the north and north-west. This included a small sub-circular enclosure defined by ditch that measured approximately c.18m in diameter. The ditch, which splayed outwards on the north-east and produced tentative evidence to indicate the former presence of an external bank, was breached by three gaps on the north, north-west and south-east, one or

more of which may represent an original entrance. A small pit containing a few fragments of burnt bone was the only feature discovered within the interior of the enclosure. A small, C-shaped ditch (length of chord c.16m) was also discovered a short distance to the north-east of the main enclosures and was found to contain three discrete deposits of charcoal-rich soil. These external features cannot readily be assigned to any particular phase in the site's history and further work is required to determine their precise dating and significance.
The investigations did, however, produce limited evidence for potential pre-enclosure (prehistoric?) activity in Areas 2 and 3, where a series of pits containing charcoal-rich soil and burnt stone were identified. These features may be indicative of cooking and/or other related activities. An array of linear and curvilinear ditches and drains were also identified across the site and appear to be associated with post-enclosure (medieval/post-medieval) agricultural practices. The long-running linear ditch identified in Area 3 may likewise relate to post-medieval agriculture.
Ger Dowling, AMS Consultancy, Unit 1, Hector Street Mills, Kilrush, Co. Clare.

Excavation No.: 2021:267
Location: Ballymakaily and Grange, Lucan, Dublin 22, Dublin
NGR: E 702935m, N 732180m
Licence No.: 21E0147
The development site measured c.77,000m2 (c.7.7 hectares). A number of archaeological investigations had been carried out on the site in 2016–17 in response to planning conditions informed by an Environmental Impact Statement (Marston Planning Consultancy 2016). The site was subject to a geophysical survey in 2016 (Licence No. 16R0070, Leigh 2016), and two phases of archaeological test-trenching (Licence No. 16E0471, O'Carroll 2016; and Licence No. 16E0471 ext., Shine 2017). Archaeological monitoring of a topsoil strip in advance of the excavation of an attenuation pond was also undertaken at this time. No features of archaeological significance were uncovered during the testing or monitoring works; however, due to the discovery of archaeological remains in the wider region, a recommendation for further monitoring of works within the northern portion of the site was made in the Test-Trenching and Monitoring Report (Shine 2017, p.13).
AMS was contacted (17 February 2021) to carry out any outstanding monitoring in advance of the latest phase of construction on-site. No finds or features of any archaeological significance were uncovered during this phase of archaeological works.
No further archaeological works were recommended for the site.
c/o AMS, Fahy's Road, Kilrush, Co. Clare

APPENDIX 11.4

NATIONAL INVENTORY OF ARCHITECTURAL HERITAGE

PREPARED BY CRDS LTD.

The recorded archaeological sites within the vicinity of the proposed development are listed below, all noted in the National Inventory of Architectural Heritage (NIAH) for Co. Dublin (www.archaeology.ie; www.buildingsofireland.ie).

Milltown, South Dublin County

Reg. No.	**11208006**
Date	1840 - 1860
Previous Name	N/A
Townland	MILLTOWN (NE. BY.)
County	South Dublin County
Coordinates	302518, 230958
Cat. of Special Interest	ARCHITECTURAL
Rating	Regional
Original Use	outbuilding
In Use As	outbuilding

Description

Detached two-storey farm outbuilding, c.1850, with two-bay gable ends. Rendered walls. Blind wall to street with chamfered corners. Timber sash and casement windows. Corrugated aluminium pitched roof. Adjoining rubble stone walls of demolished outbuildings to south-east and ruinous cottages to north-east.

Appraisal

The chamfered corners of this outbuilding indicate the volume of horse-drawn traffic originally passing into the farm complex. Such buildings following the road line sheltered the farm yard and were a characteristic feature of Irish agriculture. This farm was associated with the now-demolished Milltown House.

Milltown, South Dublin County

Reg. No.	**11208008**
Date	1840 - 1870
Previous Name	N/A
Townland	GRANGE (BA. W BY.)

County	South Dublin County
Coordinates	302752, 231546
Cat. of Special Interest	ARCHITECTURAL
Rating	Regional
Original Use	farm house
In Use As	farm house

Description

Detached four-bay two-storey farm house, c.1850. Roughcast rendered walls. uPVC door and casement windows. Replacement pitched slate roof with terracotta ridge tiles and gable coping. Two central brick chimney stacks. Later drip moulding over northern front window. Lean-to extension to the rere, and shed to side.

Appraisal

A tidy detached farm house which retains its original form and an unusually formal front garden, still serving the farm to the rere.

Milltown, South Dublin County

Reg. No.	**11208015**
Date	1750 - 1770
Previous Name	N/A
Townland	MILLTOWN (NE. BY.)
County	South Dublin County
Coordinates	302520, 231041
Cat. of Special Interest	ARCHITECTURAL
Rating	Regional
Original Use	farm house
In Use As	farm house

Description

Detached four-bay two-storey farm house, c.1760, with attached outbuildings. Rendered rubble stone walls. Glazed timber door in gabled porch. Timber sash windows. Some openings blocked. Possible traces of carriage arch to central bay. Pitched slate roof with two rendered chimney stacks. House possibly originally single-storey. Adjoining outbuildings to north with hayloft, and enlarged openings inserted recently. Partial tubular iron sunburst gate. Original fir tree stand to south.

Appraisal

A fine example of an eighteenth-century farm cottage and barn, demonstrating a classic sequence of vernacular evolution. Retains many period features.

Polly Hop's, Milltown, South Dublin County

Reg. No.	**11208016**
Date	1780 - 1810
Previous Name	N/A
Townland	MILLTOWN (NE. BY.)
County	South Dublin County
Coordinates	302591, 231012
Cat. of Special Interest	ARCHITECTURAL SOCIAL
Rating	Regional
Original Use	house
In Use As	public house

Description

Formerly detached four-bay two-storey former house, c.1790, in use as public house. Roughcast rendered walls with parallel render quoins. Timber casement windows. Timber door with iron fittings. Pitched slate roof with single rendered chimney stack. Series of nineteenth- and twentieth-century extensions to south and west.

Appraisal

This site has long been in use as a public house as shown by the extensions surrounding the original modest rural house. Its presence gives a focus to this important and formerly more developed junction.

R120, ADAMSTOWN (NE. BY.), DUBLIN
12th Lock Bridge, R120, BALLYMAKAILY, DUBLIN

Reg No	**11204052**
Rating	Regional
Cat. of Special Interest	Architectural, Technical
Original Use	Bridge
In Use As	Bridge
Date	1760 - 1780
Coordinates	302981, 232234
Date Recorded	16/05/2002
Date Updated	--/--/--

Description
Single-arch road bridge over canal, c.1770. Segmental arch with painted dressed voussoir stones set into smooth rendered west elevation. Roughcast rendered parapet with semi-circular coping stones and roughcast rendered pier faced with dressed granite blocks to each end. Bridge widened and refurbished, 1932.
Appraisal
This bridge, though widened, retains much original fabric and remains a valuable element in this group of canal structures including the lock gates and mill buildings.

12th Lock, R120, BALLYMAKAILY, DUBLIN


Reg No	**1204053**
Rating	Regional
Cat. of Special Interest	Architectural, Technical
Original Use	Lock
In Use As	Lock
Date	1760 - 1780
Coordinates	302957, 232232
Date Recorded	16/05/2002
Date Updated	--/--/--

Description
Single-stage canal lock, c.1770. Lock gates are of timber and iron construction with coursed granite inner walls. Painted timber mooring post at intervals between gates.
Appraisal
A good example of a standard-type eighteenth-century canal lock, enhanced by its setting among such a rich group of canal structures.

BALLYMAKAILY, DUBLIN

Reg No	**11204054**
Rating	Regional
Cat. of Special Interest	Architectural, Technical
Original Use	Mill (water)
In Use As	Office

Date	1850 - 1870
Coordinates	302938, 232247
Date Recorded	16/05/2002
Date Updated	--/--/--

Description

Detached seven-bay two-storey over basement former mill building, c.1860, now in use as offices. Random coursed rubble stone walls with roughly dressed limestone quoins. Replacement timber windows. Ground floor windows have a modern concrete surround with the original red brick relieving arches still visible. Seven large oval cast-iron building ties are located on the south front. Segmental profile corrugated iron roof.

Appraisal

Despite alteration and conversion, this former mill building associated with the Flour Mill still retains its elegance and dominance over the Twelfth Lock and bridge, and is a valuable reminder of the former variety of functions associated with the canal network.

BALLYMAKAILY, DUBLIN

Reg No	**11204055**
Rating	Regional
Cat. of Special Interest	Architectural, Technical
Original Use	Mill (water)
Date	1850 - 1870
Coordinates	302907, 232242
Date Recorded	16/05/2002
Date Updated	--/--/--

Description

Detached multiple-bay three-storey over basement former mill building, c.1860, now derelict. Roughcast rendered walls. Smooth render to the centre bays on the ground floor showing outline of former extension, now removed. A mix of boarded-up and steel-framed windows. Large door openings to ground floor of front elevation and west gable. Pitched corrugated asbestos roof.

Appraisal

This substantial former mill building fronting onto the canal, though in poor condition, retains its imposing volume and some materials, and is a valuable document of the diversity of building functions and types associated with the canal network.

Lock Keeper's Cottage, BALLYMAKAILY, DUBLIN

Reg No	**11204056**
Rating	Regional
Cat. of Special Interest	Architectural, Social, Technical
Original Use	Lock keeper's house
In Use As	House
Date	1750 - 1780
Coordinates	302847, 232228
Date Recorded	16/05/2002
Date Updated	--/--/--

Description

Detached three-bay two-storey gable-fronted classical style former lock keeper's house, c.1765, now in use as a detached house. Timber sash windows. Roughcast rendered walls with cut stone architrave and string courses, with a round-arched blind recess to the gable front. Pitched slate roof with red brick chimney stacks to each gable. Annexe to east has a hipped slate roof, timber sash windows and timber panelled door with overlight.

Appraisal

This attractive former lock-keeper's house of a standard design retains much of its original architectural impact and style. The plain string courses and classical detail contrast with the roughcast walls to a very pleasing effect. Possibly designed by Thomas Omer, it is a fine addition to the varied group surrounding the twelfth lock.

APPENDIX 11.5

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12.0 TRAFFIC AND TRANSPORTATION

INTRODUCTION

12.1 This chapter of the EIAR assesses the likely traffic impacts of the proposed development to the road network in vicinity of the site. The contents within this section of the Report provide an overview of the proposed development and estimated trip generation, relevant planning history relating to the proposal, as well as a description of the receiving surrounding environment.

12.2 The predicted traffic impact of the proposal is presented for the construction and operational phases. Remedial or reductive measures required to prevent, reduce, or offset any significant adverse effects are presented as part of the assessment.

Description of Proposed Development

12.3 The proposed development entails the provision of an underground 110kV transmission line (2.2 km long) connection between the Kishoge 110kv Gas Insulated switchgear (GIS) substation, which is located on a site within the townland of Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin, and the permitted Aungierstown – Castlebaggot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnel, Dublin 22. The proposed transmission lines provide for a loop-in connection to the permitted Aungierstgown – Castlebaggot transmission line.

The project is designed to support the power demand of development on lands adjoining the Kishoge 110kV substation.

Relevant Planning History

12.4 The 110kV Kishoge substation works have been permitted under South Dublin County Council *Reg. Ref.: SD19A/0042* and *ABP Ref.: 305948-19 on* October 2020 (*with amendments to the substation having been granted permission under Reg. Ref: SD22A/0105).* In addition to this, the planning permission has been granted for a data storage facility (Dub4) and temporary gas-powered generation development on adjoining lands under the same register reference.

A further application for a data storage facility (Dub5) and energy centre development for the site, under SDCC *Reg. Ref.: SD21A/0042,* has received notification of planning permission on 19th January 2022. *(Amendment to Condition nos. 3(ii) and (iii) of Reg. Ref.: SD21A/0042 are placed under Reg. Ref.: SD22A/0289).*

As noted in preceding section, the proposed development aims to support the power demand for the facilities described above. Dub4 is due to start construction in Q3-2022 and Dub5 in Q1 2023. All developments are expected to be operational by Q4 2024.

Site Location

12.5 The subject 110kV transmission line will extend from the Kishoge substation, in the townland of Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin, and the permitted Aungierstown – Castlebaggot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnel, Dublin 22. Figure 12.1 (overleaf) illustrates the extend of the proposal in relation to local road network.

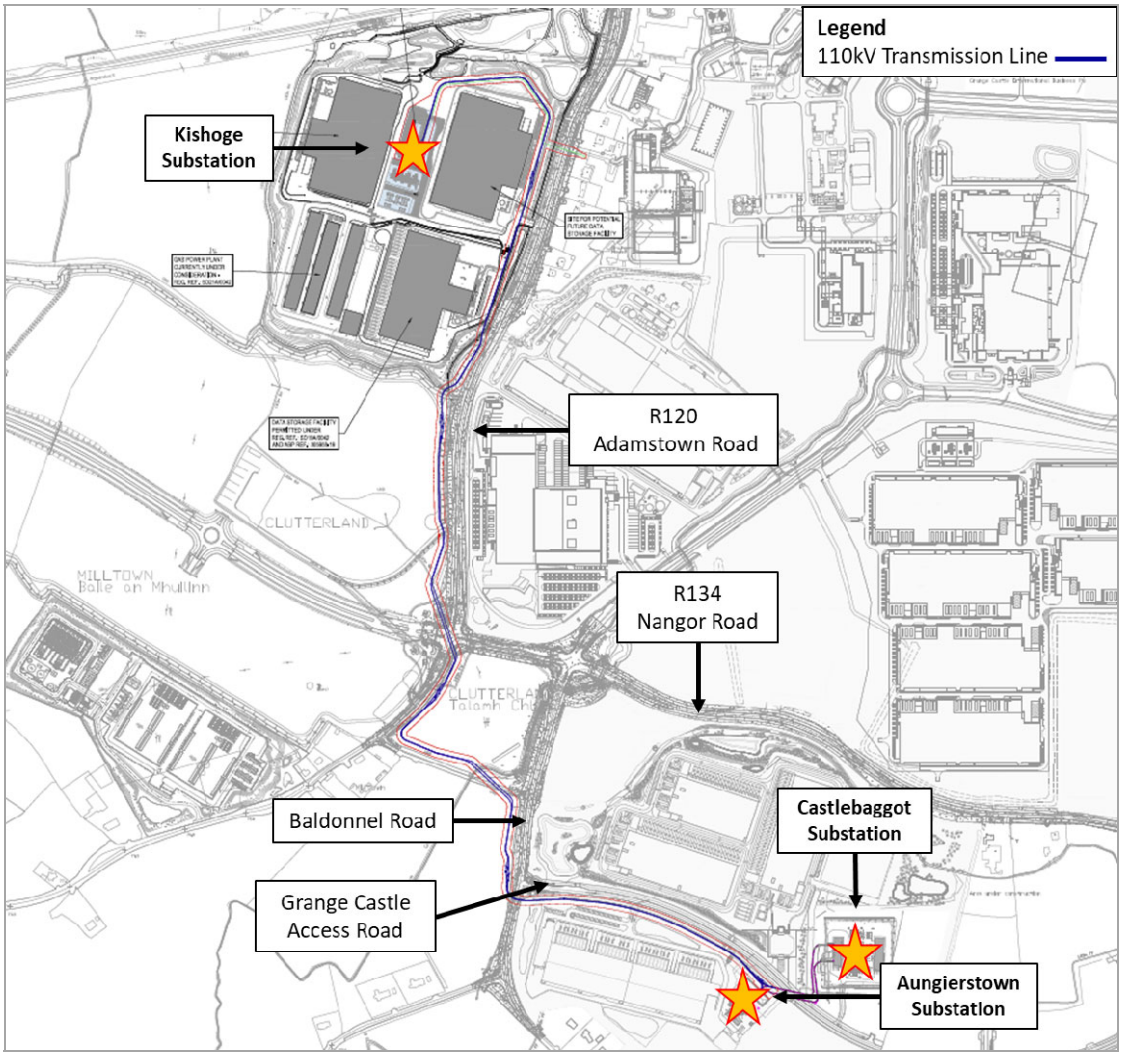


Figure 12.1: *Site Location*

12.6 As shown above (Figure 12.1), the proposed 110kV underground transmission line connections extend northwards from the Kishoge 110kV substation, before proceeding to the east and then to the south, along the periphery of the lands in the ownership of the applicant and continuing alongside the R120 towards the newly built entrance to Grange Castle West Business Park where it will cross junction with New Nangor Road (R134) by the way of Horizontal Directional Drill and enter greenfield area of Polly hops lands East of R120. It will then proceed southward along R120 and westward alongside the Old Nangor Road, crossing the Griffeen River and proceeding eastwards and then south before crossing the Baldonnel Road and

proceeding eastward within lands to the south of the Grange Castle South Park access road, before reaching and connecting to the Aungierstown – Castlebaggot underground transmission line. In total this will cover 2.2 Kilometre.

METHODOLOGY

12.7 The methodology used to assess the proposal traffic impacts is described below:

1. Establishing Baseline Conditions – To assess the proposed development's potential traffic impacts, an appreciation of the existing situation first needs to be established. The existing conditions recorded the description of surrounding road network and baseline (do-nothing) traffic volumes.
2. Estimation of Proposed 110kV Transmission Line Traffic Generation– On this section, a detailed estimation of the transport demand that will be generated by the development during construction and operation phases was undertaken. The morning and evening peak times were addressed, as well as an estimation of the construction traffic relating to the peak construction phase;
3. Assessment of the Cumulative Traffic Impact – An assessment was undertaken to establish the impact of the proposed 110kV Transmission Line in the form of proportional percentage traffic increase through relevant junctions during the operational and construction phases.
4. The worst case construction traffic impact is also discussed for the peak construction traffic movements; and
5. Mitigation measures are then proposed to offset any impacts that may result from the develpment.

Local Road Network

Grange Castle Business Park Access Road

12.8 Grange Castle Business Park Access Road is a two-way local road. It accommodates 1 no. lanes in each direction and an east-west alignment serving the properties within Grange Castle Business Park. This road's carriageway measures ca. 7.5 metres wide, with footpaths and cycle lanes provided on both sides of the road. A 50 km/h speed limit is currently in operation.

L2001 Baldonnel Road

12.9 L2001 Baldonnel Road is a two-way local road. This road's carriageway measures ca. 6.0 metres wide, and it accommodates 1 no. lanes on each direction. It extends for approximately 4.0 km connecting the N7 to the southeast with R134 New Nangor Road to the north. A shared footpaths/cycle tracks are provided on each side of the road and a 60 km/h speed limit is currently in operation in the vicinity of the site.

R134 New Nangor Road

12.10 R134 New Nangor Road is a two-way regional road connecting the R120 to the west with the R110 to the east. In the vicinity of the site, it accommodates 1 no. lanes on each direction, with share footpath/cycle track facilities on both sides of the road. A 60 km/h speed limit is currently in operation.

R120 Adamstown Road

12.11 R120 Adamstown Road is a two-way regional road connecting the R120 Peamount Road to the south with the Leixlip Road to the North. In the vicinity of the site, it accommodates 1 no. lanes on each direction, with share footpath/cycle track facilities on both sides of the road. A 60 km/h speed limit is currently in operation.

Existing Traffic Volumes

Data Collection

12.12 Classified Junction turning counts were undertaken as part of the Traffic Impact Assessment (TIA) undertaken for permitted data centre development under planning registry *SDCC Planning Reg. Ref. SD20A/0121*. The surveys were carried out on Tuesday 17th December 2019 over a period of 12-hours (07:00-19:00hrs). The surveys were undertaken by Irish Traffic Surveys (ITS), on behalf of CS Consulting. Figure 12.2 below, illustrates the location of the surveyed junctions in relation to the site.

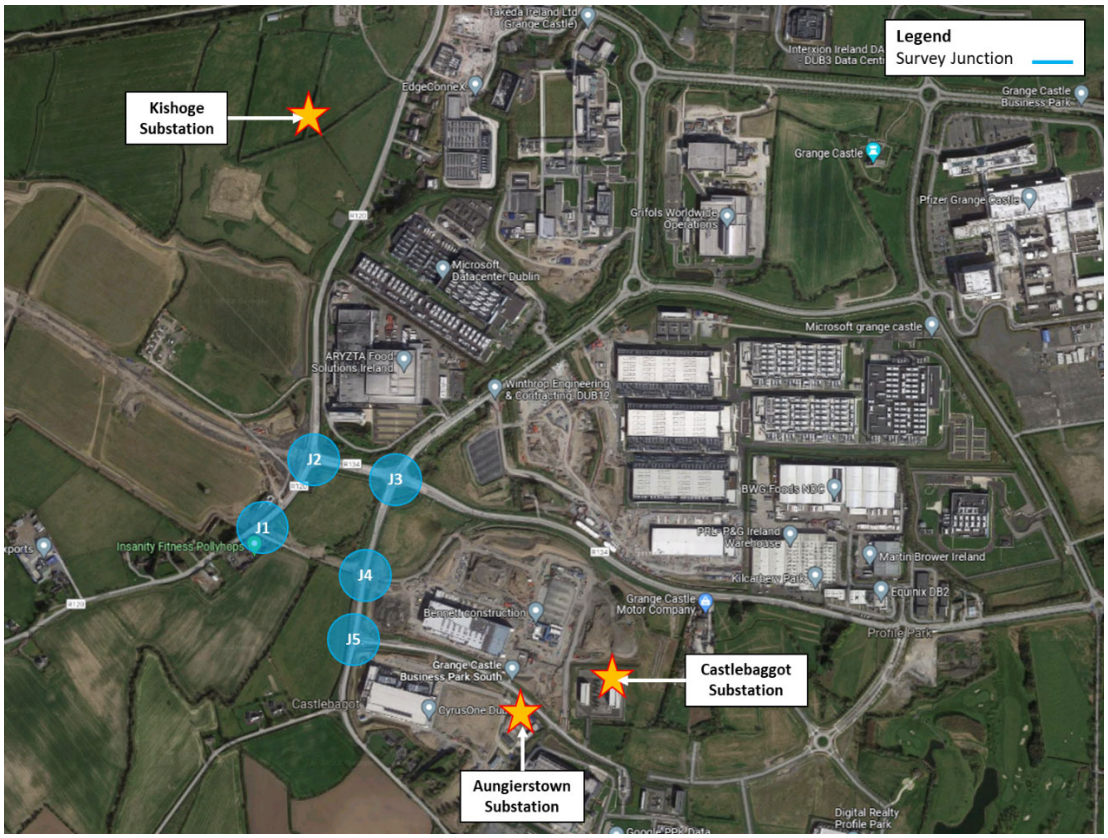


Figure 12.2: Traffic Survey Locations

12.13 As shown on Figure 12.4 above, the surveys were undertaken at the following junction:

- J1: Adamstown Road (R120) / Old Nangor Road / Peamount Road (R120) (former 3-arm priority-controlled junction; now cul de sac access only)
- J2: 3-arm Adamstown Road (R120) / R134 New Nangor Road signal-controlled junction
- J3: 3-arm R134 New Nangor Road / Baldonnel Road (L2001) signal-controlled junction
- J4: Baldonnel Road (L2001) / Old Nangor Road (former 4-arm priority-controlled junction; now defunct)
- J5: 3-arm Baldonnel Road (L2001) / Grange Castle Business Park South priority-controlled junction

12.14 Junction 1 and Junction 4 have not been taken into consideration in the traffic impact assessment for development, as they are no longer active.

Survey Results

12.15 Following the analysis of the surveys, network peak hours were determined to occur between 07:30-08:29hrs for the AM peak, and 16:30-17:29hrs for the PM peak. Table 12.1 below, summaries the total flows recorded to transit through the junctions during the critical periods described above. Traffic figures presented in the following table are in Passenger Car Units (PCUs) with the following factors assumed: medium goods vehicles 1.5, bus 2.0, and HGV 2.3. Source: TII, Project Appraisal Guidelines for National Roads Unit 5.2 (October 2016).

Time Period	Total Junction Traffic Movements (PCUs)		
	J2	J3	J5
AM Peak (07:30-08:29hrs)	1,630	1,606	791
PM Peak (16:30-17:29hrs)	1,574	1,353	701

Table 12.1: *Traffic Survey Results; Source: TIA for Proposed Datacentre SDCC Planning Reg. Ref. SD20A/0121, CS Consulting Group, 2020.*

Proposed 110kV Transmission Line Traffic Generation

Operational Phase

12.16 The 110kV transmission line does not require any full-time staff to operate it on a daily basis. However, maintenance works will take place annually. This will require up to 4 ESB staff to conduct testing over a period of 15 days (120 hours). This represents the worst-case scenario for traffic generation related to the proposal during the operational phase. Table 12.2 below sets out the estimated traffic

generation during the worst-case scenario. For the purpose of this assessment, it has been assumed that 50% of the traffic will arrive and depart during critical time periods.

Time Period	Arrivals		Departures		Total PCUs[1]
	LV	HV	LV	HV	
AM Peak (07:30-08:29)	2	0	0	0	2
PM Peak (16:30-17:29)	0	0	2	0	2
Total 12-hours	**4**	**0**	**4**	**0**	**8**

Table 12.2: *110kV Transmission Line Traffic Generation - Operational Phase*

12.17 As seen in Table 12.2, up to 2 no. vehicles trips are estimated to be generated by the proposal on critical time periods. These number of vehicles movements shall be expected only during the worst-case scenario which shall happen once per year.

Construction Phase

12.18 In general, the impact of the construction period would be short-term in nature. Subject to grant of planning permission for the reconfigured Kishoge gridline, construction work is anticipated to commence in Q3 2023 with approximately 12 months for both the construction phase and commissioning phase prior to commencement of full operations.

12.19 The off-road section of the proposal will be installed between the hours of 8am and 6pm. During installation, staff will arrive on site at approximately 7:00 am and take circa 1 hour to mobilise before commencing works.

12.20 The on-road section of the route involves the crossing of the Baldonnell Road and the R120 with a small section beneath an Old Nangor Roadway (not active) adjacent to the R120. Traffic management measures will be put in place such that one lane will remain open during this element of work. If relevant all works requiring the closure of one or more traffic lanes will be carried out at night, between the hours of 7:00 pm and 6:00 am. These works will be completed under a T2 road opening licence application, which will be provided by South Dublin County Council. The works will be completed in accordance with the issued road opening licence/s.

12.21 In general, the civil works element of work will require a higher number of staff and construction vehicles compared to the cable installation, jointing and testing. The following construction data has been used to estimate peak daily construction traffic:

- Average construction staff: 10-16;

[1] *PCU Factors: medium goods vehicles 1.5, bus 2.0, and HGV 2.3. Source: TII, Project Appraisal Guidelines for National Roads Unit 5.2 (October 2016).*

- Peak construction staff (peak staff levels during Civil Works): 30;
- Peak HGVs (HV) entering/exiting site per day: 10;

Construction Schedule

12.22 A summary of the proposed target dates (earliest possible dates) for the proposed development are as follows:

- Application for Planning Permission – September 2022
- Commence Site Construction works (subject to grant of planning permission) – Q3 2023
- Completion of Construction – Q2 2024
- Complete Commissioning Works– Q3 2024

12.23 A construction compound at the Edgeconnex site at Ballymakaily West of Newcastle Road (R120), Lucan, Co. Dublin will facilitate an office, portable sanitary facilities, equipment storage, parking etc. for contractors. It will be used for the duration of the works.

12.24 Table 12.3 (overleaf) sets out the estimate traffic generation associated with the proposed 110kV Transmission Line during the construction phase. For the purpose of this assessment, it has been assumed that 50% of the LV traffic will arrive and depart from the site during critical time periods, and up to 2 no. HGV vehicles will access/egress the site every hour.

Time Period	Arrivals		Departures		Total PCUs[2]
	LV	HV	LV	HV	
AM Peak (07:30-08:29)	15	2	0	2	24
PM Peak (16:30-17:29)	0	2	15	2	24
Total 12-hours	**30**	**10**	**30**	**10**	**106**

Table 12.3: *110kV Transmission Line Traffic Generation - Construction Phase (Peak Construction Phase)*

12.25 As shown on Table 12.3, during the peak construction stage, a total of 24 no. PCUs trips associated with the proposal are expected to occur during both critical periods. HGV trips are expected to arrive and leave during the same hour.

Traffic Modal Split

12.26 For the purpose of this report, a worst-case scenario has been assumed for traffic generation by assuming all trips to the site are by private car or HGV.

Traffic Distribution

[2] *PCU Factors: medium goods vehicles 1.5, bus 2.0, and HGV 2.3. Source: TII, Project Appraisal Guidelines for National Roads Unit 5.2 (October 2016).*

12.27 For the purpose of this assessment, it has been assumed that all construction traffic associated with the proposal will access via the N7/ R136/R134 and the N4/ R120, with 50% accessing from the north and 50% accessing from the south. On the other hand, due to the low volume of operational traffic estimated for the proposal, traffic generation for this phase has been assumed to access the site via the R134 New Nangor Road and R136.

Traffic Impact Analysis - Operational Phase

Assessment Years and Time Period

12.28 In order to establish the traffic impact of the development proposal on the local road network, it is first necessary to understand the without development or 'do-nothing' scenario. As recommended by *TII's TTA Guidelines*, three assessment years are considered, namely: base year (2019), year of opening (YoO) which is assumed to be 2024; and a horizon year (YoO+15), i.e., 2039. The assessment will focus on assessing the proposed 110kV Transmission Line traffic impact during the critical time periods for the local road network, i.e., the AM peak hour (07:30-08:29hrs) and the PM peak hour (16:30-17:29hrs).

Assessment Scenarios

12.29 The following scenarios have been developed in assessing the proposed development's traffic impacts:

- **Do-Nothing Scenario**: To assess the traffic impact of the development proposals on the local road network, first, the background traffic conditions without the proposed development, also referred to as the 'do-nothing' scenario, were established. Such background traffic flows have been determined from the traffic survey detailed in preceding sections of this Report. This scenario includes the traffic associated with committed developments in the local area.
- **Do-Something Scenario:** The with-development or 'do-something' scenario represents traffic conditions following completion of the proposed 110kv Transmission Line, i.e., do-nothing plus additional traffic generated by the proposal.

Background Traffic Growth Forecasting

12.30 Existing traffic flows on the surrounding road network, have been adjusted through application of appropriate growth factors to determine YoO (2024) and YoO+15 (2039) traffic flows. For this assessment, growth factors were determined from the Transport Infrastructure Ireland (TII) Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, May 2019. Information within these guidelines is provided for Dublin Metropolitan Area from 2016-2030 and from 2030-2040 for low, central, and high sensitivity growth scenarios. Central growth factors were assumed

for this assessment to determine future year background traffic flows on the surrounding road network. These factors are set out in Table 12.4, which follows.

Years	Annual Growth Factor - LV	Annual Growth Factor – HV
2016-2030	1.0837	1.1565
2030-2040	1.2493	1.5549

Table 12.4: *TII Growth Factors – Central- Dublin Metropolitan Area*

12.31 The TII central growth factors in the preceding Table 12.4, has been used to provides an overview of background traffic (PCUs) predicted at the relevant junctions for the YoO and YoO+15 for the identified AM and PM peak hours. The results of this analysis are presented in the following Table 12.5.

Junction No.	Time Period	Total Forecasted Junction Traffic Movements (PCUs)		
		Base Year*	YoO	YoO+15
		2019	2024	2039
J2	**AM Peak**	1,630	1,775	2,077
	PM Peak	1,574	1,714	2,015
J3	**AM Peak**	1,606	1,747	2,044
	PM Peak	1,353	1,473	1,727
J5	**AM Peak**	791	865	1016
	PM Peak	701	762	895

Table 12.5: *Existing and Forecast Background Approach Flow Traffic at Relevant Junction. *As per Table 12.1*

Committed Developments

12.32 The developments considered in Table 2.1 and associated with the following planning applications have been taken into consideration for the assessment as they are proposals in the local area with approved planning permission that were not in place at the time of the traffic survey:

- SD18A/0134
- SD19A/0300
- SD20A/0121
- *SD19A/0042 (Amendment SD22A/0105)*
- *SD21A/0042 (Amendment to condition 3(ii) and (iii): SD22A/0289)*

12.33 These developments are located within the Grange Castle Business Park and the Ballymakaily, West of Newcastle Road (R120) site. The traffic associated with these developments, during the operational phase have been obtained from the traffic impact undertaken as part of their assessment and is summaries in table 12.6, which follows.

Time Period	Arrivals	Departures	Total PCUs
	LV	LV	
AM Peak (07:30-08:29)	202	95	297
PM Peak (16:30-17:29)	40	148	188

Table 12.6: *Committed Development Traffic*

Do-Nothing Traffic Flows

12.34 The traffic presented in Table 12.6, has been added to the forecasted background traffic set out in table 12.5 to obtain the do-nothing traffic flows, with results presented in the following table 12.7. For the purpose of this analysis, it has been assumed that will 50% of the traffic will access the developments via the N7/ R136/R134 (east-south) and the remaining 50% will access via N4/ R120 (north).

Junction No.	Time Period	Total Forecasted Junction Traffic Movements (PCUs)		
		Base Year* 2019	YoO 2024	YoO+15 2039
J2	**AM Peak**	1,630	1,923	2,226
	PM Peak	1,574	1,808	2,109
J3	**AM Peak**	1,606	1,976	2,273
	PM Peak	1,353	1,633	1,888
J5	**AM Peak**	791	1,025	1,176
	PM Peak	701	895	1,028

Table 12.7: *Do-Nothing Traffic*

Do-Something Traffic Flows

12.35 The trip generation estimated for the proposal during the operational phase (see Table 12.2) has been added to the traffic presented above to obtain the do-something traffic volumes at relevant junctions. With the assumption that all vehicles access via R134 New Nagor Road and visit all substations, the do-something traffic is presented in the following Table 12.8.

Junction No.	Time Period	Total Forecasted Junction Traffic Movements (PCUs)	
		YoO 2024	YoO+15 2039
J2	**AM Peak**	1,925	2,228
	PM Peak	1,810	2,111
J3	**AM Peak**	1,978	2,275
	PM Peak	1,635	1,890
J5	**AM Peak**	1,027	1,178
	PM Peak	897	1,030

Table 12.8: *Do-Something Traffic*

12.36 Due to the low number of vehicles trip generation associated with proposed 110kV transmission line, the traffic flows through the junctions shall remain similar as existing conditions.

Percentage Increase

12.37 The percentage traffic increase at the relevant junction is presented in the following Table 12.9

Junction No.	Time Period	YoO 2024	YoO+15 2039
J2	AM Peak	+0.10%	+0.09%
	PM Peak	+0.11%	+0.09%
J3	AM Peak	+0.10%	+0.09%
	PM Peak	+0.12%	+0.11%
J5	AM Peak	+0.20%	+0.17%
	PM Peak	+0.22%	+0.19%

Table 12.9: *Traffic Percentage Increase*

12.38 As shown above, the percentage increase in traffic through the junctions is below 0.5%. This demonstrates that the traffic impact in the operational phase of the proposed development is **long-term**, **neutral** and **imperceptible**. The likely proportional traffic increase through the relevant junctions with the proposal in place are significantly below the thresholds stated in the *TII Guidelines for Traffic and Transport Assessments, 2014* for junction analysis.

Traffic Impact Analysis - Construction Phase

12.39 The impacts of the traffic associated with the construction of the proposed 110kV Transmission Line are minimum. Given the short-term nature of the peak construction phase, the overall impact of the construction phase involving the proposal is considered not significant and shall not affect the performance of the surrounding road network

REMEDIAL AND MITIGATION MEASURES

Construction Phase

12.40 The following measures will be put in place during the construction works to ensure the effective traffic management during this period:

- 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 Edgeconnex site at Ballymakaily West of Newcastle Road (R120) 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. Construction traffic will minimise movements during peak hours.

- Construction traffic routes shall be use strategically by construction vehicles to minimise traffic impact to surrounding properties.

Operational Phase

12.41 The potential traffic impact associated with the proposal was found to be **long-term, neutral** and **imperceptible**. The traffic impact estimated for this are significantly below the thresholds stated in the TII Guidelines for Traffic and Transport Assessments, 2014 for junction analysis. Therefore, no junction modifications are recommended on the public road to facilitate the Proposed Development.

Predicted Impacts of The Development

12.42 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.

Cumulative Impact

12.43 In addition to the committed developments' traffic presented in Table 12.6, it has been deemed relevant to the assessment to consider the traffic associated with 2 no. datacentre facilities to be delivered in the near future adjacent to DUB 4 and DUB 5 (Kishoge substation site). The planning application for these buildings is yet to be lodged. Subject to planning, the construction of these facilities is planned to start in Q4 2023.

12.44 The estimated traffic generation for these datacentres is presented in Table 12.10, which follows.

Time Period	Arrivals	Departures	Total PCUs
	LV	LV	
AM Peak (07:30-08:29)	40	20	60
PM Peak (16:30-17:29)	0	0	0

Table 12.10 *DUB6 Estimated Traffic Generation*

12.45 Due to the estimated shift patterns of the site, the AM Peak hour will have 40 arrivals and 20 departures resulting in a total of 60 two-way trips. The shift change occurs at 16:00 which would be outside the PM Peak. It is therefore assumed that the development will have no impact on the PM Peak.

12.46 For the purposed for this assessment, it has been assumed 50% of the traffic will access from the north (via the N4) and 50% will access from the south (via New Nangor Road).

12.47 50% the traffic presented above has been added to the do-something traffic volumes (included in Table 12.7) transiting through junctions 2 and 3, setting out the total vehicle movements estimated to transit through these junctions. This is presented in Table 12.11 which includes all background traffic, committed developments, Kishoge Gridline (proposed development), and the abovementioned datacentre buildings.

Junction No.	Time Period	YoO	YoO+15
		2024	2039
J2	AM Peak	1,955	2,258
J3	AM Peak	2,008	2,305

Table 12.11 *Estimated Traffic Including DUB6 Trips Generation*

12.48 The traffic percentage increase through junctions 2 and 3 as result of the proposed development (Kilshone Gridline) and the data centres (Dub6) is presented in Table 12.12.

Junction No.	Time Period	YoO	YoO+15
		2024	2039
J2	AM Peak	1.7%	1.4%
J3	AM Peak	1.6%	1.4%

Table 12.12 *Estimated Traffic Percentage Increase Including DUB6 Trips Generation*

12.49 The assessment undertaken has taken in consideration the traffic associated with all major schemes to be delivered in the vicinity of the site. The potential cumulative traffic impact associated with the development will be ***long-term, neutral,*** and ***imperceptible****.*

Residual Impacts

12.50 The residual traffic impacts of the development will be **neutral** and **imperceptible**.

Parking

Car Parking Provision

12.51 No Car/ Cycle parking is deemed necessary for the operational phase of the proposal. Vehicles utilised by staff undertaking the yearly inspection will utilise the car parking facilities available at the relevant substations.

Environmental Impact

12.52 As stated above, the proposed development will not generate a significant volume of additional vehicular traffic during construction or operational phases. The level of traffic increase is not likely to have any adverse transport-related environmental effects in terms of noise, air quality, vibrations, etc. The impact of the construction period will be short-term and not significant in nature.

REFERENCES

- *South Dublin Development Plan 2016-2022*, South Dublin County Council;
- *South Dublin Development Plan 2022-2028*, South Dublin County Council;
- *TII Traffic and Transport Assessment Guidelines PE-PDV-02045 (May 2014),* Transport Infrastructure Ireland;
- *TII Project Appraisal Guidelines – Unit 5.3: Travel Demand Projections, (2016)* Transport Infrastructure Ireland;
- *Traffic Impact Assessment for Proposed Data Centres at Grange Castle Business Park (2020) SDCC Planning Reg. Ref. SD20A/0121*, CS consulting Group, Job No. A093;
- *Traffic and Transport Chapter of EIAR for Proposed Data Centres at Grange Castle Business Park (2018), SDCC Planning Reg. Ref. SD18A/0134,* Marston Planning Consultancy.
- *Traffic and Transport Chapter of EIAR for Proposed Data Centres at Grange Castle Business Park (2019), SDCC Planning Reg. Ref. SD21A/0042 (Amendment to Condition nos. 3(ii) and (iii) in Reg. Ref.: SD22A/0289),* Marston Planning Consultancy.
- *Traffic and Transport Chapter of EIAR for Proposed Data Centres at Grange Castle Business Park (2019), SDCC Planning Reg. Ref. SD19A/0042 (amended under Reg. Ref.: SD22A/0105),* Marston Planning Consultancy.
- *Transport Statement of EDCDUB065 (July 2022), prepared for Edge Connex,* Pinnacle Consulting Engineers.
- *Outline Construction Traffic Management Plan of EDCDUB06 (July 2022), prepared for Edge Connex,* Pinnacle Consulting Engineers.

13.0 WASTE MANAGEMENT

13.1 INTRODUCTION

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 EIA Report Guidelines 2022 and EPA Draft Advice Notes for EIS 2015.

This chapter has also been prepared to address the issues associated with material assets during the construction and operational phases of the proposed development as described in Chapter 2.

A site-specific Construction and Demolition Resource Waste Management Plan (C&D RWMP) has been prepared by AWN Consulting Ltd to deal with waste generation during the demolition, excavation and construction phases of the proposed Development and has been included as Appendix 13.1. The C&D RWMP was 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 (DoEHLG) in July 2006 and the Environmental Protection Agency's (EPA) document 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021).

The Chapter has been prepared in accordance with European Commissions Guidelines, Guidance on the preparation of the Environmental Impact Assessment Report (2017), the EPA Guidelines on the Information to be contained in EIAR (2022) and the EU Commission Notice on changes and extensions to projects, 2021..

The C&D RWMP along with the mitigation measures will ensure the sustainable management of wastes arising at the Development Site in accordance with legislative requirements and best practice standards.

13.2 METHODOLOGY

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, 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 the C&D RWMP provided in Appendix 13.1.

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 demolition, site preparation and excavation);
- Operational phase; and
- Decommissioning Phase

A desktop study was carried out which included the following:

- 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.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research as well as other available research sources.

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 Section 13.6

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 5 of this EIAR (Land, Soils, Geology and Hydrogeology).

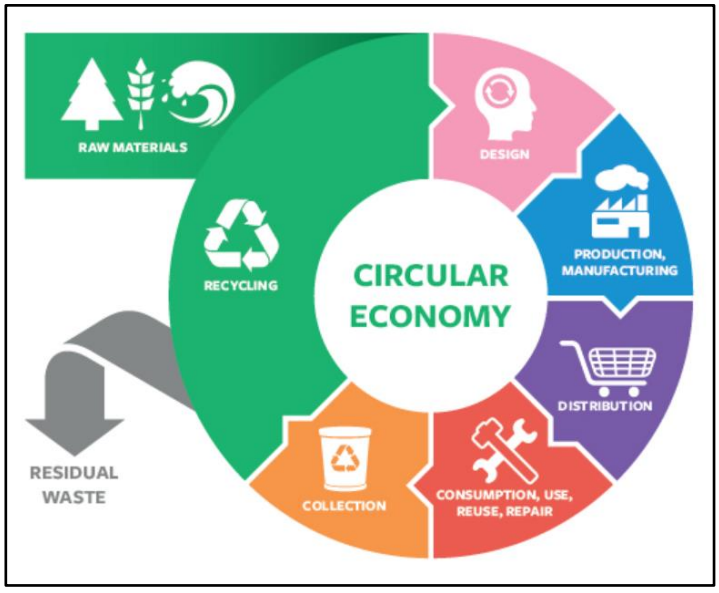
13.2.1 Legislation and Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation and control, 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). European and national waste management policy is based on the concept of ‘waste hierarchy’, which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (Figure 16.1).

Figure 16.1: Waste Hierarchy (Source: European Commission)

EU and Irish National waste policy also aims to contribute to the circular economy by extracting high-quality resources from waste as much as possible. Circular Economy (CE) is a sustainable alternative to the traditional linear (take-make-dispose) economic model, reducing waste to a minimum by reusing, repairing, refurbishing and recycling existing materials and products. (Figure 16.2).

Figure 16.2: Circular Economy (Source: Repak)



The Irish government issues policy documents which outline measures 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, Waste Action Plan for a Circular Economy – *Waste Management Policy in Ireland, was published in 2020* and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the

Irish and international waste context changing in the years since the launch of the previous waste management plan*, A Resource Opportunity, in 2012.*

One of the first actions to be taken from the WAPCE was the development of the Whole of Government Circular Economy Strategy 2022-2023 'Living More, using Less' (2021) to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021.

The strategy for the management of waste from the construction phase is in line with the requirements of the EPA's 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021). The guidance documents, Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects and Construction and Demolition Waste Management: A Handbook for Contractors and Site Managers (FÁS & Construction Industry Federation, 2002), were also consulted in the preparation of this assessment.

There are currently no Irish guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including the Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021, BS 5906:2005 Waste Management in Buildings – Code of Practice, the South Dublin County Council (SDCC) Waste Management (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws 2018, the EPA National Waste Database Reports 1998 – 2019 and the EPA National Waste Statistics Web Resource.

13.2.2 Terminology

Note that the terminology used herein is generally consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

Waste - Any substance or object which the holder discards or intends or is required to discard.

Prevention - Measures taken before a substance, material or product has become waste, that reduce:

a) the quantity of waste, including through the re-use of products or the extension of the life span of products;
b) the adverse impacts of the generated waste on the environment and human health; or
c) the content of harmful substances in materials and products.

Reuse - Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

Preparing for Reuse - Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

Treatment - Recovery or disposal operations, including preparation prior to recovery or disposal.

Recovery - Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the

wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.

Recycling - Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Disposal - Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I of the Waste Framework Directive sets out a non-exhaustive list of disposal operations.

13.3 RECEIVING ENVIRONMENT

In terms of waste management, the receiving environment is largely defined by South Dublin County Council 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 and the Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland.

The waste management plans set out 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 55% of managed municipal waste by 2025; 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.

The 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.

Ireland achieved 84 per cent material recovery of such waste in 2019, and therefore surpassed the 2020 target and is currently surpassing the 2025 target. The National Waste Statistics update published by the EPA in November 2021 identifies that Ireland’s current 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)” was met for 2020 at 51% however they are currently not in line with the 2025 target (55%).

The *South Dublin County Development Plan 2022 – 2028* sets out policies and objectives for the SDCC area, which reflect those set out in the regional waste management plan.

In terms of physical waste infrastructure, SDCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the EMR for management of waste from the construction industry, as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and two waste-to-energy facilities.

13.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed 110kV underground transmission line connections will originate from the Kishoge 110kV GIS substation. The substation was permitted as part of the development under Reg. Ref.: SD19A/0042 and ABP Ref.: 305948-19, as amended under Reg. Ref.: SD22A/0105. The proposed 110kV underground transmission line connections extend northwards from the Kishoge 110kV substation, before proceeding to the east and then to the south, along the periphery of the lands in the ownership of the applicant, and continuing alongside the R120 before continuing to the south and crossing the R134 New Nangor Road. The route then proceeds further southward and to the southeast to cross the R120, continues to the south and then to the east (adjacent to the Old Nangor Road), crossing the Griffeen River and proceeding eastwards and then south before crossing the Baldonnel Road and proceeding eastward within lands to the south of the Grange Castle South Business Park access road, before reaching and connecting to the Aungierstown – Castlebaggot underground transmission line. The Kishoge to Aungierstown transmission line circuit will include 4 no. joint bays, while the Kishoge to Castlebaggot transmission line circuit will include 5 no. joint bays. The proposed 110kV underground transmission line connections will cover a distance of c. 2.2 kilometres.

The development includes enabling works, services diversions, joint bays, connections to the Kishoge substation and the Aungierstgown – Castlebaggot transmission line, provision of a medium voltage electricity connection to serve the Kishoge substation from an existing ESB substation to the east of the R120, landscaping, services, all associated construction works, and all ancillary works.

A full description of the proposed development can be found in Chapter 2 (Description of the Proposed Development). The characteristics of the proposed development that are relevant in terms of waste management are summarised below.

13.4.1 Demolition Phase

There will be no demolition required as part of this development.

13.4.2 Construction Phase

During the construction phase there may be a surplus of building materials generated from the installation of the transmission line, such as timber off-cuts, plastics, metals and waste from contractors. Plastic and cardboard waste from packaging and supply of materials will also be generated. The contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

There will be soil, stones, gravel, clay and made ground excavated to facilitate construction of new foundations, underground services, and the installation of the proposed basements. The development engineers (Clifton Scannell Emerson Associates Consulting Engineers) have estimated that 7,000 m^3 of material will need to be excavated and will need to be removed offsite due to the limited opportunities for reuse on site. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

If the material that requires removal from the site 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 for the receiving facility. Alternatively, the material may be classed as by-product under Article 27 classification (European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011). For more information in relation to the envisaged management of by-products, refer to the C&D RWMP (Appendix 13.1).

Site investigations (SI) and environmental soil testing will be undertaken prior to the removal of any material from the site. Due to the nature of the project and the long distance that it covers, it is not currently possible to undertake SI investigations without causing disruptions.

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones to be removed off-site, it will first need to be classified. Waste 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* (2019). Environmental soil analysis will be carried out prior to removal of the material on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste, including potential pollutant concentrations and leachability. It is anticipated that the surplus material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities / landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment / recovery or exported abroad for disposal in suitable facilities.

Waste will also be generated from construction phase workers e.g. 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 on-site during the Construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific C&D RWMP (Appendix 13.1). The C&D RWMP provides an estimate of the main waste types likely to be generated during the Construction phase of the proposed development. These are summarised in Table 13.1.

***Table 13.1**: Predicted on and off-site reuse, recycle and disposal rates for construction waste*

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	0.98	10	0.10	80	0.79	10	0.10
Timber	0.83	40	0.33	55	0.46	5	0.04
Metals	0.24	5	0.01	90	0.21	5	0.01
Concrete	0.18	30	0.05	65	0.12	5	0.01
Other	0.45	20	0.09	60	0.27	20	0.09
Total	**2.68**		**0.59**		**1.84**		**0.25**

13.4.3 Operational Phase

There will be no operational waste generated during the operational stage of this development.

13.4.4 Decommissioning Phase

The Proposed Development may be decommissioned at some stage in the future. At that time, a demolition or refurbishment plan will be formulated for the decommissioning phase of the Proposed Development to ensure no waste nuisance occurs at nearby sensitive receptors.

13.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

This section details the potential waste effects associated with the proposed development.

13.5.1 Construction Phase

The proposed Development will generate a range of non-hazardous and hazardous waste materials during site demolition, excavation and construction. General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the Development Site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be ***short-term, significant*** and ***negative***.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including 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. In the absence of mitigation, the effect on the local and regional environment is likely to be ***Long-term, significant*** and ***negative***.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the EMR which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the Development Site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be ***short-term, significant*** and ***negative***.

There is a quantity of excavated material which will need to be excavated to facilitate the proposed Development. A detailed review of the existing ground conditions on a

regional, local site-specific scale are presented in Chapter 6. It is anticipated that c. 7,000 m^3 of excavated material will need to be removed off-site. 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 workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect on the local and regional environment is likely to be ***short-term, significant*** and ***negative***.

13.5.2 Operational Phase

There will be no impacts from the operational phase of this development.

13.5.3 Decommissioning Phase

The greatest potential impact on waste during the decommissioning phase of the Proposed Development would be if the transmission line was to be excavated and removed.

The decommissioning of the proposed development will generate a range of non-hazardous waste materials during site demolition. General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, *short-term, significant*** and ***negative***.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with the European Union, regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, *long-term, significant*** and ***negative***.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the EMR which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the development site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region and within Ireland. The majority of the materials used in this project will be either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, *short-term, significant*** and ***negative***.

13.5.4 Do Nothing Scenario

If the proposed development was not to go ahead (i.e. in the Do-Nothing scenario) there would be no demolition, excavation or construction or operational waste generated at this Site. There would, therefore, be a neutral effect on the environment in terms of waste.

13.6 REMEDIAL AND MITIGATION MEASURES

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.

13.6.1 Construction Phase

The following mitigation measures will be implemented during the construction phase of the proposed development:

As previously stated, a project specific C&D RWMP has been prepared in line with the requirements of the requirements of the Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects (DoEHLG, 2006) and The EPA, Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021) and is included as Appendix 13.1. The mitigation measures outlined in the C&D RWMP will be implemented in full and form part of mitigation strategy for the site. The mitigation measures presented in this C&D RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the C&D RWMP (Appendix 13.1) in agreement with SDCC in conjunction with planning condiitons, or submit an addendum to the C&D RWMP to SDCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will be required to fully implement the C&D RWMP throughout the duration of the proposed excavation and construction phases.

A quantity of topsoil and sub soil will need to be excavated to facilitate the proposed development. The Project Engineers have estimated that 7,000m^3 of excavated material will need to be removed off-site. 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 workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
    - Concrete rubble;
    - Metals; and
    - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- 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(s) 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 suitably 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.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. 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). EPA approval will be obtained prior to moving material as a by-product.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and 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 and will promote more sustainable consumption of resources.

13.6.2 Operational Phase

There will be no mitigation measures required from the operational phase of this development as no operational waste will be generated.

13.6.3 Decommissioning Phase

The following mitigation measures will be implemented during the decommissioning of the proposed development:

- Prior to commencement, the appointed Contractor(s) will be required to prepare a Demolition Waste Management Plan (DWMP) in agreement with SDCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will be required to fully implement the DWMP throughout the duration of the decommissioning.

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. The following waste types, at a minimum, will be segregated:
    - Concrete rubble (including ceramics, tiles and bricks)
    - Cable; and
    - plastic.
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;

- 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(s) to ensure effective management of waste during the demolition / refurbishment 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 suitably permitted contractors and taken to suitably registered, permitted or licenced facilities;
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

13.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

13.7.1 Construction Phase

A carefully planned approach to waste management as set out in Section 13.6.1 and adherence to the C&D RWMP (which include mitigation) (Appendix 13.1) during the construction phase will ensure that the predicted effect on the environment will be ***short-term*, *imperceptible* and *neutral*.**

13.7.2 Operational Phase

There will be no residual impacts as there is no operational waste being generated.

13.7.3 Decommissioning Phase

A carefully planned approach to waste management as set out in Section 13.6.3 and adherence to a DWMP during the demolition phase will ensure that the predicted effect on the environment will be ***short-term*, *imperceptible* and *neutral*.**

13.7.4 Conclusion

Assuming the full and proper implementation of the mitigation measures set out herein and, in the C&D RWMP (Appendix 13.1), no likely significant negative effects are predicted to occur as a result of the construction or operational of the proposed development.

13.8 RESIDUAL IMPACTS

The implementation of the mitigation measures outlined in Section 13.6 will ensure that high rates of reuse, recovery and recycling are achieved at the Site of the proposed development during the construction and operational phases. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

13.9 CUMULATIVE IMPACT ASSESSMENT

The following considers the cumulative impacts of the proposed development and proposed and permitted and operating facilities in the surrounding area in relation to

Material Assets – Waste Management. This considers the proposed development and other surrounding proposed and permitted developments considered in Chapter 3.

13.9.1 Construction Phase

Multiple permissions remain in place (see Table 2.1 and Chapter 3 Planning and Development Context and Alternatives list) for comitted developments within the vicinity of the proposed development. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase. Due to the high number of waste contractors in the Dublin and Lienster region there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

Other developments in the area, will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be ***short-term, not significant*** and ***neutral***.

13.9.2 Operational Phase

There will be no operational waste generated as part of this proposed development.

13.10 DO NOTHING SCENARIO

If the development does not proceed no soil will require removal from site.

13.11 MONITORING

No monitoring is required

13.12 DIFFICULTIES ENCOUNTERED IN COMPILING THE CHAPTER

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 proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

There is a number of licensed, permitted and registered waste facilities in the region and in the surrounding counties. However, these sites may not be available for use when required or may be limited by the waste contractor selected to service the development in the appropriate phase. In addition, there is potential for more suitably placed waste facilities or recovery facilities to become operational in the future which may be more beneficial from an environmental perspective.

The ultimate selection of waste contractors and waste facilities would be subject to appropriate selection criteria proximity, competency, capacity, serviceability, and cost.

13.13 REFERENCES

1. Waste Management Act 1996 (No. 10 of 1996) as amended.
2. Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
3. Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
4. Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015).
5. Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998).
6. Forum for the Construction Industry – Recycling of Construction and Demolition Waste.
7. Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020).
8. Department of Environment, Heritage and Local Government, Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (2006).
9. Environmental Protection Agency (EPA) 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (November 2021)
10. FÁS and the Construction Industry Federation (CIF), Construction and Demolition Waste Management – a handbook for Contractors and site Managers (2002).
11. South Dublin County Council (SDCC), South Dublin County Council Development Plan 2022-2028 (2021)
12. SDCC (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws (2018).
13. BS 5906:2005 Waste Management in Buildings – Code of Practice
14. Planning and Development Act 2000 (No. 30 of 2000) as amended
15. Environmental Protection Agency (EPA), Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2015)
16. 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.
17. EPA, *European Waste Catalogue and Hazardous Waste List* (2002)
18. EPA, National Waste Database Reports 1998 – 2018.
19. US EPA, *Characterisation of Building Uses* (1998);
20. EPA and Galway-Mayo Institute of Technology (GMIT), EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned (2015)

APPENDIX 13.1

CONSTRUCTION & DEMOLITION RESOURCE AND WASTE MANAGEMENT PLAN

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CONSTRUCTION & DEMOLITION RESOURCE AND WASTE MANAGEMENT PLAN FOR A PROPOSED UNDERGROUND TRANSMISSION LINE

Report Prepared For

EdgeConnex Ireland Limited

Report Prepared By

Chonaill Bradley, Principal Environmental Consultant

Our Reference

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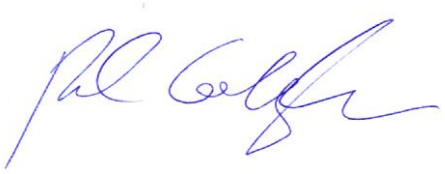
Signature		
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Date	8 August 2022	8 August 2022

Contents Page

1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) has prepared this Construction & Demolition Resource and Waste Management Plan (C&D RWMP) on behalf of EdgeConnex Ireland Limited. The development will principally consist of the provision of underground 110kV transmission line connections between the Kishoge 110kv Gas Insulated switchgear (GIS) substation on a site within the townland of Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin, and the permitted Aungierstown – Castlebaggot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnel, Dublin 22. The proposed transmission lines provide for a loop-in connection to the permitted Aungierstgown – Castlebaggot transmission line.

This plan will provide information necessary to ensure that the management of Construction & Demolition (C&D) waste at the site is undertaken in accordance with the current legal and industry standards including the *Waste Management Acts 1996 - 2011* and associated Regulations [1], *Protection of the Environment Act 2003* as amended [2], *Litter Pollution Act 1997* as amended [3] and the *Eastern-Midlands Region Waste Management Plan 2015 – 2021* [4]. In particular, this Plan aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. It also seeks to provide guidance on the appropriate collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

This C&D RWMP includes information on the legal and policy framework for C&D waste management in Ireland, estimates of the type and quantity of waste to be generated by the proposed development and makes recommendations for management of different waste streams. The C&D RWMP should be viewed as a live document that will be update by the site construction contractor as and when changing site conditions require it to do so.

2.0 C&D RESOURCE & WASTE MANAGEMENT IN IRELAND

2.1 National Level

The Irish Government issued a policy statement in September 1998*, Changing Our Ways*[5], which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within a five year period (by 2003), with a progressive increase to at least 85% over fifteen years (i.e. 2013).

In response to the *Changing Our Ways* report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report entitled '*Recycling of Construction and Demolition Waste'* [6] concerning the development and implementation of a voluntary construction industry programme to meet the Government's objectives for the recovery of C&D waste.

In September 2020, the Irish Government published a new policy document outlining a new action plan for Ireland to cover the period of 2020-2025. This plan *'A Waste Action Plan for a Circular Economy'* [7] (WAPCE), was prepared in response to the 'European Green Deal' which sets a roadmap for a transition to a new economy, where climate and

environmental challenges are turned into opportunities, replacing the previous national waste management plan *"A Resource Opportunity"* (2012).

The WAPCE sets the direction for waste planning and management in Ireland up to 2025. This reorientates policy from a focus on managing waste to a much greater focus on creating circular patterns of production and consumption. Other policy statements of a number of public bodies already acknowledge the circular economy as a national policy priority.

The policy document contains over 200 measures across various waste areas including circular economy, municipal waste, consumer protection and citizen engagement, plastics and packaging, construction and demolition, textiles, green public procurement and waste enforcement.

One of the first actions to be taken was the development of the Whole of Government Circular Economy Strategy 2022-2023 'Living More, using Less' (2021) [8] to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021. It is anticipated that the Strategy will be updated in full every 18 months to 2 years.

The Environmental Protection Agency (EPA) of Ireland issued '*Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects' in November 2021* [9]. These guidelines replace the previous 2006 guidelines issued by The National Construction and Demolition Waste Council (NCDWC) and the Department of the Environment, Heritage and Local Government (DoEHLG) in 2006 [10]. The guidelines provide a practical approach which is informed by best practice in the prevention and management of C&D wastes and resources from design to construction of a project, including consideration of the deconstruction of a project. These guidelines have been followed in the preparation of this document and include the following elements:

- Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes;
- Design teams roles and approach;
- Relevant EU, national and local waste policy, legislation and guidelines;
- Waste disposal/recycling of C&D wastes at the site;
- Provision of training for Resource Waste Manager (RWM) and site crew;
- Details of proposed record keeping system;
- Details of waste audit procedures and plan; and
- Details of consultation with relevant bodies i.e. waste recycling companies, Local Authority, etc.

Section 3 of the Guidelines identifies thresholds above which there is a requirement for the preparation of a C&D Waste Management Plan for developments. The new guidance Classifies developments on a two Tiers based system. Below the following thresholds may be classed as Tier 1 development and above a Tier 2:

- New residential development of less than 10 dwellings.
- Retrofit of 20 dwellings or less.

- New commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 1,250m^2.
- Retrofit of commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 2,000m^2; and
- Demolition projects generating in total less than 100m^3 in volume of C&D waste.

Developments above these thresholds are classed as Tier-2 projects

This development requires a C&D RWMP as a Tier 1 development as none of the above Tier 2 criterion apply.

Other guidelines followed in the preparation of this report include *'Construction and Demolition Waste Management – a handbook for Contractors and Site Managers'* [9] , published by FÁS and the Construction Industry Federation in 2002 and the previous guildines 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' (2006).

These guidance documents are considered to define best practice for C&D projects in Ireland and describe how C&D projects are to be undertaken such that environmental impacts and risks are minimised and maximum levels of waste recycling are achieved.

2.2 Regional Level

The proposed development is located in the Local Authority area of South Dublin County Council (SDCC).

The *EMR Waste Management Plan 2015 – 2021* is the regional waste management plan for the SDCC area published in May 2015. Currently the EMR and other regional waste management plans are under review and the Regional Waste Management Planning Offices expect to publish the final plan in early 2022.

The regional plan sets out the following strategic 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.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €130 - €150 per tonne of waste which includes a €75 per tonne landfill levy specified in the *Waste Management (Landfill Levy) Regulations 2015.*

The *South Dublin County Development Plan 2022 – 2028* [12] will supersede the current development plan and is due to be complete and come into effect in August 2022. The following policy and objectives have thus far been incorporated into the draft plan:

Policy and Objectives

Policy IE6: Waste Management

Implement European Union, National and Regional waste and related environmental policy, legislation, guidance and codes of practice to improve management of material resources and wastes.

- **IE6 Objective 1**
  To encourage a just transition from a waste management economy to a green circular economy to enhance employment and increase the value, recovery and recirculation of resources through compliance with the provisions of the Waste Action Plan for a Circular Economy 2020 – 2025 and to promote the use of, but not limited to, reverse vending machines and deposit return schemes or similar to ensure a wider and varying ways of recycling.
- **IE6 Objective 2**
  To support the implementation of the Eastern Midlands Region Waste Management Plan 2015-2021 or as amended by adhering to overarching performance targets, policies and policy actions.
- **IE6 Objective 4**
  To provide for and maintain the network of bring infrastructure (e.g. civic amenity facilities, bring banks) in the County to facilitate the recycling and recovery of hazardous and non-hazardous municipal wastes.
- **IE6 Objective 7**
  To require the appropriate provision for the sustainable management of waste within all developments, ensuring it is suitably designed into the development, including the provision of facilities for the storage, separation and collection of such waste.
- **IE6 Objective 8**
  To adhere to the recommendations of the National Hazardous Waste Management Plan 2014-2020 and any subsequent plan, and to co-operate with other agencies including the EPA in the planning, organisation and supervision of the disposal of hazardous waste streams, including hazardous waste identified during construction and demolition projects.

2.3 Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the development are:

- Waste Management Act 1996 (No. 10 of 1996) as amended.
- Environmental Protection Act 1992 (No. 7 of 1992) as amended.
- Litter Pollution Act 1997 (No. 12 of 1997) as amended.
- Planning and Development Act 2000 (No. 30 of 2000) as amended [12.]

One of the guiding principles of European waste legislation, which has in turn been incorporated into the *Waste Management Act 1996 - 2001* and subsequent Irish legislation, is the principle of *"Duty of Care"*. This implies that the waste producer is responsible for waste from the time it is generated through until its legal recycling, recovery or disposal (including its method of disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final destination, waste contractors will be employed to physically transport waste to the final destination. Following on from this is the concept of *"Polluter Pays"* whereby the waste

producer is liable to be prosecuted for pollution incidents, which may arise from the incorrect management of waste produced, including the actions of any contractors engaged (e.g. for transportation and disposal/recovery/recycling of waste).

It is therefore imperative that the Developer ensures that the waste contractors engaged by demolition and construction contractors are legally compliant with respect to waste transportation, recycling, recovery and disposal. This includes the requirement that a contractor handle, transport and recycle/recover/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments* or a Waste or Industrial Emissions Licence granted by the EPA. The COR / permit / licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

3.0 Design Approach

The client and the design team have integrated the *'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects'* guidelines into the design workshops, to help review processes, identify and evaluate resource reduction measures and investigate the impact on cost, time, quality, buildability, second life and management post demolition and construction. Further details on these design principals can be found within the aforementioned guidance document.

The design team have undertaken the design process in line with the international best practice principles to firstly prevent wastes, reuse where possible and thereafter sustainably reduce and recover materials. The below sections have been the focal point of the design process and material selections and will continued to be analysed and investigated throughout the design process and when selecting material.

The approaches presented are based on international principles of optimising resources and reducing waste on construction projects through:

- Prevention;
- Reuse;
- Recycling;
- Green Procurement Principles;
- Off-Site Construction;
- Materials Optimisation; and
- Flexibility and Deconstruction.

3.1 Designing For Prevention, Reuse and Recycling

Undertaken at the outset and during project feasibility and evaluation the Client and Design Team considered:

- Establishing the potential for any reusable site assets (buildings, structures, equipment, materials, soils, etc.);
- The potential for refurbishment and refit of existing structures or buildings rather than demolition and new build;
- Assessing any existing buildings on the site that can be refurbished either in part or wholly to meet the Client requirements; and
- Enabling the optimum recovery of assets on site.

3.2 Designing for Green Procurement

Waste prevention and minimisation pre-procurement have been discussed and will be further discussed in this section. The Design Team will discuss proposed design solutions, encourage innovation in tenders and incentivise competitions to recognise sustainable approaches. They should also discuss options for packaging reduction with the main Contractor and subcontractors/suppliers using measures such as 'Just-in-Time' delivery and use ordering procedures that avoid excessive waste. The Green procurement extends from the planning stage into the detailed design and tender stage and will be an ongoing part of the long-term design and selection process for this development.

3.3 Designing for Off-Site Construction

Use of off-site manufacturing has been shown to reduce residual wastes by up to 90% (volumetric building versus traditional). The decision to use offsite construction is typically cost led but there are significant benefits for resource management. Some further considerations for procurement which are being investigated as part of the planning stage design process are listed as follows:

- Modular buildings as these can displace the use of concrete and the resource losses associated with concrete blocks such as broken blocks, mortars, etc.;
    - Modular buildings are typically pre-fitted with fixed plasterboard and installed insulation, eliminating these residual streams from site.
- Use of pre-cast structural concrete panels which can reduce the residual volumes of concrete blocks, mortars, plasters, etc.;
- The use of prefabricated composite panels for walls and roofing to reduce residual volumes of insulation and plasterboards;
- Using pre-cast hollow-core flooring instead of in-situ ready mix flooring or timber flooring to reduce the residual volumes of concrete/formwork and wood/packaging, respectively; and
- Designing for the preferential use of offsite modular units.

3.4 Designing for Materials Optimisation During Construction

To ensure manufacturers and construction companies adopt lean production models, including maximising the reuse of materials onsite . This helps to reduce the environmental impacts associated with transportation of materials and from waste management activities. This includes investigating the use of standardised sizes for certain materials to help reduce the amount of offcuts produced on site, focusing on promotion and development of off-site manufacture.

3.5 Designing for Flexibility and Deconstruction

Design flexibility has and will be investigated throughout the design process to ensure that where possible products (including buildings) only contain materials that can be recycled

and are designed to be easily disassembled. Material efficiency is being considered for the duration and end of life of a building project to produce; flexible, adaptable spaces that enable a resource-efficient, low-waste future change of use; durability of materials and how they can be recovered effectively when maintenance and refurbishment are undertaken and during disassembly/deconstruction.

4.0 DESCRIPTION OF THE DEVELOPMENT

4.1 Location, Size and Scale of the Development

The proposed 110kV underground transmission line connections will originate from the Kishoge 110kV GIS substation. The substation was permitted as part of the development under Reg. Ref.: SD19A/0042 and ABP Ref.: 305948-19, as amended under Reg. Ref.: SD22A/0105. The proposed 110kV underground transmission line connections extend northwards from the Kishoge 110kV substation, before proceeding to the east and then to the south, along the periphery of the lands in the ownership of the applicant, and continuing alongside the R120 before continuing to the south and crossing the R134 New Nangor Road. The route then proceeds further southward and to the southeast to cross the R120, continues to the south and then to the east (adjacent to the Old Nangor Road), crossing the Griffeen River and proceeding eastwards and then south before crossing the Baldonnel Road and proceeding eastward within lands to the south of the Grange Castle South Business Park access road, before reaching and connecting to the Aungierstown – Castlebaggot underground transmission line. The Kishoge to Aungierstown transmission line circuit will include 4 no. joint bays, while the Kishoge to Castlebaggot transmission line circuit will include 5 no. joint bays. The proposed 110kV underground transmission line connections will cover a distance of c. 2.2 kilometres.

The development includes enabling works, services diversions, joint bays, connections to the Kishoge substation and the Aungierstgown – Castlebaggot transmission line, provision of a medium voltage electricity connection to serve the Kishoge substation from an existing ESB substation to the east of the R120, landscaping, services, all associated construction works, and all ancillary works.

An Environmental Impact Assessment Report has been prepared in respect of this application.

The permitted Kishoge substation works (permitted under South Dublin County Council Reg. Ref.: SD19A/0042 and ABP Ref.: 305948-19 – Extant permission for substation and data storage facility development) is scheduled to commence construction in late Q 3 of 2022

An alteration to the permitted development and permission for further develop the site (South Dublin County Council Reg. Ref.: SD21A/0042), has been granted 19th January 2022 and the appeal period has lapsed on the 8th February 2022. On the basis of no appeals the works are scheduled to commence Q1 of 2023.

Travelling from the Aungierstown – Castlebaggot permitted underground 110kV transmission line the proposed transmission line follows the green verge of Profile Park roadway along the southern boundary in a north-westerly direction for c. 480 meters to Baldonnel Road, where the cable is culverted beneath the Baldonnel Road and continues northwards along the western boundary of the Baldonnel Road for c. 182 meters before continuing in a north-westerly direction towards the R120 across a greenfield site for 233 meters. There will be a horizontal directional drill (HDD) completed to install the cable

beneath the Griffeen River which flows in a north-easterly direction. The cable will then be routed parallel to the R120 within a greenfield site in a northerly directions towards the New Nangor Road where horizontal directional drilling will be utilised to route the cable under the New Nangor Road. The transmission line will continue along the western boundary of the R120 within a greenfield site turning west in the EdgeConnex site c. 200 meters south of the Grand Canal. The estimated length for the transmission line installation is c.2.2km.

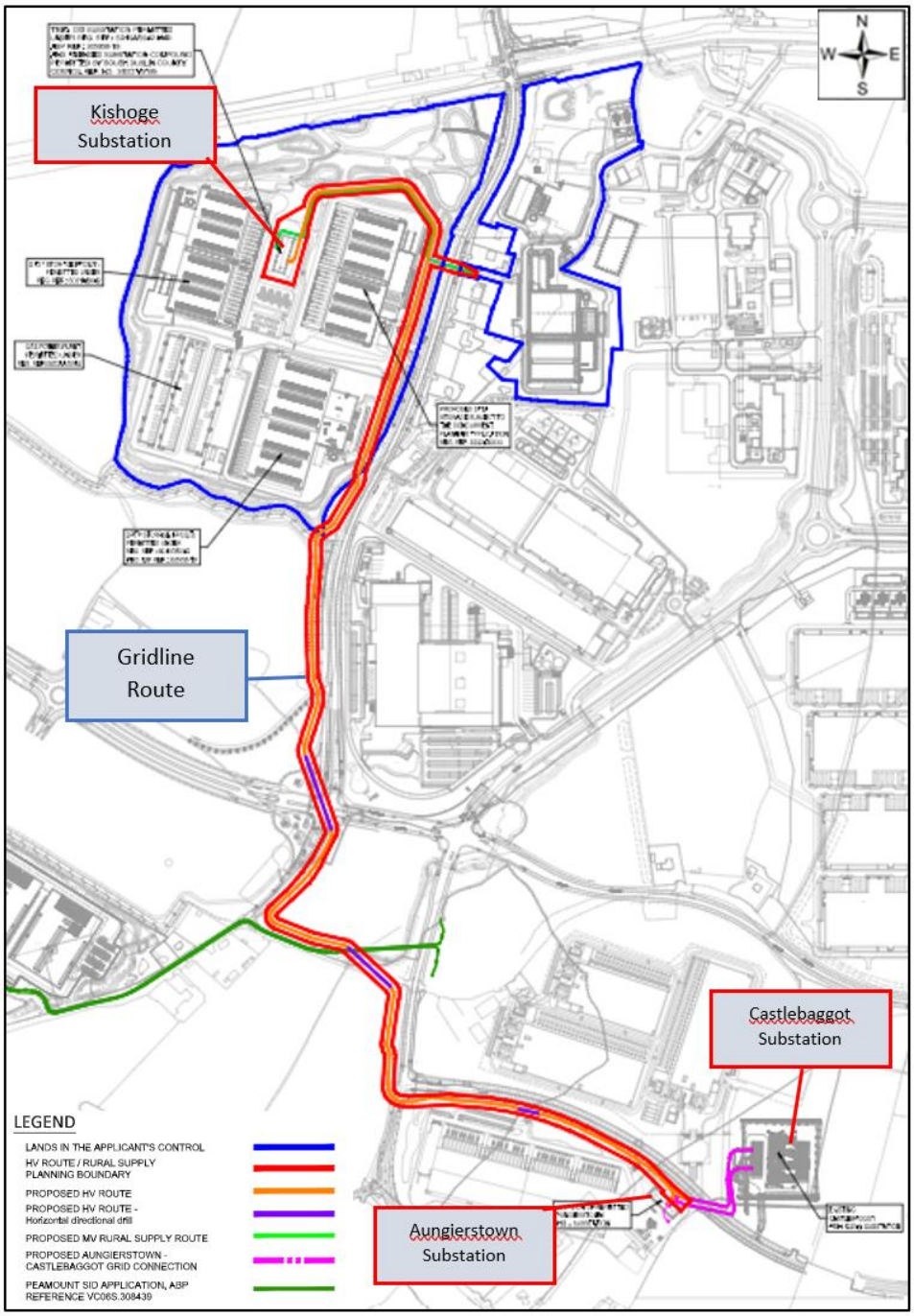


Figure 3.1 Proposed Site Layout

4.2 Details of the Non-Hazardous Wastes to be Produced

There will be soil, stone, gravel, clay and made ground excavated to facilitate the installation of the transmission line. The development engineers (Clifton Scannell Emerson Associates Consulting Engineers) have estimated that 7,000m^3 of material will need to be excavated to do so. It is currently envisaged that all of the excavated material will need to be removed offsite due to the limited opportunities for reuse on site. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

During the construction phase there may be a surplus of building materials, such as timber off-cuts, plastics, metals and waste from contractors generated. Plastic and cardboard waste from packaging and supply of materials will also be generated. The contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction workers e.g. 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 on site 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.

4.3 Potential Hazardous Wastes Arising

4.3.1 Contaminated Soil

Site investigations (SI) and environmental soil testing will be undertaken prior to the removal of any material from the site. Due to the nature of the project and the long distance that it covers, it is not currently possible to undertake SI investigations without causing disruptions.

If any potentially contaminated material is encountered, it will need to be segregated from clean / inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled *'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* [12] using the *HazWasteOnline* application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the *EC Council Decision 2003/33/EC* [13], which establishes the criteria for the acceptance of waste at landfills.

In the event that Asbestos Containing Materials (ACMs) are found within the excavated material, the removal will only be carried out by a suitably permitted waste contractor, in accordance with *S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.* All asbestos will be taken to a suitably licensed or permitted facility.

In the event that hazardous soil, or historically deposited waste is encountered during the construction phase, the contractor will notify SDCC and provide a Hazardous / Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal / treatment, in addition to information on the authorised waste collector(s).

4.3.2 Fuel/Oils

Fuels and oils are classed as hazardous materials; any on-site storage of fuel / oil, and all storage tanks and all draw-off points will be bunded and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and the site crew are trained in the appropriate refuelling techniques, it is not expected that there will be any fuel / oil waste generated at the site.

4.3.3 Invasive Plant Species

Site surveys were undertaken will be undertaken Scott Cawley Ecology. This will included a site walkover survey of the entire site, and around part of the outside perimeter to search for any invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011.

4.3.4 Other Known Hazardous Substances

Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor.

In addition, WEEE (containing hazardous components), printer toner / cartridges, batteries (Lead, Ni-Cd or Mercury) and / or fluorescent tubes and other mercury containing waste may be generated from during C&D activities or temporary site offices. These wastes, if generated, will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

5.0 Roles and Responsibilities

The *Best Practice Guidelines on the Preparation of Resource Waste Management Plans for Construction and Demolition Projects* promotes that a RWM should be appointed. The RWM may be performed by number of different individuals over the life-cycle of the Project, however it is intended to be a reliable person chosen from within the Planning/Design/Contracting Team, who is technically competent and appropriately trained, who takes the responsibility to ensure that the objectives and measures within the Project C&D RWMP are complied with. The RWM is assigned the requisite authority to meet the objective and obligations of the C&D RWMP. The role will include the important activities of conducting waste checks/audits and adopting construction and demolition methodology that is designed to facilitate maximum reuse and/or recycling of waste.

5.1 Role of the Client

The Client are the body establishing the aims and the performance targets for the project.

- The Client has commissioned the preparation and submission of a preliminary C&D RWMP as part of the design and planning submission;
- The Client is to commission the preparation and submission of an updated C&D RWMP as part of the construction tendering process;
- The Client will ensure that the C&D RWMP is agreed on and submitted to the local authority prior to commencement of works on site;

- The Client is to request the end-of-project C&D RWMP from the Contractor.

5.2 Role of the Client Advisory Team

The Client Advisory Team or Design Team is formed of architects, consultants, quantity surveyors and engineers and is responsible for:

- Drafting and maintaining the C&D RWMP through the design, planning and procurement phases of the project;
- Appointing a RWM to track and document the design process, inform the Design Team and prepare the C&D RWMP.
- Including details and estimated quantities of all projected waste streams with the support of environmental consultants/scientists. This should also include data on waste types (e.g. waste characterisation data, contaminated land assessments, site investigation information) and prevention mechanisms (such as by-products) to illustrate the positive circular economy principles applied by the Design Team;
- Managing and valuing the demolition work with the support of quantity surveyors;
- Handing over of the C&D RWMP to the selected Contractor upon commencement of construction of the development, in a similar fashion to how the safety file is handed over to the Contractor;
- Working with the Contractor as required to meet the performance targets for the project.

5.3 Future Role of the Contractor

The future demolition and construction Contractors have not yet been decided upon for this C&D RWMP. However, once select they will have major roles to fulfil. They will be responsible for:

- Preparing, implementing and reviewing the (including the Pre-Demolition) C&D RWMP throughout the demolition and construction phases (including the management of all suppliers and sub-contractors) as per the requirements of these guidelines;
- Identifying a designated and suitably qualified RWM who will be responsible for implementing the C&D RWMP;
- Identifying all hauliers to be engaged to transport each of the resources / wastes off-site;
- Implementing waste management policies whereby waste materials generated on site are to be segregated as far as practicable;
- Renting and operating a mobile-crusher to crush concrete for temporary reuse onsite during construction and reduce the amount of HGV loads required to remove material from site;
- Applying for the appropriate waste permit to crush concrete onsite;
- Identifying all destinations for resources taken off-site. As above, any resource that is legally classified as a ‘waste’ must only be transported to an authorised waste facility;
- End-of-waste and by-product notifications addressed with the EPA where required;
- Clarification of any other statutory waste management obligations, which could include on-site processing;

- Full records of all resources (both wastes and other resources) should be maintained for the duration of the project; and
- Preparing a C&D RWMP Implementation Review Report at project handover.

6.0 Key Materials & Quantities

6.1 Project Resource Targets

Project specific resource and waste management targets for the site have not yet been set and this information should be updated for these targets once these targets have been confirmed by the client. However, it is expected for projects of this nature that a minimum of 70% of waste is fully re-used, recycled or recovered. Target setting will inform the setting of project-specific benchmarks to track target progress. Typical Key Performance Indicators (KPIs) that may be used to set targets include (as per guidelines):

- Weight (tonnes) or Volume (m^3) of waste generated per construction value;
- Weight (tonnes) or Volume (m^3) of waste generated per construction floor area (m^2);
- Fraction of resource reused on site;
- Fraction of resource notified as by-product;
- Fraction of waste segregated at source before being sent off-site for recycling/recovery; and
- Fraction of waste recovered, fraction of waste recycled, or fraction of waste disposed.

6.2 Main Construction and Demolition Waste Categories

The main non-hazardous and hazardous waste streams that could be generated by the construction activities at a typical site are shown in Table **6.1**. The List of Waste (LoW) code (applicable as of 1 June 2015) (also referred to as the European Waste Code (EWC)) for each waste stream is also shown.

Table 6.1 *Typical waste types generated and LoW codes (individual waste types may contain hazardous substances)*

Waste Material	LoW/EWC Code
Concrete, bricks, tiles, ceramics	17 01 01-03 & 07
Wood, glass and plastic	17 02 01-03
Treated wood, glass, plastic, containing hazardous substances	17-02-04*
Bituminous mixtures, coal tar and tarred products	17 03 01*, 02 & 03*
Metals (including their alloys) and cable	17 04 01-11
Soil and stones	17 05 03* & 04
Gypsum-based construction material	17 08 01* & 02
Paper and cardboard	20 01 01
Mixed C&D waste	17 09 04
Green waste	20 02 01
Electrical and electronic components	20 01 35 & 36
Batteries and accumulators	20 01 33 & 34
Liquid fuels	13 07 01-10
Chemicals (solvents, pesticides, paints, adhesives, detergents etc.)	20 01 13, 19, 27-30
Insulation materials	17 06 04
Organic (food) waste	20 01 08
Mixed Municipal Waste	20 03 01

* *Individual waste type may contain hazardous substances*

7.0 RESOURCE AND WASTE MANAGEMENT

7.1 Demolition Waste Generation

There will be no demolition associated with this development.

7.2 Construction Waste Generation

Table 7.1 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA *National Waste Reports* [14] *and the joint EPA & GMIT study* [15].

There will be no traditional construction as part of this proposed development. The construction aspect of the development will consist of the installation of ducting and will require the excavation of one or two trenches along the route; the trench will contain two 110kV circuits. The trench will typically run parallel to each other along the length of the route, the separation of the 2 circuits will vary from 500mm to c. 3m depending on the existing ground conditions and existing underground services. Between five and ten separate ducts will be installed in each trench. For the purposes of this assessment, reference to the 'cable installation' includes both circuits.

As the proposed development is an underground transmission line which will be reinstated following construction to ground level, there is limited site infrastructure or secondary facilities required.

Table 7.1, below, shows the estimated construction waste generation for the proposed Project based on the area of construction and other information available to date, along with indicative targets for management of the waste streams. The estimated amounts for the main waste types (with the exception of soils and stones) are based on waste generation rate per m^2. These have been calculated from the schedule of development areas provided by the design team.

***Table 7.1**: Predicted on and off-site reuse, recycle and disposal rates for construction waste*

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	0.98	10	0.10	80	0.79	10	0.10
Timber	0.83	40	0.33	55	0.46	5	0.04
Metals	0.24	5	0.01	90	0.21	5	0.01
Concrete	0.18	30	0.05	65	0.12	5	0.01
Other	0.45	20	0.09	60	0.27	20	0.09
Total	**2.68**		**0.59**		**1.84**		**0.25**

In addition to the waste streams in Table 7.1, there will be c. 7,000 m^3 of soil, stones, clay and made ground excavated to facilitate construction of new foundations, underground services, and the installation of the proposed basements. Any suitable excavated material will be temporarily stockpiled for reuse as fill, where possible, but reuse on site is expected to be limited and all of the excavated material is expected to be removed off- site for appropriate reuse, recovery and / or disposal.

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 proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

7.3 Proposed Resource and Waste Management Options

Waste materials generated will be segregated on- site, where it is practical. Where the on-site segregation of certain wastes types is not practical, off- site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source, where feasible at the Edgeconnex site at Ballymakaily West of Newcastle Road (R120), Lucan, Co. Dublin. All waste receptacles leaving site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled. There are numerous waste contractors in the Dublin region that provide this service.

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arisings requiring disposal off- site will be reused, recycled, recovered or disposed of at a facility holding the appropriate registration, permit or licence, as required.

During construction, some of the sub-contractors on site will generate waste in relatively low quantities. The transportation of non-hazardous waste by persons who are not directly involved with the waste business, at weights less than or equal to 2 tonnes, and in vehicles not designed for the carriage of waste, are exempt from the requirement to have a waste collection permit (per Article 30 (1) (b) of the Waste Collection Permit Regulations 2007, as amended). Any sub-contractors engaged that do not generate more than 2 tonnes of waste at any one time can transport this waste off- site in their work vehicles (which are not designed for the carriage of waste). However, they are required to ensure that the receiving facility has the appropriate COR / permit / licence.

Written records will be maintained by the contractor(s), detailing the waste arising throughout the C&D phases, the classification of each waste type, waste collection permits for all waste contactors who collect waste from the site and COR / permit / licence for the receiving waste facility for all waste removed off- site for appropriate reuse, recycling, recovery and / or disposal

Dedicated bunded storage containers will be provided for hazardous wastes which may arise, such as batteries, paints, oils, chemicals, if required.

The anticipated management of the main waste streams is outlined as follows:

Soil, Stone, Gravel, Clay and Made Ground

The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The excavations are required to facilitate construction works so the preferred option (prevention and minimisation) cannot be accommodated for the excavation phase.

When material is removed off- site it could be reused as a by-product (and not as a waste). If this is done, it will be done in accordance with Article 27 of the *European Communities (Waste Directive) Regulations 2011*, which requires that certain conditions are met and that by-product notifications are made to the EPA via their online notification form. Excavated material should not be removed from site until approval from the EPA has been received. The potential to reuse material as a by-product will be confirmed during the course of the excavation works, with the objective of eliminating any unnecessary disposal of material.

The next option (beneficial reuse) may be appropriate for the excavated material, pending environmental testing to classify the material as hazardous or non-hazardous in accordance with the EPA *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* publication. Clean inert material may be used as fill material in other construction projects or engineering fill for waste licensed sites. Beneficial reuse of surplus excavation material as engineering fill may be subject to further testing to determine if materials meet the specific engineering standards for their proposed end use.

Any nearby sites requiring clean fill/capping material will be contacted to investigate reuse opportunities for clean and inert material. If any of 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. Similarly, if any soils/stones are imported onto the site from another construction site as a by-product, this will also be done in accordance with Article 27. Article 27 will be

investigated to see if the material can be imported onto this site for beneficial reuse instead of using virgin materials.

If the material is deemed to be a waste, then removal and reuse / recovery / disposal of the material will be carried out in accordance with the *Waste Management Acts 1996 – 2011* as amended, the *Waste Management (Collection Permit) Regulations 2007* as amended and the *Waste Management (Facility Permit & Registration) Regulations 2007* as amended. Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered.

In the event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately to any non-hazardous material. It will require off-site treatment at a suitable facility or disposal abroad via Transfrontier Shipment of Wastes (TFS).

Bedrock

While it is not envisaged that bedrock will be encountered, if bedrock is encountered, it is anticipated that it will not be crushed on site. Any excavated rock is expected to be removed off- site for appropriate reuse, recovery and / or disposal. If bedrock is to be crushed on- site, the appropriate mobile waste facility permit will be obtained from SDCC.

Silt & Sludge

During the construction phase, silt and petrochemical interception will be carried out on run-off and pumped water from site works, where required. Sludge and silt will then be collected by a suitably licensed contractor and removed off- site.

Concrete Blocks, Bricks, Tiles & Ceramics

The majority of concrete blocks, bricks, tiles and ceramics generated as part of the construction works are expected to be clean, inert material and should be recycled, where possible. If concrete is to be crushed on- site, the appropriate mobile waste facility permit will be obtained from SDCC.

Hard Plastic

As hard plastic is a highly recyclable material, much of the plastic generated will be primarily from material off-cuts. All recyclable plastic will be segregated and recycled, where possible.

Timber

Timber that is uncontaminated, i.e. free from paints, preservatives, glues, etc., will be disposed of in a separate skip and recycled off- site.

Metal

Metals will be segregated, where practical, and stored in skips. Metal is highly recyclable and there are numerous companies that will accept these materials.

Plasterboard

There are currently a number of recycling services for plasterboard in Ireland. Plasterboard from the construction phases will be stored in a separate skip, pending collection for recycling. The site Manager will ensure that oversupply of new plasterboard is carefully monitored to minimise waste.

Glass

Glass materials will be segregated for recycling, where possible.

Waste Electrical & Electronic Equipment (WEEE)

Any WEEE will be stored in dedicated covered cages / receptacles / pallets pending collection for recycling.

Other Recyclables

Where any other recyclable wastes, such as cardboard and soft plastic, are generated, these will be segregated at source into dedicated skips and removed off- site.

Non-Recyclable Waste

C&D waste which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboards, will be placed in separate skips or other receptacles. Prior to removal from site, the non-recyclable waste skip / receptacle will be examined by a member of the waste team (see Section 9.0) to determine if recyclable materials have been placed in there by mistake. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

Asbestos Containing Materials

Any asbestos or ACM found on- site should be removed by a suitably competent contractor and disposed of as asbestos waste before the demolition works begin. All asbestos removal work or encapsulation work must be carried out in accordance with *S.I. No. 589 of 2010 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010.*

Other Hazardous Wastes

On-site storage of any hazardous wastes produced (i.e. contaminated soil if encountered and / or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous wastes will be recovered, wherever possible, and failing this, disposed of appropriately.

On-Site Crushing

It is currently not envisaged that the crushing of waste materials will occur on- site. However, if the crushing of material is to be undertaken, a mobile waste facility permit will first be obtained from SDCC and the destination of the accepting waste facility will be supplied to the SDCC waste unit.

7.4 Tracking and Documentation Procedures for Off-Site Waste

All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by a weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the nominated project Waste Manager (see Section 9.0).

All movement of waste and the use of waste contractors will be undertaken in accordance with the *Waste Management Acts 1996 - 2011*, *Waste Management (Collection Permit) Regulations 2007* as amended and *Waste Management (Facility Permit & Registration) Regulations 2007* and amended. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project RWM (see Section 9.0) will maintain a copy of all waste collection permits on-Site.

If the waste is being transported to another site, a copy of the Local Authority waste COR / permit or EPA Waste / Industrial Emissions Licence for that site will be provided to the nominated project RWM (see Section 9.0). If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) notification document will be obtained from DCC (as the relevant authority on behalf of all Local Authorities in Ireland) and kept on-Site along with details of the final destination (COR, permits, licences, etc.). A receipt from the final destination of the material will be kept as part of the on-Site waste management records.

All information will be entered in a waste management recording system to be maintained on-Site.

8.0 ESTIMATED COST OF WASTE MANAGEMENT

An outline of the costs associated with different aspects of waste management is outlined below. The total cost of C&D waste management will be measured and will take into account handling costs, storage costs, transportation costs, revenue from rebates and disposal costs.

8.1 Reuse

By reusing materials on site, there will be a reduction in the transport and recycle / recovery / disposal costs associated with the requirement for a waste contractor to take the material off-Site. Clean and inert soils, gravel, stones, etc., which cannot be reused on-Site may be used as access roads or capping material for landfill sites, etc. This material is often taken free of charge or at a reduced fee for such purposes, reducing final waste disposal costs.

8.2 Recycling

Salvageable metals will earn a rebate, which can be offset against the costs of collection and transportation of the skips.

Clean, uncontaminated cardboard and certain hard plastics can also be recycled. Waste contractors will charge considerably less to take segregated wastes, such as recyclable waste, from a site than mixed waste.

Timber can be recycled as chipboard. Again, waste contractors will charge considerably less to take segregated wastes, such as timber, from a site than mixed waste.

8.3 Disposal

Landfill charges are currently at around €130 - €150 per tonne which includes a €75 per tonne landfill levy specified in the *Waste Management (Landfill Levy) Regulations 2015*. In addition to disposal costs, waste contractors will also charge a collection fee for skips.

Collection of segregated C&D waste usually costs less than municipal waste. Specific C&D waste contractors take the waste off-site to a licensed or permitted facility and, where possible, remove salvageable items from the waste stream before disposing of the remainder to landfill. Clean soil, rubble, etc., is also used as fill / capping material, wherever possible.

9.0 TRAINING PROVISIONS

A member of the construction team will be appointed as the RWM to ensure commitment, operational efficiency and accountability in relation to waste management during the C&D phases of the development.

9.1 Waste Manager Training and Responsibilities

The nominated RWM will be given responsibility and authority to select a waste team if required, i.e. members of the site crew that will aid them in the organisation, operation and recording of the waste management system implemented on site.

The RWM will have overall responsibility to oversee, record and provide feedback to the client on everyday waste management at the site. Authority will be given to the RWM to delegate responsibility to sub-contractors, where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and material salvage.

The RWM will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on site. The RWM will also be trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and be knowledgeable in how to implement this C&D RWMP.

9.2 Site Crew Training

Training of site crew in relation to waste is the responsibility of the RWM and, as such, a waste training program should be organised. A basic awareness course will be held for all site crew to outline the C&D RWMP and to detail the segregation of waste materials at source. This may be incorporated with other site training needs such as general site induction, health and safety awareness and manual handling.

This basic course will describe the materials to be segregated, the storage methods and the location of the Waste Storage Areas (WSAs). A sub-section on hazardous wastes will be incorporated into the training program and the particular dangers of each hazardous waste will be explained.

10.0 TRACKING AND TRACING / RECORD KEEPING

Records should be kept for all waste material which leaves the site, either for reuse on another site, recycling or disposal. A recording system will be put in place to record the waste arisings on Site.

A waste tracking log should be used to track each waste movement from the site. On exit from the site, the waste collection vehicle driver should stop at the site office and sign out as a visitor and provide the security personnel or RWM with a waste docket (or Waste Transfer Form (WTF) for hazardous waste) for the waste load collected. At this time, the security personnel should complete and sign the Waste Tracking Register with the following information:

- Date
- Time
- Waste Contractor
- Company waste contractor appointed by, e.g. Contractor or subcontractor name
- Collection Permit No.
- Vehicle Reg.
- Driver Name
- Docket No.
- Waste Type
- EWC / LoW

The waste vehicle will be checked by security personal or the RWM to ensure it has the waste collection permit no. displayed and a copy of the waste collection permit in the vehicle before they are allowed to remove the waste from the site.

The waste transfer dockets will be transferred to the RWM on a weekly basis and can be placed in the Waste Tracking Log file. This information will be forwarded onto the SDCC Waste Regulation Unit when requested.

Alternatively, each subcontractor that has engaged their own waste contractor will be required to maintain a similar waste tracking log with the waste dockets / WTF maintained on file and available for inspection on site by the main contractor as required. These subcontractor logs will be merged with the main waste log.

Waste receipts from the receiving waste facility will also be obtained by the site contractor(s) and retained. A copy of the Waste Collection Permits, CORs, Waste Facility Permits and Waste Licences will be maintained on site at all times and will be periodically checked by the RWM. Subcontractors who have engaged their own waste contractors, should provide the main contractor with a copy of the waste collection permits and COR / permit / licence for the receiving waste facilities and maintain a copy on file, available for inspection on site as required.

11.0 OUTLINE WASTE AUDIT PROCEDURE

11.1 Responsibility for Waste Audit

The appointed RWM will be responsible for conducting a waste audit at the site during the C&D phase of the proposed Project. Contact details for the nominated RWM will be

provided to the SDCC Waste Regulation Unit after the main contractor is appointed and prior to any material being removed from site.

11.2 Review of Records and Identification of Corrective Actions

A review of all waste management costs and the records for the waste generated and transported off-site should be undertaken mid-way through the demolition and construction phase of the proposed Project.

If waste movements are not accounted for, the reasons for this should be established in order to see if and why the record keeping system has not been maintained. The waste records will be compared with the established recovery / reuse / recycling targets for the site. Each material type will be examined, in order to see where the largest percentage waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how the targets can be achieved.

Upon completion of the C&D phase, a final report will be prepared, summarising the outcomes of waste management processes adopted and the total recycling / reuse / recovery figures for the development.

12.0 CONSULTATION WITH RELEVANT BODIES

12.1 Local Authority

Once construction contractors have been appointed and have appointed waste contractors, and prior to removal of any C&D waste materials off-site, details of the proposed destination of each waste stream will be provided to the SDCC Waste Regulation Unit.

SDCC will also be consulted, as required, throughout the demolition, excavation and construction phases in order to ensure that all available waste reduction, reuse and recycling opportunities are identified and utilised and that compliant waste management practices are carried out.

12.2 Recycling / Salvage Companies

The appointed waste contractor for the main waste streams managed by the demolition and construction contractors will be audited in order to ensure that relevant and up-to-date waste collection permits and facility registrations / permits / licences are held. In addition, information will be obtained regarding the feasibility of recycling each material, the costs of recycling / reclamation, the means by which the wastes will be collected and transported off- site, and the recycling / reclamation process each material will undergo off- site.

13.0 REFERENCES

1. Waste Management Act 1996 (No. 10 of 1996) as amended.
2. Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
3. Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
4. Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015).
5. Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998).
6. Forum for the Construction Industry – *Recycling of Construction and Demolition Waste.*
7. Department of Communications, Climate Action and Environment (DCCAE), *Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025* (Sept 2020).
8. DCCAE, *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less*' (2021)
9. Environmental Protection Agency (EPA) *'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021)*
10. Department of Environment, Heritage and Local Government, *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* (2006).
11. FÁS and the Construction Industry Federation (CIF), *Construction and Demolition Waste Management – a handbook for Contractors and* site *Managers* (2002).
12. South Dublin County Council (SDCC), South Dublin County Council Development Plan 2016-2022 (2016)
13. SDCC, Draft South Dublin County Council Development Plan 2022-2028 (2021)
14. Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended
15. EPA, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2015)
16. 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.
17. Environmental Protection Agency (EPA), *National Waste Database Reports 1998 – 2012*.
18. EPA and Galway-Mayo Institute of Technology (GMIT), *EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned* (2015).

14.0 MATERIAL ASSETS

14.1 INTRODUCTION

This chapter evaluates the impacts, if any, which the proposed development may have on Material Assets as defined in the EPA *"Guidelines on Information to be Contained in Environmental Impact Assessment Reports" (2*022) and EPA "*Advice Notes for preparing Environmental Impact Statements"* (2022).

14.2 METHODOLOGY

The EPA EIA Guidelines (2022) state that material assets refer to built services and infrastructure, roads and traffic and waste management. The Draft EPA Advice notes also give the following examples of material assets; non-renewable resources e.g. soils, ownership and access and tourism. In this EIA Report, the impacts on the various material assets described above have been considered in the following chapters of this EIA Report as follows:

- Chapter 4 Population and Human Health
- Chapter 5 Land, Soils, Geology and Hydrogeology
- Chapter 12 Traffic & Transportation
- Chapter 13 Waste Management.

This chapter assesses ownership and access, built services and infrastructure. Section 14.3 addresses ownership and access. The subsequent sections address built services and infrastructure. The potential impacts on built services and infrastructure, if any, are assessed in terms of the following:

- Power and Electrical Supply;
- Telecommunications;
- Water supply;
- Foul drainage infrastructure; and
- Surface water infrastructure.

Mitigation measures are proposed where required.

14.3 OWNERSHIP AND ACCESS

The route for the proposed underground double circuit 110 kilovolt (kV) transmission cable installation travels through lands which are outlined indicated in Drawing No. ESSDUB98-CSE-01-XX-DR-C-2120 included in the Planning Drawings along with letters of consent are submitted with the planning documentation.

As the operational phase of the project will fall under the management of Eirgrid, the Applicant will not require access to the 3rd party owned lands during the operational phase of the project.

14.4 RECEIVING ENVIRONMENT

The associated built services and infrastructure on and in the vicinity of the site are summarised in the following sections.

14.4.1 Power and Electrical Supply

The Proposed Development is for the grid connection between the Kishoge Substation and two 110kV substations at Aungierstown and Castlebaggot within the Grangecastle South Business Park.

14.4.2 Water Supply, Foul Drainage and Surface water Infrastructure

Surveys of the proposed construction route have highlighted any existing foul, storm and water supply infrastructure Drawing No. ESSDUB98-CSE-01-XX-DR-C-2121 to 2127 included in the Planning Drawings. No significant barriers to crossing of same were identified.

14.5 CHARACTERISTICS OF THE DEVELOPMENT

14.5.1 Power and Electrical Supply

The proposed 110kv cable installation will run from the Aungierstown – Castlebaggot underground 110kV transmission line to the permitted Kishoge substation, providing a permanent power supply to the substation, the Applicant's site at Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin, including the permitted and proposed data storage facility and the wider grange Castle Business Park, as well as serving the wider Grangecastle and Lucan area.

The nature of the proposed development ensures continuity of supply of electricity.

14.5.2 Water Supply, Foul Drainage and Surface Water Infrastructure

The nature and design of the proposed development, a cable installation, ensures there will be no demand for water supply, foul drainage or surface water management that will require infrastructural support.

14.6 POTENTIAL IMPACTS OF THE DEVELOPMENT

14.6.1 Construction Phase

Power and Electrical Supply
The contractors compound for the construction works for the proposed development is located within the Applicants site at Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin. During construction, contractors will require power for their onsite accommodation which will be sourced from the power supply at the permitted site when construction is completed.

In addition, some on-site equipment/plant and on-site lighting will require power supply which will be delivered through temporary on-site generators when works are underway on the section of the proposed cable installation along the R120, the Baldonnel Road and Profile Park Road..

Telecommunications
Telecommunications including fibre required during the construction phase will be provided via a mobile connection.

There are no potential impacts associated with telecommunications for the proposed development for the construction phase.

Water Supply
Welfare facilities (toilets etc.) will be required for the small number of construction staff. The location for the contractors compound within the Applicants site at Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin will have a live 150mm watermain, is fed from the public supply and has been addressed as of the permitted works at that site.

Water supply will not be required for construction works along the route.

Foul Drainage Infrastructure
Welfare facilities (canteens, toilets etc.) will be required for the construction crew at the construction compound. Portable toilets may be provided onsite for construction staff.

There will be no impact from construction works on the existing foul sewer network during construction.

Surface Water Infrastructure
The construction of the cable installation will have no impact on existing surface water drainage along the route.

14.6.2 Operational Phase

There will be no impacts on Telecommunications, Water Supply, Foul Drainage Infrastructure and Surface Water Infrastructure during the operational phase. The nature of the proposed development ensures that rather than utilising electricity, the proposed development will ensure supply of electricity.

14.7. REMEDIAL AND MITIGATION MEASURES

14.7.1 Construction Phase

Construction of the proposed development will not require additional drainage and power from existing services. Surveys completed by CSEA have identified where diversion of any services within the road will be required, which includes a river crossing. Ongoing consultation with ESB Networks, Eirgrid, SDCC, Irish Water, Inland Fisheries Ireland 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.

Strict quality control measures will be undertaken while laying pipes to minimise or eradicate infiltration.

14.7.2 Operational Phase

Power, Electricity Supply & Telecommunications
The cable installation has been designed in accordance with ESB Networks requirements. No remedial or mitigation measures are required in relation to power electricity or telecommunications supply.

Water Supply, Foul Drainage Infrastructure and Surface Water Infrastructure
During operation, there is no requirement for water supply, foul drainage or surface water infrastructure. As such no remedial or mitigation measures are required.

14.8 PREDICTED IMPACTS OF THE DEVELOPMENT

14.8.1 Construction Phase

Power and Electricity Supply
Temporary supplies will be required for the proposed development. No predicted impact on the national or local network.

Telecommunications
There are no predicted impacts associated with telecommunications for the proposed development for the construction phase on the national or local network.

Water Supply, Surface Water & Foul Drainage Infrastructure
There are no predicted impacts for the proposed development for the construction phase. The works contractor will be required to maintain existing services

Predicted Impact – Construction Phase
The implementation of mitigation measures detailed in Section 14.7.1 will ensure that the predicted impacts on the material assets will be ***temporary***, ***neutral*** and ***imperceptible*** for the construction phase.

14.8.2 Operational Phase

Power, Electrical Supply and Telecommunications
The proposed development is the power supply. This has been designed in accordance with ESB Network requirements to meet their assessment of capacity requirements.

Water Supply, Surface Water Infrastructure and Foul Drainage Infrastructure
There is no likely impact on water supply, surface water infrastructure and foul drainage infrastructure post construction.

Predicted Impact – Operational Phase
The implementation of mitigation measures detailed in Section 14.7.2 will ensure that the predicted impacts on the material assets will be ***long-term***, ***neutral*** and ***imperceptible.***

14.9 CUMULATIVE IMPACTS

During operation there is no potential for cumulative impact in relation to material assets.

During construction, considering the developments outlined in Table 2.1 and Chapter 3, the potential for cumulative impact on water, foul drainage and stormwater drainage infrastructure is considered as ***short term imperceptible.*** Each development will be required to maintain existing service networks and remedy any disruptions caused by construction. In addition, use of services during construction will be by agreement with the utility providers based on availability and capacity within these services.

14.10 RESIDUAL IMPACTS

The proposed development entails minimal use of material assets during construction with no impact once operational. The overall predicted impact of the proposed

development can be classed as ***long-term*** and ***not significant*** with respect to material assets.

The assessment has considered cumulative impact of construction and operation in conjunction with surrounding developments. Considering the minimal use of material assets (temporary lighting and power) during construction, there is no likely cumulative impact.

14.11 MONITORING

No monitoring is proposed.

APPENDIX 14.1

LETTERS OF CONSENT FOR ACCESS TO 3RD PARTY LANDS

CYRUSONE IRISH DATACENTRES HOLDINGS LIMITED

Suite 3,
One Earlsfort Centre,
Lower Hatch Street

An Bord Pleanála
64 Marlborough St,
Dublin 1,
D01 V902

Date: 22 August, 2022

To Whom It May Concern,

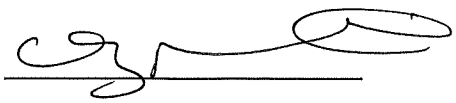
RE: Provision of Underground 110Kv Transmission Line Connections between the Gas Insulated Substation (GIS) Aungierstown – Castlebaggot underground 110Kv transmission line, Grange Castle South, Baldonnel Co. Dublin, and the permitted 110Kv GIS Substation permitted by South Dublin County Council Reg. Ref.: SD19A/0042 and ABP Ref.: 305948-19, as amended under Reg. Ref.: SD22A/0105.

I refer to the above referenced application for consent to An Bord Pleanála under section 182 of the Planning and Development Act 2000, as amended.

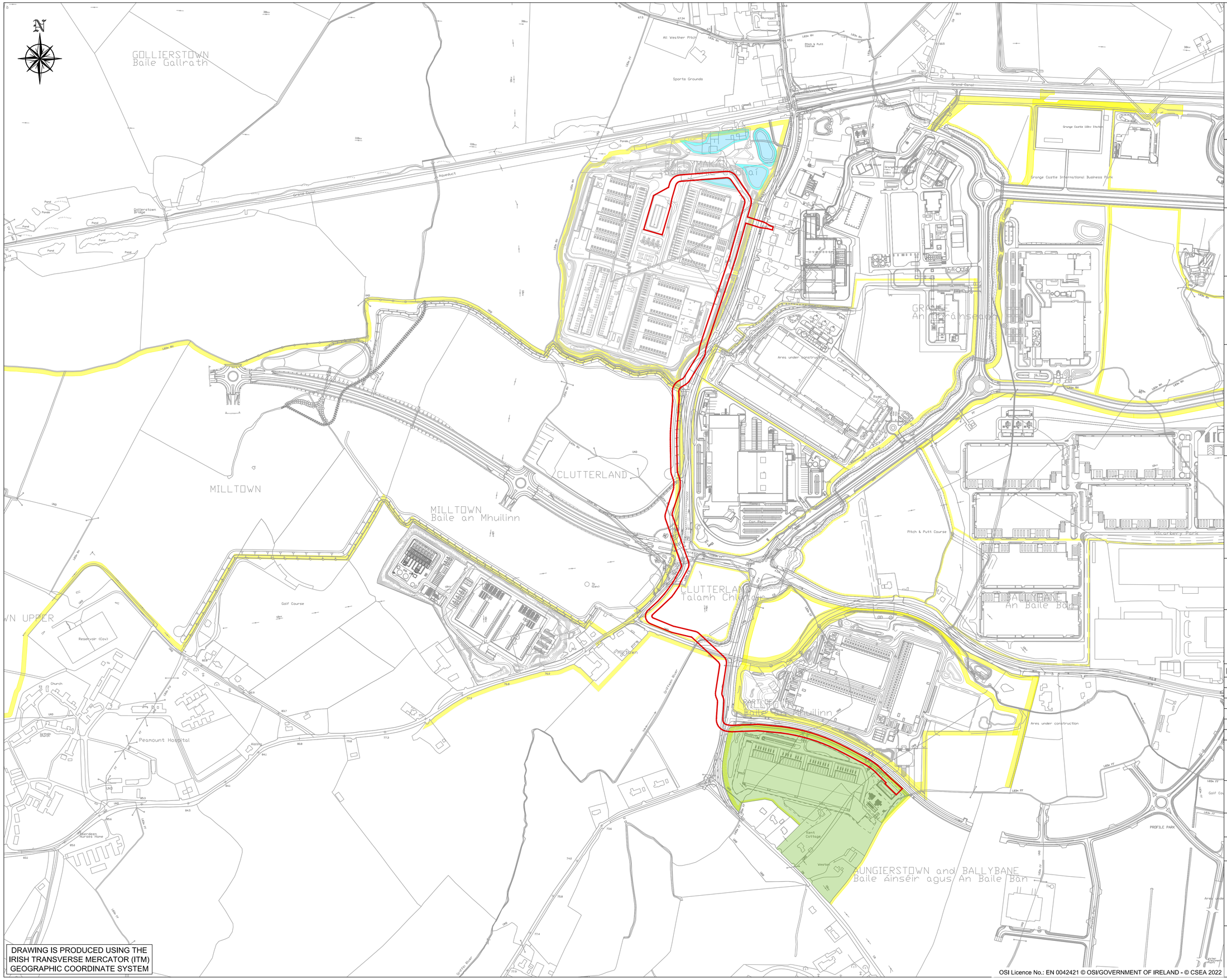
I hereby consent to an application, under section 182 of the Act, being made on the land which is within our control and is within the area outlined in red on the enclosed drawing Reference No. ESSDUB98-CSE-01-XX-DR-C-1118, Rev P01.

For the avoidance of doubt, this consent is solely to the making of this application in respect of the above-referenced proposed development, and not for any other purpose, including permission to access the lands for the execution of the proposed works (which will be subject to further agreement).

Yours sincerely

SIGNED: 

on behalf of CYRUSONE IRISH DATACENTRES HOLDINGS LIMITED



DRAWING IS PRODUCED USING THE IRISH TRANSVERSE MERCATOR (ITM) GEOGRAPHIC COORDINATE SYSTEM

CLIENT

edgeconnex®

BCEI
BURR COMPUTER ENVIRONMENTS, INC.

10400 Rodgers Road
Houston, Texas 77070
Phone: 281-374-8644
Fax: 281-374-8992

HV Main Contractor

H&MV ENGINEERING
High Voltage Specialists

STRUCTURAL ENGINEER

Clifton Scannell Emerson Associates

ARCHITECT

Henry J Lyons

LEGEND

- PLANNING BOUNDARY
- LANDS UNDER CYRUS ONE CONTROL
- EXISTING WAYLEAVE

NOTES

DISCIPLINE

Clifton Scannell Emerson Associates

PROJECT

ESSDUB98
KISHOGE 110KV SUBSTATION

Rev	Date	Description	By	Ckd
P01	11/08/2022	FOR PLANNING	ZS	HF

Drawn by	Checked by	Date
ZS	HF	11/08/2022
Scale (@ A1)	Status code	Project number
1:4000	S1	21_100

Drawing Title

OVERALL HV ROUTE MAP IN CYRUSONE LANDS

Drawing Number

(Project Code-Originator-Volume-Level-Type-Role-Sheet no.) Revision

ESSDUB98-CSE-01-XX-DR-C-1118 P01

Mr Hubert Feneran
Director
CSEA Consulting Engineers
3rd Floor The Highline
Bakers Point
Pottery Road
Dun Laoghaire
Co Dublin

Date: 24 Aug 2022

WITHOUT PREJUDICE
SUBJECT TO CONTRACT/CONTRACT DENIED

Dear Hubert

Re: Proposed Grant of Consent to EdgeConnex Ireland Limited to include lands for the Provision of Underground 110Kv Transmission Line Connections between the Gas Insulated Substation (GIS) Aungierstown – Castlebaggot underground 110Kv transmission line, Grange Castle South, Baldonnel Co. Dublin, and the permitted 110Kv GIS Substation permitted by South Dublin County Council Reg. Ref. SD19A/0042 and ABP Ref. 305948-19, as amended under Reg. Ref. SD22A/0105.

I refer to your request, on behalf of Edgeconnex Ireland Ltd., to include lands in Council ownership in a proposed development of underground 110Kv transmission line connections and associated development and site works.

I now wish to confirm that South Dublin County Council hereby grants its consent to include lands outlined in red on attached Drawing No. ESSDUB98-CSE-01-XX-DR-C-1116 Rev P01 in a planning application for the purposes outlined above.

Please note that this consent does not convey to CSEA Consulting Engineers or their client, Edgeconnex Ireland Ltd., any interest whatsoever in the subject lands and is for the sole purpose of allowing a planning application to be made.

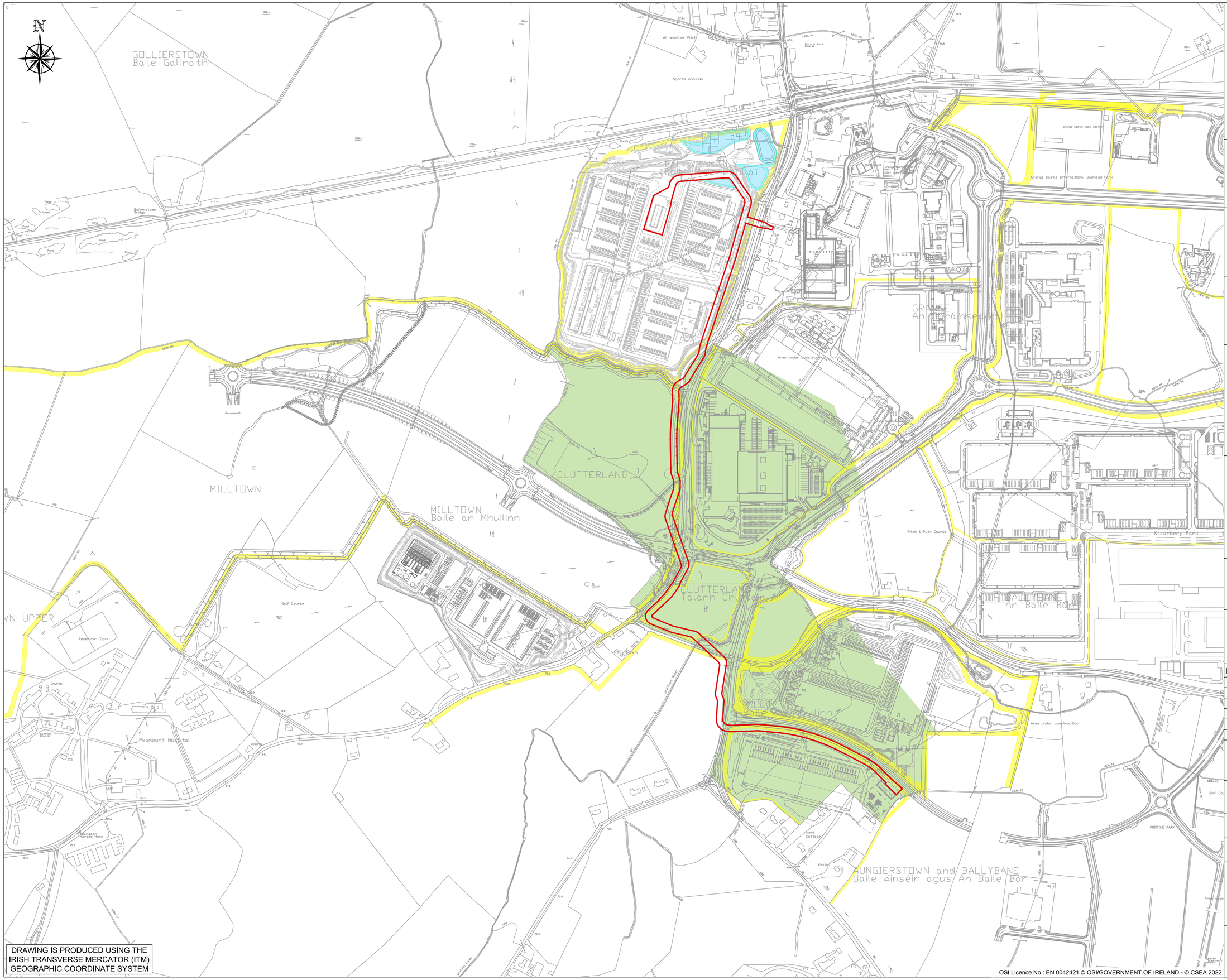
This consent is valid for a period of twelve months from date of this letter.

The consent is conditional on no development taking place until full planning permission has been granted and the Council is in a position to enter into an appropriate agreement with Edgeconnex Ireland Ltd. in respect of the lands.

Yours sincerely

Laura Leonard
Senior Executive Officer

Encl



DRAWING IS PRODUCED USING THE IRISH TRANSVERSE MERCATOR (ITM) GEOGRAPHIC COORDINATE SYSTEM

CLIENT

edgeconnex®

BCEI
BURR COMPUTER ENVIRONMENTS, INC.

10400 Rodgers Road
Houston, Texas 77070
Phone: 281-374-8644
Fax: 281-374-8992

HV Main Contractor

H&MV ENGINEERING
High Voltage Specialists

STRUCTURAL ENGINEER

Clifton Scannell Emerson Associates

ARCHITECT

Henry J Lyons

LEGEND

- PLANNING BOUNDARY
- LANDS UNDER SDCC CONTROL
- EXISTING WAYLEAVE

NOTES

DISCIPLINE

Clifton Scannell Emerson Associates

PROJECT

ESSDUB98
KISHOGE 110KV SUBSTATION

Rev	Date	Description	By	Ckd
P01	11/08/2022	FOR PLANNING	ZS	HF

Drawn by	Checked by	Date
ZS	HF	11/08/2022
Scale (@ A1)	Status code	Project number
1:4000	S1	21_100

Drawing Title

OVERALL HV ROUTE MAP IN SDCC LANDS

Drawing Number

(Project Code-Originator-Volume-Level-Type-Role-Sheet no.) Revision

ESSDUB98-CSE-01-XX-DR-C-1116 P01

Miller Turner Developments Limited

Elmhurst, 27 Herbert Avenue
Merrion Road,
Dublin 4
D04 E0W7

An Bord Pleanála
64 Marlborough St,
Dublin 1,
D01 V902

Date: August 12th, 2022

To Whom It May Concern,

RE: Provision of Underground 110Kv Transmission Line Connections between the Gas Insulated Substation (GIS) Aungierstown – Castlebaggot underground 110Kv transmission line, Grange Castle South, Baldonnel Co. Dublin, and the permitted 110Kv GIS Substation permitted by South Dublin County Council Reg. Ref.: SD19A/0042 and ABP Ref.: 305948-19, as amended under Reg. Ref.: SD22A/0105.

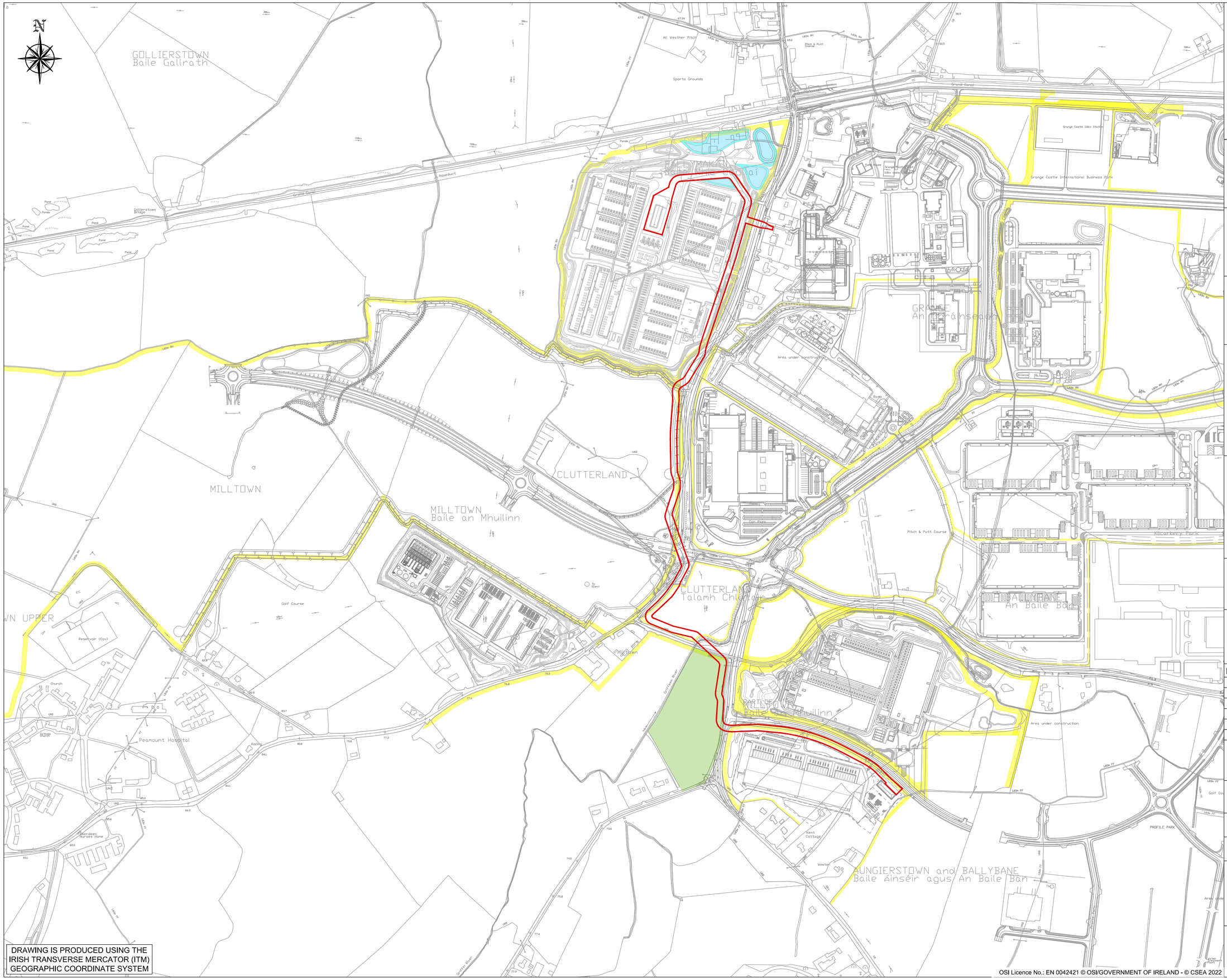
I refer to the above referenced application for consent to An Bord Pleanála under section 182 of the Planning and Development Act 2000, as amended.

I hereby consent to an application under section 182 of the Act for the provision being made on land within my control as Outlined in red on the enclosed drawing Reference No. ESSDUB98-CSE-01-XX-DR-C-1117, Rev P01.

For the avoidance of doubt, this consent is solely to the making of this application in respect of the above-referenced proposed development, and not for any other purpose, including permission to access the lands for the execution of the proposed works (which will be subject to further agreement).

Yours sincerely

SIGNED: _____



CLIENT

edgeconnex®

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10400 Rodgers Road
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HV Main Contractor

H&MV ENGINEERING
High Voltage Specialists

STRUCTURAL ENGINEER

Clifton Scannell Emerson Associates

ARCHITECT

Henry J Lyons

LEGEND

- PLANNING BOUNDARY
- LANDS UNDER MILLER TURNER CONTROL
- EXISTING WAYLEAVE

NOTES

DISCIPLINE

Clifton Scannell Emerson Associates

PROJECT

ESSDUB98
KISHOGE 110KV SUBSTATION

Rev	Date	Description	By	Ckd
P01	11/08/2022	FOR PLANNING	ZS	HF

Drawn by	Checked by	Date
ZS	HF	11/08/2022
Scale (@ A1)	Status code	Project number
1:4000	S1	21_100

Drawing Title

OVERALL HV ROUTE MAP IN MILLER-TURNER LANDS

Drawing Number

(Project Code-Originator-Volume-Level-Type-Role-Sheet no.) Revision

ESSDUB98-CSE-01-XX-DR-C-1117 P01

15.0 INTERACTIONS

15.1 INTRODUCTION

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.

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.

15.2 DISCUSSION – POSITIVE IMPACTS

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
The Kishoge 110kV transmission cable installation will be designed to support current power demand and future growth within the Grange Castle area inclusive but not limited to the power requirements for the permitted, proposed and future development within the site data storage facility for Edgeconnex at Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin.

The proposed development will create between 10-30 temporary jobs during the construction phase, which will have a temporary, positive, imperceptible effect on employment and business in the Clondalkin/Lucan areas.

15.3 DISCUSSION – NEUTRAL IMPACTS

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
The construction of the proposed development will require site preparation, excavations and levelling works from the permitted Aungierstown – Castlebaggot underground 110kV transmission line located at Grange Castle South Business Park, Baldonnel, Dublin 22 to the permitted Kishoge110kV Substation located at Ballymakaily, West of Newcastle Road (R120), Lucan, Co. Dublin. As the site for development runs through land which is not used (in full or in part) for agricultural use and is mostly adjacent to roadway, there will be no localised loss of farmland. As such, the effect is ***long-term, imperceptible*** and ***neutral***.

Hydrology
A potential impact of the construction works proposed is on surface water quality due to sediment laden run-off, material spillages during construction works. The use of Horizontal Directional Drilling (HDD) beneath the River Griffeen and the implementation

of a Construction Environmental Management Plan (CEMP) will ensure that any construction effects on the hydrology of the site will be ***temporary, imperceptible*** and ***neutral***.

Biodiversity
As detailed in Chapter 7 (Biodiversity), there are no rare or protected habitats recorded in the study area inside the site boundary. The proposed development area may be considered of Low Local Ecological Value. The predicted effects on biodiversity are ***neutral*** and ***imperceptible*** for the construction and operational phases.

Air Quality and Climate
There is a potential for the construction activity to impact on air quality in terms of dust generated but mitigation measures outlined in Chapter 8 (Air Quality & Climate) of this EIA Report, implemented through the CEMP will ensure a ***temporary, imperceptible*** and ***neutral*** effect. There is no impact during operation.

Archaeological, Architectural and Cultural Heritage
The archaeological, architectural and cultural heritage assessment for the proposed development indicated that there are no features of archaeological potential within the site. However, ground disturbance during the construction phase has the potential to encounter features which will then be recorded if encountered. This will ensure that the effect is ***long-term, imperceptible*** and ***neutral***.

Waste Management
As detailed in Chapter 13 (Waste Management), c. 7000m^3 of excavated soil and stone may be generated from the construction of the route. 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
No wastewater will be generated from the proposed development therefore the effect of the proposed development is considered to be ***neutral***.

Air Quality and Climate on:

Hydrology
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***.

Biodiversity
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***.

Population and Human Health
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 soiling or human health effects are ***short-term*** and ***imperceptible***.

Noise and Vibration on:

Population and Human Health
The potential impact of noise and vibration on the local population is discussed in Chapter 4 (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 ***short-term*** and ***imperceptible***. There will be no operational noise and therefore, there will not be a significant impact on human health.

Landscape and Visual on:

Population and Human Health
The predicted impact of the proposed development on the landscape is described in Chapter 10. The proposed development is primarily located adjacent to existing roads and will be completed below ground and as such is integrated into its setting. Landscape and visual effects will be ***imperceptible***, will be ***long-term***, and will be ***neutral.***

Material Assets on:

Population and Human Health
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 13 Material Assets) have assessed the capacities of the available infrastructure to accommodate the proposed development and the implementation of the mitigation measures proposed will ensure there are no negative impacts on the local population. The predicted effect is therefore ***imperceptible*** to ***not significant*** and ***neutral***.

15.4 SUMMARY

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***.