ARUP

Google Ireland Limited

Data Centre Development DC3

Main Environmental Impact Assessment Report

Reference: EIAR Chapter 1 - 3

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Ove Arup & Partners Ireland Limited
50 Ringsend Road
Dublin 4
D04 T6X0
Ireland
arup.com

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1. Glossary

Air Pollution Information System (APIS)

Air Quality Standard (AQS)

All Ireland Pollinator Plan (AIPP)

Alluvium (A)

Annual average daily traffic (AADT)

Appropriate Assessment (AA)

Artificial Intelligence (AI)

Bat Conservation Ireland (BCI)

Bat Roost Potential (BRP)

Bathing Water Directive (BWD)

Biodegradable Municipal Waste (BMW)

Building Research Establishment (BRE)

Business as Usual (BaU)

Calculation of Road Traffic Noise (CRTN)

Catchment Flood Risk Assessment and Management Study (CFRAMS)

Catchment management units (CMUs)

Category 4 Screening Levels (C4SLs)

Central Statistics Office (CSO)

Chartered Institute of Ecology and Environmental Management (CIEEM)

Circular Economy (CE)

Circular Economy Action Plan (CEAP)

Civil Engineering Standard Method of Measurement (CESSM)

Clean Air for Europe (CAFE)

Climate Action Plan (CAP)

Climate Neutral Data Centre Pact (CNDCP)

Cloud Infrastructure Services Providers in Europe (CISPE)

Commission for Regulation of Utilities (CRU)

Conceptual Site Model (CSM)

Conservation Objectives (COs)

Construction Environmental Management Plan (CEMP)

Construction Industry Research and Information Association (CIRIA)

Construction Noise Thresholds (CNT)

Construction Traffic Management Plan (CTMP)

Core Sustenance Zone (CSZ)

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County Development Plan (CDP)

County Geological Sites (CGS)

Data Centre (DC)

Department for Environment and Rural Affairs (DEFRA)

Department of Enterprise, Trade and Employment (DETE)

Department of Environmental Heritage and Local Government (DoEHLG)

Department of Housing, Local Government and Heritage (DHLGH)

Department of the Environment, Climate and Communications (DECC).

Design Manual for Roads and Bridges (DMRB)

Diesel Range Organics (DRO)

Digital Terrain Model (DTM)

Dissolved Oxygen (DO)

Dublin Metropolitan Area Strategic Plan (MASP)

Eastern and Midland Regional Assembly (EMRA)

Eastern and Midlands Waste Region (EMWR)

Ecological Clerk of Works (ECoW)

Ecological Impact Assessment (EcIA)

Edge Distance (ED)

Electric Vehicle (EV)

Electrical Conductivity (EC)

Electrical Yard (EYD)

Electricity Supply Board (ESB)

Emergency Action Plan (EAP)

Emergency Response Team (ERT)

Emissions Trading Scheme (ETS)

Energy Management System (EnMS)

Environmental Clerk of Works (EnCoW)

Environmental Impact Assessment (EIA)

Environmental Impact Assessment Report (EIAR)

Environmental Incident Response Plan (EIRP)

Environmental Management System (EMS)

Environmental Protection Agency (EPA)

Environmental Quality Standards (EQS)

EU Data Centre Association (EUDCA)

Europe, Middle East and Africa (EMEA)

European Communities (EC)

European Environment Agency's (EEA)

European Monitoring and Evaluation Program (EMEP)

European Union (EU)

Facility Support Area (FSA)

Field Integration & Assembly (FIA)

Fuel Oil Control System (FOCS)

Gas Networks Ireland (GNI)

Generic Assessment Criteria (GAC)

Geological Heritage Areas (GHA)

Geological Survey Ireland (GSI)

Google Ireland Limited (GIL)

Government of Ireland (GoI)

Greater Dublin Drainage (GDD)

Greater Dublin Strategic Drainage Study (GDSDS)

Green Infrastructure (GI)

Green Space Factor (GSF)

Greenhouse Gas (GHG)

Gross Domestic Product (GDP)

Gross Floor Area (GFA)

Gross Value Added (GVA)

Ground Granulated Blast Furnace Slag (GGBS).

Groundwater bodies (GWBs)

Habitats Regulations Assessment (HRA)

Heavy Duty Vehicle (HDV)

Heavy Good Vehicles (HGV)

Hight Voltage (HV)

Industrial Emissions (IE)

Industrial Emissions Licence (IEL)

Information and Communications Technology (ICT)

Information Technology (IT)

Inland Fisheries Ireland (IFI)

Institute of Air Quality Management (IAQM)

Institute of Environmental Management and Assessment (IEMA)

Institute of Geologists of Ireland (IGI)

Integrated Pollution Control (IPC)

Integrated Pollution Prevention and Control (IPPC)

International Standards Organisation (ISO)

Intrusive Lighting Professionals (ILP)

Invasive Non-Native Species (INNS)

Ireland Topographic Maps (ITM)

Ireland's Foreign Direct Investment Agency (IDA)

Irish National Seismic Network (INSN)

Irish Tourism Industry Confederation (ITIC)

Irish Wildlife Trust (IWT)

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Loading Dock (LD)

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Material Recovery Facilities (MRFs)

Material Safety Data Sheets (MSDS)

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Mechanical Yard (MYD)

Megawatt (MW)

Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM)

Mobile Elevating Work Platform (MEWP)

National Biodiversity Action Plan (NBAP)

National Biodiversity Data Centre (NBDC)

National Development Plan (NDP)

National Emission Ceiling (NEC)

National Energy Demand Strategy (NEDS)

National Inventory of Architectural Heritage (NIAH)

National Parks and Wildlife Services (NPWS)

National Planning Framework (NPF)

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Northern Ireland Environment Agency (NIEA)

Office of Public Works (OPW)

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Photovoltaic (PV)

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Regional Policy Objectives (RPO)

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Regional Waste Management Offices (RWMO)

Research and Development (R&D)

River Basin Management Plan (RBMP)

River Hydromorphology Assessment Technique (RHAT)

Rooftop Unit (RTU)

Self-regulatory Initiative (SRI)

Site Waste Management Plan (SWMP)

Sites and Monuments Record for Dublin (SMR)

Site-Specific Conservation Objectives (SSCOs)

Small and Medium Enterprises (SME)

Software as a Service (SaaS)

Soil Recovery Facility (SRF)

Source-Pathway-Receptor (S-P-R)

South Dublin County (SDC)

South Dublin County Council (SDCC)

South Dublin County Development Plan (SDCDP)

Special Area of Conservation (SAC)

Special Areas of Protection (SAP)

Special Conservation Interests (SCI)

Special Protection Area (SPA)

Strategic Environmental Assessment (SEA)

Strategic Flood Risk Assessment (SFRA)

Suitable for Use Levels (S4ULs)

Suitably Qualified Ecologist (SQE)

Surface Water Management Plan (SWMP)

Sustainable Urban Drainage (SuDS)

Til Type (TLs)

Total Organic Carbon (TOC)

Total Petroleum Hydrocarbon (TPH)

Total thermal rated input (MWth)

Transport Infrastructure Ireland (TII)

UK Highways Agency (UKHA)

United Kingdom Economic Accounts (UKEA)

United Nations Economic Commission for Europe (UNECE)

United States Environmental Protection Agency (USEPA)

United States of America (USA)

Variable Speed Drive (VSD)

Verein Deutscher Ingenieure (VDI)

Waste Acceptance Criteria (WAC)

Waste Classification (WAC)

Waste from Electrical and Electronic Equipment (WEEE)

Wastewater Treatment Plant (WWTP)

Water Framework Directive (WFD)

With Additional Measures (WAM)

With Existing Measures (WEM)

World Health Organisation (WHO)

Zone of Influence (ZoI)

Zone of Theoretical Visibility (ZTV)

Non-Technical Summary

1. Introduction

This document comprises the Non-Technical Summary (NTS) of the Environmental Impact Assessment Report (EIAR) for the proposed data storage facilities DC3 (hereafter referred to as the Proposed Development) project on behalf of Google Ireland Limited (GIL) adjacent to the existing GIL Campus located at Grange Castle Business Park South in west Dublin.

The existing GIL Campus consists of two data centres. As such, the Proposed Development would be an extension to the GIL Campus site. Once the Proposed Development is in full operation, approximately 50 additional employees are expected on the GIL Campus site, 25 direct and 25 indirect employees. The Proposed Development, to which the planning application and EIAR relate, is the development of 72,400m^2 data storage facility which will incorporate data halls with associated support areas, a High Voltage (HV) compound, offices and staff facilities, a loading area, mechanical and electrical yards, internal and external utilities, together with ancillary buildings.

This NTS summarises the findings of the EIAR in a clear, accessible format that uses non-technical language and supporting graphics.

Environmental Impact Assessment is a process that examines and identifies the potential environmental effects of a Proposed Development and establishes appropriate design and mitigation measures to avoid, reduce or offset potential effects. Subsequently, the EIAR reports the findings of an assessment of the environmental effects of the Proposed Development.

The purpose of the EIAR is to:

- Describe the baseline conditions before any work has commenced;
- Describe the Proposed Development;
- Describe the assessment methodologies used to assess the potential environmental effects of the Proposed Development;
- Identify, describe and assess environmental issues and any likely significant effects which may rise during the Construction, Operational and Decommissioning Phases of the Proposed Development;
- Identify, describe and assess mitigation measures to reduce or avoid these effects;
- Identify the significant residual effects (if any) which occur after the proposed mitigation measures have been implemented; and
- Identify any cumulative and interactive effects between the various environmental factors as a result of interaction within the Proposed Development or with other projects.

Extensive consultation has been undertaken with the relevant stakeholders during the development of the EIAR. Furthermore, a consultation programme with South Dublin County Council (SDCC) was undertaken which identified areas of particular interest regarding the Proposed Development in the planning process and provided guidance on focus areas for the assessment of effects.

2. Need for the Proposed Development

Google, Inc. was founded in 1998 in the United States of America (USA) and was first listed on the NASDAQ stock exchange in 2004 where it remains a public company to this day. Initially, it focused its attention on providing a 'perfect search engine' for its customers, but since its inception it has broadened its focus and now provides a wide range of web and technology-based products and services.

GIL registered in Ireland as a subsidiary to Google, Inc. in 2012. GIL is now one of Google, Inc.'s largest subsidiaries outside of the USA, currently employing over 9,000 full time staff (including external workforce).

GIL has grown and expanded to incorporate the following business activities:

- A 'site reliability' / engineering team supporting Google, Inc.'s European hosting and search activities;
- Multilingual customer support and editing for Google, Inc.'s AdWords advertising product;
- Online relevancy testing and product support; and
- Shared services to support Google, Inc.'s EMEA operations.

The need for the Proposed Development is firmly established in the context of its essential contribution to Ireland's and the globe's online needs. Data centres form part of the critical infrastructure which help process, store, and distribute huge volumes of information at a significant scale and speed. The number of internet users and their usage has grown exponentially resulting in a global reliance on internet infrastructure.

GIL data centres are the engines behind the digital services that help people and businesses thrive and help keep the internet up and running around the clock. GIL services like Google Cloud, Search, Maps and Workspace (which includes Gmail, Docs, Sheets and more), as well as the ongoing AI innovation, are all powered by data centres. GIL data centres securely store and process data from cloud customers, ensuring the safety and performance of their web applications. By expanding the GIL Campus, the Proposed Development fulfils the need for additional data centres.

The Proposed Development is in substantial compliance with the National Planning Framework, the Government Statement on Data Centres, CRU large Energy Users Connection Policy, relevant Regional Strategies and the South Dublin County Council (SDCC) County Development Plan, as set out in the Planning Report contained within this planning application.

3. Alternatives

Numerous reasonable alternative scenarios for the Proposed Development were considered, including alternative layout designs, alternative individual built elements on Proposed Development and an alternative do-nothing scenario.

No alternative sites were considered for the Proposed Development as the Proposed Development is an extension to the GIL Campus that requires to be co-located with GIL's existing Industrial Emissions licenced data centres on site, the SDCC County Development Plan 2022-2028 identified the area for enterprise and employment uses, and there is adequate power and fibre provision.

Data centre buildings are highly process driven and meticulous in their operation. To facilitate this, these building typologies typically have predetermined layouts nonetheless a number of options were considered through the evolution of the design. Technical alternatives included the consideration of both air and water cooling. Air cooling was selected to minimise water usage on site.

The following elements were considered fundamental to the design and were fixed for all options considered:

- Maintenance of the Zoned Rural Area in the southeast corner of the site;
- Retention and enhancement of 5m landscape buffer along Baldonnel Road, to the south of the site; and
- Provision of a SUDs network with associated swales and attenuation ponds.

The location and layout of the data centre building was deemed to be fixed due to spatial requirements. Generally, the options under consideration had regard to the location of the office spaces, the Electrical Yard and the Mechanical Yards relative to the data centre building.

In accordance with EPA guidance, the range of alternatives can include a 'do-nothing'. The 'do-nothing' scenario has been assessed under all relevant environmental disciplines. In general, in the absence of the Proposed Development, the direct and indirect employment opportunities will not arise. In addition, the do-nothing scenario would limit the data centre capacity required to power the cloud and the digital revolution that is transforming all sectors of the economy.

4. Description of the Proposed Development

The objective of this project is to expand GIL's state-of the-art data storage facility located in the townlands of Aungierstown and Ballybane on a greenfield/brownfield site lying to the south of the existing two GIL data storage facilities on their campus in Clondalkin, Dublin 22. The Proposed Development will have the capability to host the servers required to handle the growth in use of GIL's service. The data storage facility will store, manage and distribute information to individuals, businesses and organisations.

The Proposed Development includes the development of 72,400m^2 data storage facility which will incorporate data halls with associated support areas, a HV compound, offices and staff facilities, a loading area, mechanical and electrical yards, internal and external utilities, together with ancillary buildings. The building gross floor area amounts to 38,115m^2. There are currently 110 employees working either directly or indirectly in the existing campus with approximately 50 additional employees (25 direct and 25 indirect) on the campus once operational. The facility will be developed on a 20.4ha greenfield/brownfield site at the location described above, which is approximately 12.5km south-west of Dublin City Centre, just north of Casement Aerodrome. The Proposed Development will include the following principal functional areas:

Site Infrastructure:

- HV compound;
- Associated and ancillary site development works;
- Security fence and gates required to ensure the security of the facilities;
- Roads, pedestrian and cycle routes required to provide access to the DC3 facilities and connectivity to the pre-existing DC1 and DC2 facilities;
- A cycle/footpath link between Profile Park Road and Grange Castle Business Park Road;
- 2 No. stormwater attenuation ponds;
- 1 No. stormwater attenuation tank;
- Industrial and sanitary wastewater pumping station; and
- Additional landscaping and acoustic screening at the Electrical Yard to the south of the site.

Data Storage Facility:

- Eight data halls with associated support areas;

- Office and staff facilities;
- Mechanical Yards containing all plant and equipment necessary to maintain the temperature, humidity as required to run the facility;
- The trestle and conveyance pipe rack to connect the mechanical yard facilities to the main Data Centre building; and
- Electrical Yard containing all plant and equipment necessary to ensure continuous operativity of the data centre facility in case of failure of the main electrical network power supply.

Refer to Figure 4.1 for the site layout of the Proposed Development.

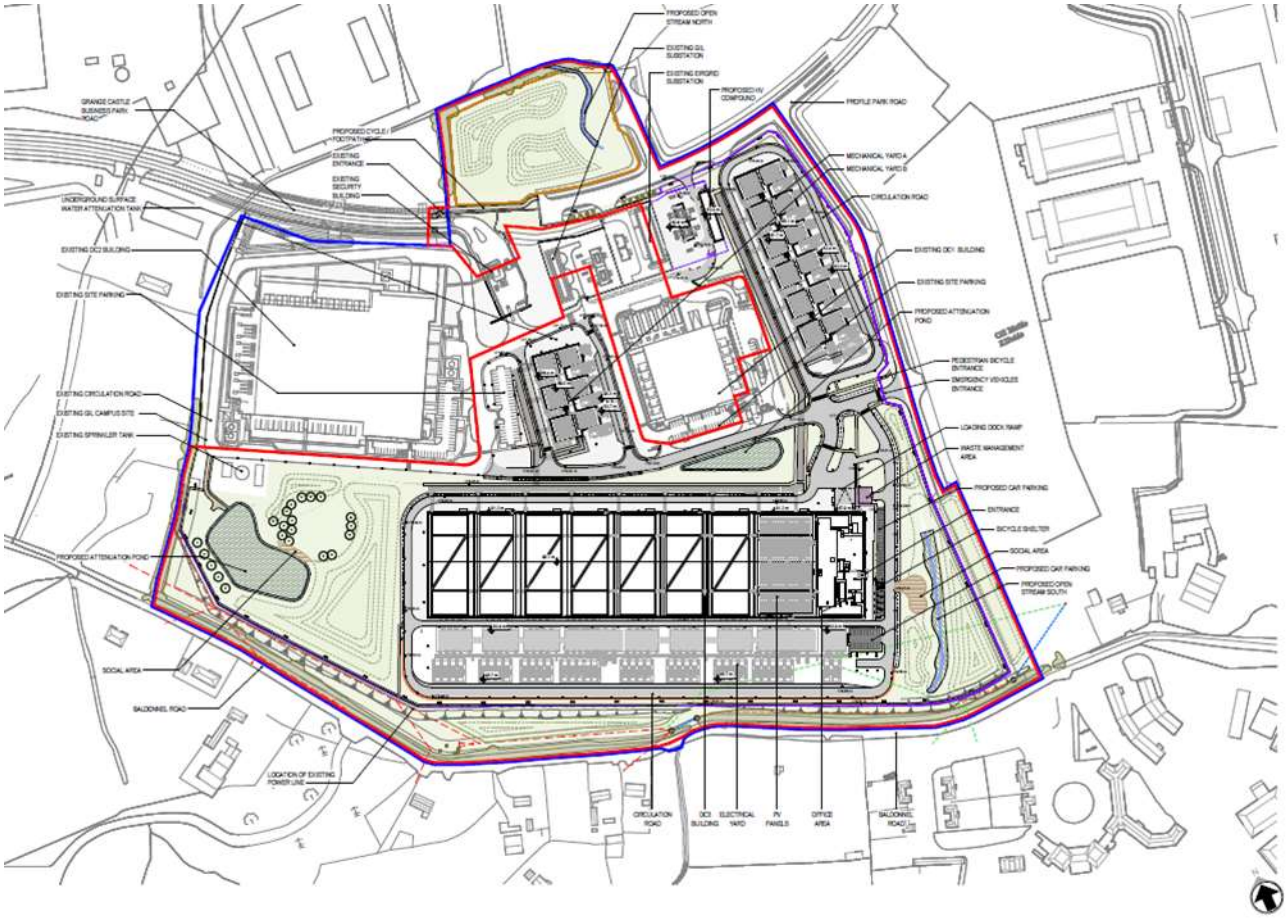

Figure 4.1: Site layout.

A data storage facility is a centralised computer server, information storage and management facility designed and operated for the purpose of storing, managing and distributing electronic information to individuals, businesses and organisations. The facility is used to house mission critical computer systems and networking equipment. As the internet user base increases and the need for more information by existing users focuses on access through the internet, the number of services are increasing as is the amount of data being stored in the "cloud".

The Proposed Development will contain the servers needed to store the information, process the queries and deliver the content that the customer requests. The servers will be connected to the customers through fibre networks from the facility and spreading out from Ireland into Europe and globally.

As outlined in Google's Environmental Report (2023) 2023 Environmental Report (gstatic.com), Google Inc. is working to accelerate the transition to a carbon-free future. In 2021, Google Inc. set its most ambitious goal yet: to achieve net-zero emissions across all of its operations and value chain by 2030. Google Inc. has formally committed to the Science Based Targets initiative (SBTi) to seek validation of the absolute emissions reduction target and the following targets relevant to the Proposed Development were identified in the most recent Environmental report (Google, Inc., 2023):

- Carbon reduction: Reduce 50% of our combined Scope 1, 2 (market-based), and 3 absolute emissions (versus our 2019 baseline) before 2030;
- Carbon-free energy: Run on 24/7 carbon-free energy on every grid where we operate by 2030;
- Water replenishment: Replenish 120% of the freshwater volume we consume, on average, across our offices and data centres by 2030;
- Data centres: Achieve Zero Waste to Landfill for our global data centre operations; and
- Offices: Divert all food waste from landfill by 2025.

Refer to Section 8 of this NTS or Chapter 8 (Climate) of the EIAR for more site-specific sustainability measures.

5. Construction

The design of the Proposed Development has evolved through comprehensive design iteration, with particular emphasis on minimising the potential for environmental effects during Construction and Operation, where practicable. In addition, feedback received from consultation undertaken throughout the alternatives assessment and design development process have been incorporated, where appropriate.

Based on the assumption that planning consent is secured in Quarter 3/4 (Q3/4) 2024, construction works for the Proposed Development will commence in Quarter 4 (Q4) in 2024. The works are anticipated to be undertaken over a period of 27 months, with a completion target of Quarter 2 (Q2) in 2027.

The first stage of construction relates to site preparation and enabling works which includes the following:

- Site establishment;
- Site clearance; and
- Diversion/ removal of utilities.

The second stage is the main Construction Phase which involves the following:

- Sub Phase 1: Earthworks, excavation, foundation & substructure works;
- Sub Phase 2: Superstructure works;
- Sub Phase 3: Façade & fit-out works; and
- Sub Phase 4: Landscaping works.

A Construction Environmental Management Plan (CEMP) has been prepared for the Proposed Development and is included in Appendix 5.1 of this EIAR. Construction traffic will be limited to certain routes and times of day, with the aim of keeping disruption to existing traffic and residents to a minimum. A Construction Traffic Management Plan (CTMP) has been drafted (refer to the CEMP) and will be further developed by the relevant Contractor personnel and presented to SDCC for approval prior to commencement of the construction works. In order to maintain the working hours outlined in Chapter 5 (Construction), the specialist Contractors may require, at certain times, a period of up to one hour before and after normal working hours, to undertake start and close down activities (this would not include works that are likely to exceed agreed maximum construction works noise levels). A number of other sub-plans including Invasive Species Management Plan (ISMP), Surface Water Management Plan (SWMP), Construction and Demolition Resource and Waste Management Plan (CDRWMP) and Environmental Incident Response Plan (EIRP) have been prepared (refer to the CEMP) are included in Appendix 5.1 and will be further developed by relevant Contractor personnel.

Mitigation and monitoring measures have been identified as environmental commitments and overarching requirements which shall avoid, reduce or offset potential effects which could arise throughout the Construction Phase of the Proposed Development.

6. Traffic and Transport

The potential traffic and transport effects associated with the Construction, Operational and Decommissioning Phases were identified, described and assessed.

During the peak Construction Phase period there is estimated to be approximately 494 two-way heavy goods vehicle movements per day. Assuming a 12-hour workday, it is estimated that there will be on average 42 HGV movements to and from the Proposed Development site in the peak hours on the local road network. During the peak Construction Phase period it is also estimated that there will be approximately 660 two-way staff trips to and from the Proposed Development site per day. Typically, construction workers will remain on the Proposed Development site from morning start to evening time which is from 07:00 to 19:00 Monday to Friday and 08:00 to 14:00 on Saturdays. Therefore it is not likely that staff trips to/from the Proposed Development site would coincide with the morning and evening peak in the local network since they will arrive before the AM peak hour and leave after the PM peak hour period. A Construction Traffic Mobility Management Plan provided in Appendix 5.1 will be further developed by relevant Contractor personnel to mitigate car dependence of construction workers. However, to represent a worst case scenario, it is assumed that 20% of the expected staff trips arrive or depart during peak hours. Assuming that staff will all arrive or depart in single occupant vehicles, this scenario results in and additional 66 trips to the Proposed Development site in the morning peak and 66 trips leaving the Proposed Development site in the evening peak.

The assessment of the potential effect of the Proposed Development over the Operational Phase is made by comparing the projected future traffic volumes on links and junctions in the surrounding area to both *"with"* and *"without"* the Proposed Development scenarios. During the Operational Phase, the 25 additional direct staff associated with Proposed Development will follow existing staff start and finish work times. These are based on varying and flexible work start and finish times from 6.30 a.m. to 10.00 a.m. and from 4.00 p.m. to 7.30 p.m. This distributes staff generated travel during the morning and evening commuter peak traffic periods. However, for the purpose of this analysis, a robust assessment scenario is assumed in which up to 70% of staff would arrive during the morning peak traffic hour and depart during the evening peak traffic hour. This would increase peak hour vehicle trips generated by staff by an additional 32 vehicles, on the basis that 90% of staff would travel to and from work as car drivers, with 10% traveling as car passengers, or use public transport or cycle to work.

The residual effects of the construction works are predicted to be Not Significant and Short-term as construction traffic to and from the Proposed Development site will be carried out in accordance with the robust CTMP (Appendix 5.1). The CTMP will ensure that effects on the local road network during construction are minimised. This CTMP will be updated by the relevant Contractor personnel, prior to the commencement of construction.

During the Operational Phase, the Proposed Development will generate additional vehicle trips on the road network within the local vicinity, however, this predicted effect is considered Slight and Permanent. The proposed new pedestrian and cycle link between Profile Park Road and Grange Castle Road is expected to have a Significant Permanent Positive impact on walking and cycling as travel distance by these modes of transport are significantly reduced.

During the Decommissioning Phase, the residual effects of the works are predicted to be similar to that of the Construction Phase, as traffic to and from the Proposed Development site will be temporary and likely run over a shorter period of time than that of the Construction Phase.

A number of mitigation and monitoring measures are included in Chapter 6 (Traffic and Transport) and the CEMP (Appendix 5.1) to ameliorate the effects of traffic and transport during the Construction, Operational and Decommissioning Phases.

7. Air Quality

The potential air quality effects associated with the Construction, Operational and Decommissioning Phases were identified, described and assessed..

The Proposed Development site falls within Zone A (i.e., Dublin) of the Environmental Protection Agency (EPA) air quality zones. The averaged background concentrations were found to be well within the air quality standards for all pollutants in Zone A.

During the Construction Phase, there is potential for direct and indirect effects to arise. Direct effects are likely due to Construction Phase activities. Indirect effects relate to the potential offsite effects associated with construction traffic accessing the site for deliveries, removals of waste and staff.

The direct effect on air quality during the Construction Phase is expected to be Negative, Significant, and Short-Term in proximity to the works. The duration of the works is expected to be 27 months. In relation to indirect effects, predicted change in NO_2, and PM_{10} concentrations, due to the likely changes in Construction Phase annual average daily traffic (AADT) for the nearest sensitive receptor to each affected road link were calculated. Six road links are projected to result in an increase of HGV of greater than 200 (AADT) that required detailed assessment (refer to Section 7.2.3.3 in Chapter 7 (Air Quality)). Predicted concentrations of NO_2 and PM_{10} are in compliance with air quality standards and a Neutral and Short-Term effect is predicted to occur due to Construction Phase traffic.

Air dispersion modelling was undertaken to assess the potential effects of air emissions resulting from the operation (i.e. emergency and testing) of backup generators. All predicted concentrations (NO_2, PM_{10}, $PM_{2.5}$, and SO_2) are in compliance with the limit values set out by the Government of Ireland. Comparing the existing and proposed scenarios, a reduction in ground level concentrations is predicted to occur for NO_2 and PM_{10}, with SO_2 concentrations remaining unchanged. This is due to a proposed reduction in emergency operation of the generators on the full GIL campus. A rating of neutral to moderate positive permanent effects in EIA terms is predicted based on the impact descriptors.

Emissions from the standby diesel generators were also assessed using the UK Environment Agency methodology. No Adverse Significant effects on air quality in EIA terms are predicted based on the UK Environment Agency statistical approach.

The assessment of the potential effect of the Proposed Development on pollutants relating to the protection of vegetation (NO_x and SO_2) found that air quality standards for the protection of vegetation are complied with at the nearest ecologically sensitive site.

During the Decommissioning Phase of the Proposed Development, the potential effects of the Proposed Development on air quality are likely to be similar to those arising during the Construction Phase.

A number of mitigation and monitoring measures are included in Chapter 7 (Air Quality) and the CEMP (Appendix 5.1) to ameliorate the effects of air quality during the Construction, Operational and Decommissioning Phases.

In relation to residual effects, during the Construction Phase no Adverse Significant effects on air quality are likely to arise offsite. Dust deposition monitoring will be carried out to ensure the effectiveness of mitigation. During the Operational Phase, GIL will be required to comply with the requirements of its revised IE licence. This revised licence will be issued by the EPA to reflect the changes arising from the Proposed Development. No Adverse Significant effects on air quality are likely to arise. During the

Decommissioning Phase, the likely residual effects of the Proposed Development on air quality are likely to be similar to those arising as a result of the Construction Phase.

8. Climate

The potential climate effects associated with the Construction, Operational and Decommissioning Phases were identified, described and assessed.

The Irish Climate Futures: Data for Decision Making report, published by the EPA, states that it is expected that weather extremes will become more likely and more frequent with future climate change (Murphy et al., 2019). A noticeable feature of the recent weather has been an increase in the frequency and severity of storms with notable events including Storm Darwin in February 2014, Storm Emma in March 2018, Storm Ophelia in October 2018 and Arwen and Barra in 2021. Heavier historical rainfall events have also been recorded in recent years including heavy rainfall and flooding. A Flood Risk Assessment (FRA) was prepared for the Proposed Development (Appendix 12.1).

The Proposed Development has the potential to generate carbon emissions during the Construction, Operational and Decommissioning Phases.

In relation to climate change vulnerability, the significance conclusion for the Construction Phase indicates that due to the low likelihood and consequence, the potential effect is Not Significant and therefore the significance of the potential effects is at an acceptable level leading to a finding of a Not Significant effect.

The Proposed Development is expected to have a Construction Phase of 27 months approximately and an operational lifespan of 35-40 years for the purposes of the maintenance embodied carbon. The predicted GHG emissions can be averaged over the full Construction Phase to give the predicted annual emissions to allow for direct comparison with annual emissions and targets. In the absence of mitigation, potential effects on climate are predicted to be Adverse, Moderate and Short-Term in EIA terms during the Construction Phase.

During the Operational Phase and in the absence of mitigation, indirect effects on climate are predicted to be Adverse, Minor and Permanent in EIA terms during the Operational Phase. Furthermore, the Proposed Development will be powered through an existing connection as agreed with Eirgrid. CO_2eq emissions will arise indirectly due to energy generated by the national grid to power the Proposed Development site, equivalent to approximately a 0.44% increase in CO_2 emissions relative to Ireland's 2027 projections.

In the absence of mitigation, the Proposed Development is predicted to result in Adverse, Moderate effects in EIA terms. The duration of the effects on climate is considered to be Short-Term.

During the Decommissioning Phase and in the absence of mitigation, the potential climate effects are predicted to be Minor Adverse and Short-Term in EIA terms.

A number of mitigation and monitoring measures are included to ameliorate potential effects on climate during the Construction, Operational and Decommissioning Phases. Operational phase mitigation includes the facilitation of district heating where excess heat is produced, the provision of photovoltaic (PV) panels and a 14 year Power Purchase Agreement (PPA) (with the possibility of a five year extension) for 58 megawatts (MW) of new-to-the grid capacity from the Tullabeg Solar Farm.

In relation to residual effects of climate change vulnerability, no Adverse Significant effects are likely due to the vulnerability of the Proposed Development to climate change during the Construction Phase. In relation to construction activities and materials, the Proposed Development is expected to have an Adverse, Minor, Short-Term effect in EIA terms on carbon and climate, during the Construction Phase. In relation to the Operational Phase, the Proposed Development is expected to have a direct Adverse, Minor, Permanent effect in EIA terms on carbon and climate.

In relation to indirect emissions, the Proposed Development is expected to have an indirect Adverse, Minor, Short-Term effect in EIA terms on carbon and climate during its Operational Phase. The longer-term effects are considered Not Significant due to the ongoing transition to grid decarbonisation. Finally, in relation to the Decommissioning Phase, the Proposed Development is expected to have an Adverse, Minor, Short-Term effect in EIA terms on carbon and climate.

9. Noise and Vibration

The potential noise and vibration effects associated with the Construction, Operational and Decommissioning Phases were identified, described and assessed.

During the Construction Phase, potential noise and vibration effects are considered at the nearest sensitive receptors due to construction activities and construction traffic to and from the site. The highest predicted noise levels will be generated during the site preparation, excavation, and foundation construction stages. No significant vibration impacts are predicted to occur during the Construction Phase as the relevant limits will be complied with.

There will be clear contractual requirements to ensure the appointed construction Contractors comply with appropriate noise limits at the nearest sensitive receptors, therefore no significant noise effects are likely to be experienced at noise sensitive receptors. No significant noise and vibration effects are predicted during the Construction Phase of the Proposed Development from either construction activities or construction traffic following the implementation of mitigation measures.

The primary sources of outward noise from the Proposed Development during the Operational Phase will arise from building services noise and generator noise, either from routine testing or emergency site operations. To reduce operational noise, various mitigation measures have been included in the design of the Proposed Development including acoustic louvres, discharge attenuators, and night-time reduced fan speed.

During normal operation and the testing of generators, predicted noise levels comply with the Industrial Emissions licence noise limits during the day, evening, and night at the surrounding NSRs. Therefore, no additional mitigation measures are suggested or necessary. No significant residual effects on noise and vibration are predicted to arise.

During the Decommissioning Phase, the residual effects are predicted to be similar or less than of the Construction Phase.

10. Population and Human Health

An assessment was completed to determine the potential effects of the Proposed Development on population and human health.

There is the potential for temporary disruption to nearby residents and road users during the Construction Phase of the Proposed Development. These potential Construction Phase effects have been assessed under the assessments of traffic, noise and air quality, and with the implementation of mitigation no Significant Adverse effects on population and human health are expected to arise. A direct Positive, Moderate, Long-Term residual effect on population is predicted to occur as a result of the economic and employment opportunity associated with the Proposed Development.

Approximately 800 temporary direct and indirect construction jobs are expected to be generated during the 27-month Construction Phase of the Proposed Development.

Chapter 12 (Water), Chapter 13 (Land, Soils, Geology & Hydrogeology) and Chapter 17 (Material Assets) do not report any Adverse, Significant residual effects that are likely to result in Adverse Significant effects on human health. On this basis, the potential effect of other environmental hazards associated with the Construction, Operational and Decommissioning Phases of the Proposed Development on human health will be Neutral.

The Proposed Development is expected to have a Positive, Moderate and Long-Term effect on the population of South Dublin County and beyond, through employment generation and improvements to digital infrastructure during the Operational Phase.

The Proposed Development is expected to create a need for a total of approximately 50 additional staff, of which includes 25 highly skilled staff and 25 support staff once DC3 is fully operational in 2027.

The Proposed Development will be required to continue to comply with limits set out in a revised Industrial Emissions licence for the site. By ensuring compliance with the limits set out in the licence, no Significant Adverse effects on human health will arise.

During the Decommissioning Phase, the residual effects are predicted to be similar or less than that of the Construction Phase.

11. Biodiversity

The biodiversity assessment describes the likely significant effects of the Proposed Development on biodiversity, including flora (plants), fauna (animals) and habitats in both the terrestrial and aquatic environment during the Construction, Operational and Decommissioning Phases.

European Sites

The Proposed Development is not within or immediately adjacent to any European sites, also referred to as Natura 2000 sites. However, the Proposed Development is upstream of European sites in Dublin Bay. As such, the nearest European site is approximately 5.8km north-west of the Proposed Development (Rye Water Valley SAC). A total of six European sites were identified within 15km:

- Glenasmole Valley SAC;
- Poulaphouca Reservoir SPA;
- Red Bog, Kildare SAC;
- Rye Water Valley SAC;
- Wicklow Mountains SAC; and
- Wicklow Mountains SPA.

Potential effects on designated Natura 2000 sites (SAC/cSAC/SPA) are specifically addressed in a Report for Screening for Appropriate Assessment and Natura Impact Statement which has been submitted as part of this application (Arup, 2024). This report concluded the following: *"In light of the best scientific knowledge, with respect to the relevant European sites, the sources and pathways for effect, and how these may result in adverse effects on the integrity of identified European sites. With the provision of the identified mitigation measures provided in Section 8, it has been objectively concluded by Arup, through precise and definitive findings and conclusions capable of removing all reasonable scientific doubt that the Proposed Development will not result in adverse effects (directly or indirectly) on the integrity and conservation objectives of any of the QIs/SCIs of the South Dublin Bay and River Tolka Estuary SPA, South Dublin Bay SAC, North Dublin*

Bay SAC and North Bull Island SPA or any other European site, alone or in-combination with other plans and/or projects"

Following the implementation of the mitigation measures proposed, the residual effects is considered Negative, Imperceptible, Unlikely, Short-Term on designated sites.

Following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted effects from the Proposed Development and with the implementation of the mitigation measures proposed, the construction and operation of the Proposed Development will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects. There is no reasonable scientific doubt in relation to this conclusion.

Nationally and Non-Designated Sites

The Proposed Development site is not within or immediately adjacent to any nationally protected sites. There are no Natural Heritage Areas (NHAs) within 2km of the Proposed Development. Nationally designated sites have not been considered as Key Ecological Receptors (KERs) for the Proposed Development.

The Grand Canal proposed NHA (pNHA) is located approximately 1.5km from the Proposed Development but is not hydrologically connected, surface water flows from the Proposed Development into the Griffeen River and into River Liffey, which discharges into Dublin Bay. Due to the lack of connectivity to the Grand Canal pNHA, nationally designated sites have not been considered as KERs for the Proposed Development.

No Annex I habitats were identified within 2km of the Proposed Development and in line with applicable guidance it has not been considered necessary to assess impacts on these sites for the purposes of this EIAR.

Habitats

There were ten habitats recorded within the Proposed Development site. The Proposed Development will result in the permanent loss of existing habitats: watercourse, dry meadows and grassy verges, hedgerow, scrub and treeline. Potential effects that are likely in the absence of mitigation are: changes to hydrology including diversion of flow; Habitat loss; and Habitat degradation. It should be noted these habitats have been included as a KER for their function in supporting the local fauna populations and the connectivity to European sites, therefore indirect effects will result from habitat loss. No Annex I habitats were identified on the area of the Proposed Development and therefore none will be lost as a result of the Proposed Development. Compensation for scrub, hedgerow and treeline vegetation is proposed through the landscape plan which concept is about integration and strengthening existing Green Infrastructure elements, to assist in implementing the objectives of the SDCC County Development Plan such as hedgerow/ scrub/ tree planting and the planting of a new native riparian habitat along the diverted stream along the DC3 building.

Aquatic Species

No fish species were identified from NBDC records within 2km of the Proposed Development. *Gammarus sp*., river limpet (*Ancylus fluviatilis*) and a *Sphaeriidae sp*. were identified within 2km; however, these are not designated under Irish Legislation. White-clawed crayfish (Austropotamobius pallipes) is the only invertebrate species protected under the Wildlife Acts and listed on Annex II and V of the EU's Habitats Directive was returned within the 2km search area. No sign of white-clawed crayfish was recorded during the site visit. It is considered unlikely that protected aquatic species are present on the Proposed Development given the poor connectivity, size and low flow rate of the drainage ditch (also referred to as the tributary of the Baldonnell Stream).

Amphibians

Amphibians are identified as KERs. There was one record of common frog within the NBDC records from 2019 on the Proposed Development site. A single male common frog was recorded during the 5 June 2024 surveys. Given the existing culverted nature of the watercourse, depth (under 30cm) and lack of aquatic vegetation it is likely that common frog utilise the watercourse for foraging. No smooth newts were recorded on the Proposed Development site during the surveys. The watercourse and SuDS pond represent suitable, although suboptimal, breeding habitat for both newt and frog.

Woodland, hedgerow and treelines suitable for hibernating newts and frogs and as frog foraging habitat. Both smooth newt, common frog and their breeding and resting places are protected through the Wildlife Acts.

Bats

The Ecological Impact Assessment Report by Scott Cawley (2019) identified several habitats including hedgerows and treelines within the Proposed Development site and surrounding area were considered to be suitable foraging and commuting habitat for bats. No records of bat roosts were observed on the Proposed Development site. During site visits no bat roosts were found on the Proposed Development site however, four trees were identified with low Bat Roost Potential. Removal of these trees during the Construction Phase may result in the loss of small numbers of roosting bats. Although no signs of these species were recorded within the Proposed Development site, due to their mobile nature and presence of suitable habitat, the effect is therefore considered Significant, on a precautionary basis, in the absence of mitigation.

Chapter 11 (Biodiversity) details the mitigation measures which will be implemented to reduce the impact on bats on the Proposed Development. Through the implementation of the mitigation measures, no Significant residual effect is considered.

Birds

Given the potential for a common assemblage of bird species to utilise the grassland, treeline, hedgerow and scrub for breeding and foraging, breeding birds are identified as KERs. Suitable nesting and forging habitat are present within the Proposed Development site through treeline, hedgerow, grassland and scrub. These also provide connectivity to the wider landscape, specially along the south boundary. Additionally, the NBDC records were reviewed for Annex I bird species. Peregrine falcon often utilise upland and mountainous habitats for breeding and prefer saltmarshes and coastal habitats during winter. Wetland and waterbirds SCIs require access to coastal or riparian habitats. Barn owl (*Tyto alba*) were not listed in NBDC records and no evidence of presence or suitable nesting habitat identified during the survey. It is unlikely that the Proposed Development supports populations of Annex I bird species due to the unsuitability of the watercourse to support wetland and waterbird species, the lack of suitable wintering and summer habitats for species such as merlin, hen harrier and peregrine, there was no other evidence recorded or through NBDC of any Annex I bird species using the Proposed Development site, and the bird spikes on the existing datacentres would also act as a deterrent for perching birds.

In the absence of adoption of protocols for the protection of birds and their nests, there is potential for direct impacts on nesting birds and/or mortality of nesting birds at a local scale, arising from the vegetation clearance, increased noise and human activity during construction. The effect can be described as Negative, Slight/Moderate, Short-Term on the local bird population. It is therefore considered Significant in the absence of mitigation. Mitigation measures such as applying seasonal restrictions on vegetation clearance, tree/ hedgerow planting, provision of nesting boxes and implementation measures detailed in the CEMP will reduce the impact the Proposed Development will have on birds. Therefore, there is no Significant residual effects on birds.

Invertebrates

No protected invertebrate species were identified from NBDC records. There were three near threatened species records: large red tailed bumble bee (*Bombus (Melanobombus) lapidarius*), moss carder-bee (*Bombus (Thoracombus) muscorum*) and a small solidarity bee (*Lasioglossum (dialictus) smeathmanellum*).

Given the lack of desk records and evidence from the survey, this group was not further evaluated.

Other Terrestrial Mammals

Protected mammals identified from NBDC records are pine marten (*Martes martes*) and west European hedgehog (*Erinaceus europaeus*). Scott Cawley recorded otter, west European hedgehog and Irish hare (*Lepus timidus subsp. hibernicus*) within the 2km of the Proposed Development. No signs of these species were noted within the field survey.

The habitats to be affected are common and there is no evidence to indicate that the Proposed Development areas are of particular value for these species in the context of the surrounding countryside, south of the Proposed Development. During the Construction Phase, disturbance and direct mortality from site clearance works are predicted to have a Negative, Slight and Short-Term effect on such mammal species at a local level. However, with the implemented mitigation measures listed in Chapter 11 (Biodiversity) the direct effect on mortality and disturbance of such mammals is Not Significant. Therefore, no significant residual effects will arise.

The retention and enhancement of significant areas of valuable habitats such as scrub, treelines and hedgerows will mean that small mammal species such as hedgehog and pygmy shrew are likely to quickly recolonise the area following construction works. The creation of new semi-natural habitats, including understorey planting, riparian buffers will provide significant areas of cover for small mammals. As part of the management regime, unmanaged areas of scrub will be allowed to develop, providing significant opportunities for small mammals to colonise these areas.

The inclusions of linear features within the existing and proposed areas of the site will ensure that connectivity is retained and improved throughout the construction and operation of the development. The residual effect of the loss of foraging and commuting habitat is predicted to be Neutral, Slight and Long-Term at a local level.

Invasive Species

No Invasive Non-Native Species (INNS) were identified within the Proposed Development site. It is noted that the medium impact invasive species Buddleia, sycamore and pampas grass were recorded on site. This effect can be described as Negative, Slight, Unlikely, and Short-Term across the habitat in the area of the Proposed Development. Although INNS were not identified in the area of the Proposed Development, on a precautionary basis, the potential of INNS to be spread during construction is considered Significant, however the implementation of mitigation measures included in the CEMP (Appendix 5.1) will result in no Significant residual effects.

12. Water

The potential effects of the Proposed Development on surface water and groundwater during its construction, operation and decommissioning were identified, described and assessed.

During the Construction Phase, there is the potential for an increased risk in in-channel flood levels while watercourse works are taking place of up to 50mm which has the potential to result in Negative, Slight and Short-Term effects. A number of risks on surface water quality may arise, however, the potential effects on surface water quality during the Construction Phase are predicted to be Negative, Slight and Short-Term. Potential effects on surface water hydromorphology during the Construction Phase are large but the importance of the watercourse is low. This has the potential to result in a Negative, Slight / Moderate and Short-Term effects.

Potential Operational Phase effects include:

- Potential effects on surface water quality from sediment runoff, spillages, discharges or physical modification;
- Potential effects on groundwater levels and quality;
- Potential effects on hydromorphology from changed flow regime and morphology;
- Potential effects on drainage patterns from working in or near watercourses; and
- Potential effects on flood risk.

Surface water runoff from the drainage systems will be limited to greenfield runoff rates and thus the potential effect on flood risk is Imperceptible and Long-Term. The significance of effects on the groundwater aquifer is Negligible.

The existing culverted watercourse will be rerouted via new culverts and open channel route around the data centre building before rejoining Baldonnell Stream. The new culverts and open stream sections are designed to convey the 1 in 100 year flood event with allowance for climate change. Appropriate freeboard has been provided at the open stream sections. Modelling of a blockage scenario has shown that the increase in levels due to a 33% blockage of the culverts could cause 25mm increase in flood level upstream of the site. This increase is not expected to cause flooding to upstream property.

The effect of the proposed culverts and stream diversion on water levels outside the site boundary has been assessed by hydraulic modelling. In the proposed scenario, water levels upstream of the site (south) are locally reduced on average by 100mm compared to the existing conditions, returning to existing scenario levels 115m upstream.

At the downstream end of the model, water levels locally increase by 30mm directly downstream of the site and return to pre-development (existing) levels 75m downstream of the site. It should be noted this increase in levels is only local and occurs during the 1% Annual Exceedance Probability (AEP) +20% climate change allowance. There is no impact during the 1% AEP.

A blockage scenario of the new culverts was modelled and has shown that the increase in levels during such occasion could cause 25mm increase in flood levels upstream of the site. This increase is not expected to cause flooding to upstream properties.

Based on these potential risks, the potential effect rating on hydromorphology during the Operational Phase is large but the importance of the watercourse is low. This results in potential Negative, Slight / Moderate and Long-Term effects.

As part of the Proposed Development, best practice construction methods will be implemented that will ensure the Construction, Operational and Decommissioning Phases related effects are avoided or reduced to a minimum as much as practicable, including reducing the risk of increase flooding upstream of the site.

As a result of the nature, scale and design of the project and prevention and mitigation measures to be taken, there is not likely to be a significant effect on surface water and groundwater quantity and quality from the Proposed Development. The Proposed Development will not cause a deterioration in surface water or groundwater quality status or compromise the ability of any surface water or groundwater to meet the objectives of the WFD, that there are not likely to be any significant discharges of pollutants from priority or other polluting substances to groundwater or surface water so that the chemical status of the surface water and groundwater will not deteriorate. Moreover, the ecological status of surface waters is not likely to be significantly affected by any discharge to surface waters or water abstraction and there is not likely to be a significant effect on any protected site.

13. Land, Soils, Geology and Hydrogeology

The assessment of the likely effects on land, soils, geology, hydrogeology is underpinned by a Conceptual Site Model (CSM). The CSM was developed based on the desk study review for the regional context and incorporated the ground investigation data for the site specific context.

The likely potential Construction effects of the Proposed Development on the geological and hydrogeological attributes are listed below under the following headings:

- Removal of mineral resources due to earthworks;
- Earthworks resulting in ground instability;

- Mobilisation and exposure to contaminants during earthworks;
- Lowering of groundwater level during earthworks; and
- Pollution of water environment due to earthworks.

No Significant Adverse effects on land, soils, geology, hydrogeology is predicted during the Construction Phase of the Proposed Development.

The likely potential effects on geological and hydrogeological attributes during the Operational Phase are:

- Exposure to contaminants during Operational Phase;
- Lowering of groundwater level due to permanent drainage beneath proposed buildings; and
- Pollution of water environment.

No Significant Adverse effects on land, soils, geology, hydrogeology is predicted during the Operational Phase of the Proposed Development.

Mitigation measures are proposed during the Construction Phase to ensure no Significant Adverse effects arise.

On application of mitigation measures, the identified likely effects during the Construction and Decommissioning Phases would be Imperceptible and Short-Term on all geological and hydrogeological features of concern.

No Significant operational effects are likely to arise.

14. Archaeology, Architectural and Cultural Heritage

The Construction Phase of the Proposed Development involves substantial earthmoving activities comprising topsoil removal, trench excavation and installation of services. The potential for uncovering previously unknown prehistoric sites and settlements as well as later early medieval and medieval farming complexes within the Proposed Development site is therefore high.

The lands forming the subject of this assessment comprises of a substantial greenfield area of mostly undisturbed ground which is considered to be of high archaeological potential given the density of archaeological sites discovered in the townlands of Aungierstown/Ballybane and Kilbride in recent years. Pre-construction mitigation measures to reduce the risk of damage to archaeological sites are included in Section 14.5.1 of Chapter 14 (Archaeology, Architectural and Cultural Heritage). While there are no recorded archaeological monuments within the Proposed Development site and the field survey did not identify any potential visible archaeological monuments, the surrounding area has witnessed several archaeological investigations over the last 30 years. It is possible that previously unknown archaeological features may survive below the surface. The potential for an effect on the archaeological resource would arise therefore during ground works at the initial Construction Phase. Therefore, there is considered to be potential for a Negative, Significant and Permanent effect to arise, in the absence of mitigation and monitoring measures.

The hedgerow marking the townland boundary extending north to south through the centre of the Proposed Development site will be removed during Construction Phase. This will result in a residual direct Negative, Significant and Permanent effect on this feature of cultural heritage significance. However, with the implementation of pre-Construction Phase mitigation measures, no residual effect is predicted.

There are no protected structures or buildings of architectural and cultural heritage merit within the area proposed for the Proposed Development.

The Proposed Development is unlikely to cause any Adverse Significant indirect effects on the curtilage of nearby structures. There will therefore be no Adverse Significant indirect effects on the architectural and cultural heritage resource.

The Construction Phase of any development involves considerable ground disturbance, therefore, the greatest potential effects on the archaeological resource will occur during the removal of topsoil and the reduction of ground levels. It is possible that archaeological features may exist in those areas not tested during the pre-Construction Phase of investigation.

A number of mitigation and monitoring measures are proposed during the pre-Construction and Construction Phases including the provision of monitoring by a qualified archaeologist. The archaeologist will require an excavation licence for archaeological monitoring, to be issued by The National Monuments Service, Department of Housing, Local Government and Heritage and approved by the National Museum of Ireland.

All archaeological and cultural heritage issues will be resolved by mitigation during the pre-Construction Phase or Construction Phase, in advance of the Operational Phase, therefore no Significant residual effects have been identified.

15. Landscape and Visual

There are clear differences between landscape effects and visual effects and the following distinctions have been made:

- **Landscape effects** relate to changes to the landscape as a resource, including physical changes to the fabric or individual elements of the landscape, its aesthetic or perceptual qualities, and landscape character.
- **Visual effects** relate to changes to existing views of identified visual receptors (‘people’), from the loss or addition of landscape features within their view due to the Proposed Development.

Landscape effects and visual effects have therefore been assessed and reported separately.

A series of representative viewpoints have been selected to assess the potential effects of the Proposed Development on landscape and visual amenity with emphasis on ‘worst case’ views wherever possible. This is in line with best practice for landscape and visual impact assessment.

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 landscape effects:

- Landscape effects due to vegetation removal and the site disturbance and from the introduction of new structures, access roads, machinery, materials, storage, associated earthworks, car parking, lighting and hoarding.
- Change of landscape character due to the change in use.

New buildings and a range of associated structures will be established on the site and in the receiving environment. Operational aspects will include daily access & egress by traffic, site management activities, external and internal lighting and development of the proposed landscape. Significant areas of the site are proposed for landscape design measures that includes habitat creation, retention of existing key vegetation, creation of a riparian zone, areas of native woodland, dry meadows, attenuation ponds, swales and augmentation and protection of hedgerows. Due to these aspects, the Proposed Development protects and enhances the green infrastructure on and surrounding the site.

- Landscape impacts due to the introduction of new building & built structures, new roads, mechanical plant and lighting.

- Change in character due to the change in use.

There is the potential for moderate effects on landscape character and on views from the Baldonnel Road in the absence of mitigation measures.

A number of mitigation measures are proposed to be implemented during the Construction and Operational Phases to minimise potential effects including the provision of landscape berms and planting.

Following the implementation of mitigation measures, a negligible residual effect is predicted to arise on landscape during the Operational Phase.

Following the implementation of mitigation measures, a worst-case residual effect of Moderate-Low is predicted to arise on the visual character during the Operational Phase.

16. Resource and Waste Management

The management of resources and the potential for waste to be generated during the Construction, Operational and Decommissioning Phases of the Proposed Development were identified, described and assessed.

The legislative context implements the waste hierarchy, which promotes waste prevention, re-use and recycling over disposal. More recently, the principles of the circular economy have become embedded in legislation, to maintain materials and resources in the economy for as long as possible to minimise waste.

Surplus materials are likely to be generated during the following activities:

- Excavation: excavation of below-ground material such as soil and stones;
- Construction: materials generated from and in relation to the construction of new buildings / infrastructure, general municipal wastes will be generated during the operation of the Proposed Development, minor volumes of maintenance waste will be generated during the Operational Phase of the Proposed Development, small quantities of municipal waste will be generated by construction workers during the Construction Phase of the Proposed Development, segregation facilities may be provided, where necessary on the construction site to ensure that recovery and recycling of such wastes is maximised and small quantities of green waste will be generated from site clearance works during the Construction Phase of the Proposed Development;
- Operation: municipal waste generated from the operation of commercial uses within the Proposed Development and maintenance activities; and
- Decommissioning: waste will also be generated at the end of the Proposed Development's lifespan during any decommissioning works, the waste will be generated in particular from the decommissioning of the Data Centre building and ancillary infrastructure, such as the office block, loading dock, mechanical yards, the electrical yard, elevated ductworks conveyor system.

In total, it is estimated that approximately 532,860 tonnes of material will be excavated to facilitate construction of the Proposed Development which will be exported from the Proposed Development site for offsite treatment and/or management. This is a small proportion of such waste generated in Ireland every year, and there is enough capacity to manage this waste. The construction materials needed for the project are readily available and will have a minimal impact on the environment. The main type of waste expected during construction will be surplus soil, clay and rock. Where appropriate, suitable soil and rock will be reused within the site, and measures will be taken to recycle and manage all waste streams. No significant negative effects on resources and waste are predicted as a result of the Proposed Development. A suite of mitigation measures will be implemented by the PSCS and the appointed construction Contractors, and a Construction and Demolition Waste Management Plan (CDRWMP) (Appendix 5.1) has been prepared to manage it properly.

The Construction, Operational and Decommissioning Phases of the Proposed Development are not predicted to give rise to any Significant residual effects with the adoption of sustainable resource and waste management principles. Nonetheless, appropriate mitigation measures have been identified to further ensure that the sustainable resource and waste management principles including circular economy principles related to the use of resources and adherence to the waste hierarchy, are implemented.

17. Material Assets

The management of material assets during the Construction, Operational and Decommissioning Phases of the Proposed Development were identified, described and assessed.

During the Construction Phase, temporary connections to power supply, telecommunications, water supply, foul water discharge and stormwater discharge will be required. No significant demand is likely and no Significant Adverse effects on these Material Assets are likely to arise.

Mitigation measures will be implemented to minimise increased runoff and sediment loading occurrences as well as contamination of local water courses as outlined in the CEMP (Appendix 5.1).

The Proposed Development will be important infrastructure which will assist in enabling an open modern economy, facilitating digital transformation and associated productivity and competitiveness gains in Ireland. By responding to increasing digital demands, the Proposed Development is expected to result in Positive, Moderate and Long-Term effects on the telecommunications provision.

The Proposed Development will operate under an updated IEL and as such will have prescribed Operational Phase monitoring measures set by the EPA. These controls and monitoring measures must be complied with by GIL in order to operate.

The Proposed Development includes the installation of a new HV compound to support DC3. The existing power grid connection with Eirgrid is sufficient to operate the full campus including DC1, DC2 and DC3.

The design of the Proposed Development includes measures to partially the effects caused by the increased demand on power required during the Operational Phase. These measures include roof-mounted photovoltaic (PV) panels for on-site renewable energy, GIL's new-to-the-grid 14 year Power Purchase Agreement (with the possibility of a 5-year extension) with Tullabeg Solar Farm, and design features of the Proposed Development which will facilitate district heating.

It is expected that the activities carried out during the Decommissioning Phase will replicate those activities in the Construction Phase. As such, similar potential effects have been identified. The mitigation measures for this Phase would follow those outlined in Chapter 17 (Material Assets) for the Construction Phase.

18. Major Accidents and Disasters

Major accidents and/or disasters are hazards that have the potential to affect and be affected by the Proposed Development. An assessment was carried out of the likely effects on the environment, arising from the vulnerability of the Proposed Development to the risk of a major accident or disaster. The assessment of major accidents and disasters reported in this Chapter considers the occurrence of extreme and highly unlikely incidences. As such, it considers accident scenarios that would not reasonably be covered by the specialist topic chapters.

17 no. potential risks were identified with regard to the Proposed Development. 13 no. potential risks were associated with the Construction Phase, and 4 with the Operational Phase. The assessment concluded that any potential effects which could arise during the Decommissioning Phase are likely to replicate those in the Construction Phase.

The potential risks relevant to the Construction Phase include: contamination of water bodies (including surface and groundwater); flooding; structural collapse; electrical shock, release of asbestos fibres, transport incidents related to construction traffic and the proximity to Casement Aerodrome; tree collapse on utilities; spread of invasive species; and explosion/ fire incident.

Possible causes of such incidents include employee negligence, spills, extreme weather, faulty equipment, vibration, collisions, strikes, interaction with unknown infrastructure, disturbance of unidentified materials, contractor error and more.

The potential risks relevant to the Operational Phase include: fires/explosions; transport incidents due to the proximity of the site to Casement Aerodrome; flooding; and structural damage/ collapse. These may be due to spills or leaks, faulty equipment and more.

The risk assessment registered that any potential effects which could arise during the Decommissioning Phase are likely to replicate those in the Construction Phase.

All of the potential risks identified during the construction, operation and decommissioning were classified as low to medium risk. The scenarios with the highest risk relate to the contamination of water courses (surface and ground water), risk of explosion/ fire, biosecurity, risk of structural damage/ collapse, and a risk of transport collisions.

GIL operates stringent emergency response plans and is required to undergo monitoring measures under the conditions of the site's Industrial Emissions licence. Given the existing controls and monitoring measures in place, the standard best practice construction measures to be implemented by the Project Supervisor Construction Stage (PSCS) and the appointed construction Contractors and the stringent procedures and plans, which are currently in operation within the GIL Campus, no plausible major accidents or disaster hazards were identified to which the Proposed Development will be vulnerable.

Aside from the monitoring measures to be carried out by the PSCS and the appointed construction Contractors as outlined in the CEMP (e.g., site inspections and audits) (Appendix 5.1) and throughout the EIAR, no additional monitoring is considered necessary during the Construction Phase of the Proposed Development.

Aside from the monitoring measures to be carried out in accordance with the GIL Campus Industrial Emissions licence, no additional monitoring is considered necessary during the Operational Phase of the Proposed Development.

19. Cumulative Effects and Environmental Interactions

In general, no additional residual cumulative effects have been identified other than those outlined in the individual assessment chapters. However, there is the potential for additional Significant residual effects on climate, resource and waste management and noise during the Operational Phase of the Proposed Development when considered cumulatively with other developments proposed. Additional mitigation measures are described to minimise any Significant residual effects.

While several interactions between various environmental factors have been identified, no significant residual or interactive effects are predicted.

20. References

Google, Inc. (2023) *2023 Environmental Report*

South Dublin County Council (2022) *South Dublin County Development Plan 2022-2028*

1. Introduction

1.1 General

Google Ireland Limited (GIL) is proposing to develop a data centre (DC3) (hereafter referred to as the "Proposed Development") adjacent to its existing GIL Campus located in Grange Castle Business Park South, Dublin 22, in the townlands of Aungierstown and Ballybane, and Kilbride. The existing GIL Campus is comprised of two data centre buildings and the Proposed Development would be an extension to the existing GIL Campus. The location of the Proposed Development is illustrated in Figure 1.1. The Proposed Development site is located southwest of Dublin City and north of Casement Aerodrome.

Ove Arup & Partners Ireland Ltd (Arup) has been appointed by GIL to prepare the planning application for the Proposed Development. In accordance with the Fifth Schedule of the European Union (EU) (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018), an Environmental Impact Assessment Report (EIAR) has been prepared for the Proposed Development as part of the planning application for permission to South Dublin County Council (SDCC). This EIAR should be read in conjunction with all the particulars of the planning application which has been submitted for approval by SDCC under Section 291 of the Planning and Development Act 2000, as amended (the "Planning Acts").

This EIAR is a *"statement of the effects, if any, which the Proposed Development, if carried out, would have on the environment"* (Environmental Protection Agency (EPA), 2022). This EIAR presents the results of a systematic analysis and assessment of the significant effects of the Proposed Development on the receiving environment. It identifies, describes and assesses those effects, in addition to outlining the consideration of alternatives, consideration and assessment of likely significant effects, mitigation and monitoring measures to reduce significant adverse effects and assessment of residual effects. It has been prepared in compliance with Council Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU (the Environmental Impact Assessment (EIA) Directive).

This EIAR supports the planning application to SDCC for the Proposed Development, which if granted, will enable the construction, operation, maintenance and decommissioning of the Proposed Development as described herein.

The Proposed Development will consist of a one-storey data centre facility which will incorporate data halls with associated support areas, HV compound, offices and staff facilities, a loading area, mechanical and electrical yards, internal and external utilities, together with ancillary buildings. When combined, the Proposed Development will be approximately 72,400 m^2 in size. There will be approximately 50 staff employed for the operation of DC3 with 25 direct employees and a further 25 employees indirectly supported by the operation of the Proposed Development. The majority of the Proposed Development is situated on land which is zoned for "*Enterprise and Employment (EE)*" with the small quadrant within the southeastern boundary of the GIL Campus zoned for "*Rural (RU) to protect and improve rural amenity and to provide for the development of agriculture*" under the County Development Plan (CDP). The SDCC CDP was subject to Strategic Environmental Assessment (SEA), Appropriate Assessment (AA) and Strategic Flood Risk Assessment (SFRA).

The GIL Campus is located in a predominantly industrial setting with Grange Castle Golf Club to the east, industrial developments to the west and Casement Aerodrome to the south and southwest. The Proposed Development site is located within the Inner Horizontal Surface of Casement Aerodrome, north of the take-off and approach flight zone (SDCC, 2022).

The existing GIL Campus currently operates under Industrial Emissions Licence (IEL) Reg. P1189-01. However, the IEL will be required to be reviewed and extended to include the Proposed Development. The existing IEL is unaffected by the Proposed Development.

This Chapter provides an outline of the Proposed Development and summarises the statutory consent process. Information is presented on GIL and a summary of the consultations which have been carried out by GIL to date. In addition, information on the competent experts who prepared the EIAR is included in Appendix 1.1.

The design of the Proposed Development has evolved through comprehensive design iteration, with particular emphasis on minimising the potential for environmental effects, where practicable. In addition, feedback received from consultation undertaken throughout the alternatives assessment and design development process have been considered, where appropriate.

The aim of the Proposed Development when in operation is to offer expanded compute capacity to GIL's customers and products. The Proposed Development is described in detail in Chapter 4 (Description of the Proposed Development) and Chapter 5 (Construction) describes the construction methodologies.

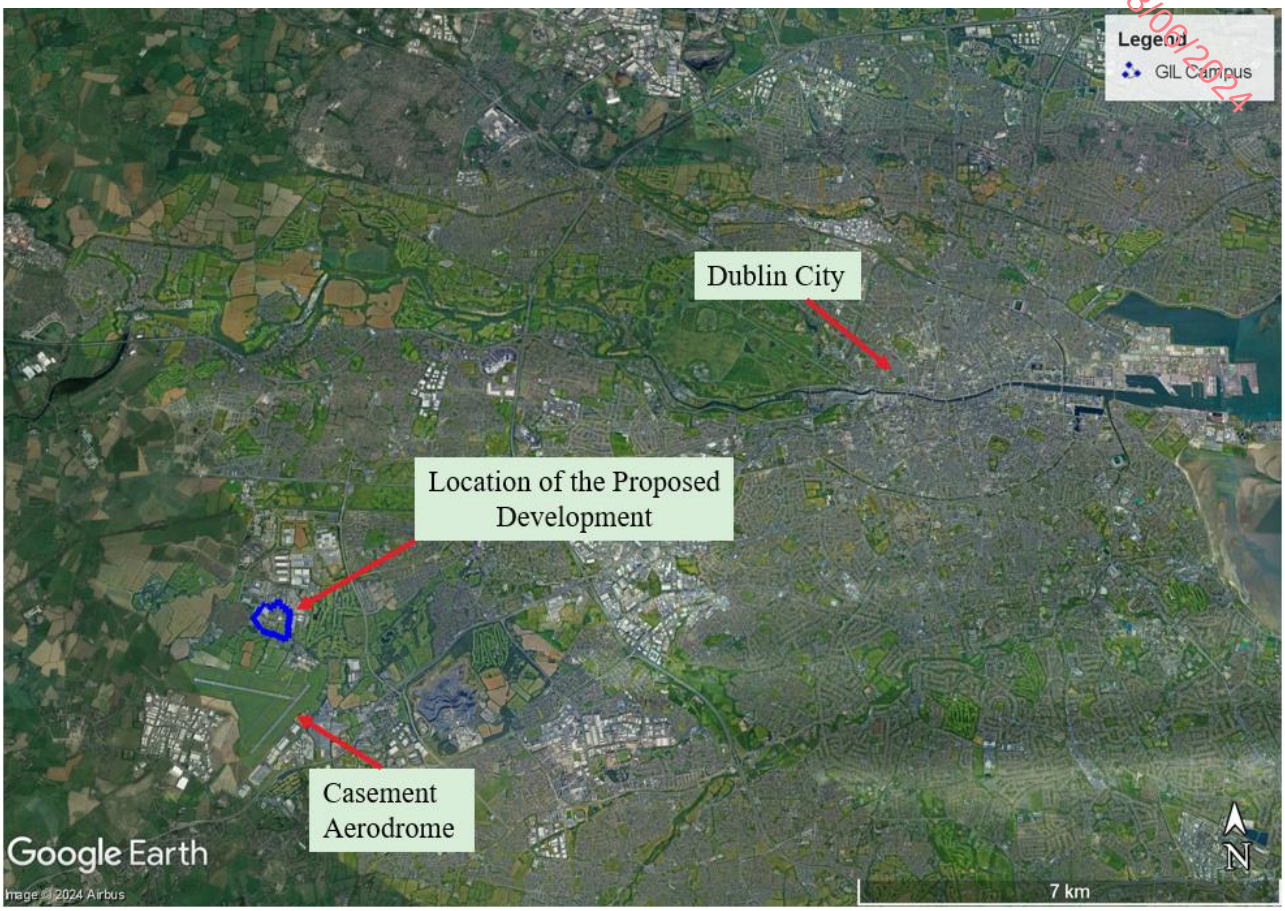

Figure 1.1: Location of the GIL Campus. Source: Google Earth.

1.2 Google Ireland Ltd (GIL)

1.2.1 Introduction

Google, Inc. was founded in 1998 in the United States of America (USA) and was first listed on the NASDAQ stock exchange in 2004 where it remains a public company to this day.

Initially, it focused its attention on providing a 'perfect search engine' for its customers, but since its inception it has broadened its focus and now provides a wide range of web and technology-based products and services.

The company's headquarters are in Mountain View, California, USA. Presently, the company employs more than 180,000 employees in more than 70 offices across more than 40 countries across the globe.

In 2003, Google, Inc. opened its Europe, Middle East and Africa (EMEA) headquarters in Dublin, initially employing five people. Continuing investment has meant the Irish operation now employs 9,000 full time staff (including external workforce). GIL registered in Ireland as a subsidiary to Google, Inc. in 2012. Alphabet, the parent company of Google, Inc., has invested over 1.5 billion Euro in Ireland between the years 2018-2022 (RTE News, 2022).

The investments allowed Google, Inc. to meet the increasingly diverse needs of its growing number of customers (both users and advertisers) in over 35 countries across the (Europe, Middle East, and Africa) EMEA region. GIL's original mandate included a European Data Centre, Multilingual Editing, Customer Support activities and Financial Shared Services. The Irish operation has grown and expanded to incorporate the following business activities:

- A 'site reliability' / engineering team supporting Google, Inc.'s European hosting and search activities;
- Multilingual customer support and editing for Google, Inc.'s AdWords advertising product;
- Online relevancy testing and product support; and
- Shared services to support Google, Inc.'s EMEA operations.

Google, Inc. prides itself on operating sustainably and empowering individuals to make sustainable choices by giving users the tools to make behavioural changes which help to reduce their carbon emissions. Google, Inc.'s most recent Environmental Report for 2022 (Google, Inc., 2023) found that an estimated 1.2 million metric tonnes of carbon emissions were avoided through Google Maps usage worldwide. The report also stated that 113 billion kWh of energy cumulatively was saved by customers from 2011 to 2022 by using Google, Inc.'s own Nest thermostats. Through influencing behavioural changes in users on platforms and clean energy agreements and recycling materials for products, Google, Inc. has stood out as an industry leader in sustainability due to its ambitious sustainability plans (Whittaker, 2022).

1.2.2 Google Inc.'s Commitment to Environmental Principles

At a global and corporate level, Google, Inc. has made a series of sustainability commitments as a business. An example of this is Google, Inc.'s goal to achieve net-zero emissions across all operations and value chain by 2030. Google reports annually on its environmental sustainability strategy, targets and annual progress towards them. It is important to situate the Proposed Development in this context as a contributor to Google, Inc's corporate sustainability goals. The way in which this will be achieved is set out in more detail in Chapters 4, 8, and 16 of this EIAR.

Google, Inc's environmental objectives are driven by the Google Corporate Sustainability Requirements and their commitment to the Climate Neutral Data Centre Pact (CNDCP), which are described below.

1.2.2.1 Google Corporate Sustainability Requirements

Google, Inc's annual Environmental Reports provide an overview of the company's environmental sustainability strategy, targets and annual progress towards them. The following targets relevant to the Proposed Development were identified in the most recent Environmental report (Google, Inc., 2023);

- Carbon reduction: Reduce 50% of our combined Scope 1, 2 (market-based), and 3 absolute emissions (versus our 2019 baseline) before 2030;
- Carbon-free energy: Run on 24/7 carbon-free energy on every grid where we operate by 2030;
- Water replenishment: Replenish 120% of the freshwater volume we consume, on average, across our offices and data centres by 2030;
- Data centres: Achieve Zero Waste to Landfill for our global data centre operations; and
- Offices: Divert all food waste from landfill by 2025.

1.2.2.2 Climate Neutral Data Centre Pact (CNDCP)

The CNDCP (2021) is a voluntary initiative for service providers and data centre operators to commit to environmental goals. It was set up in 2021 by industry bodies Cloud Infrastructure Services Providers in Europe (CISPE) and EU Data Centre Association (EUDCA) and has become a 'Self-Regulatory Initiative' (SRI) with its achievements recognized and reported to the European Commission on a biannual basis (refer to https://www.climateneutraldatacentre.net/ for details). The 80 signatories, of which Google, Inc. is one, have committed to providing data that will prove they have adhered to the Pact's goals by 2030.

Google, Inc. is currently a fully certified member and, in addition to CNDCP compliance, Google, Inc. continually demonstrate its new build developments are satisfying these requirements. See Appendix 1.2 for the Certificate of Conformity for the CNDCP and Section 8.5.2 for further details.

1.3 Proposed Development Overview

This EIAR concerns the Proposed Development to be located in the south-western region of County Dublin. The Proposed Development planning boundary is shown in Figure 1.2.

The Proposed Development is an extension of the existing GIL Campus and will provide a new data centre building and associated infrastructure.

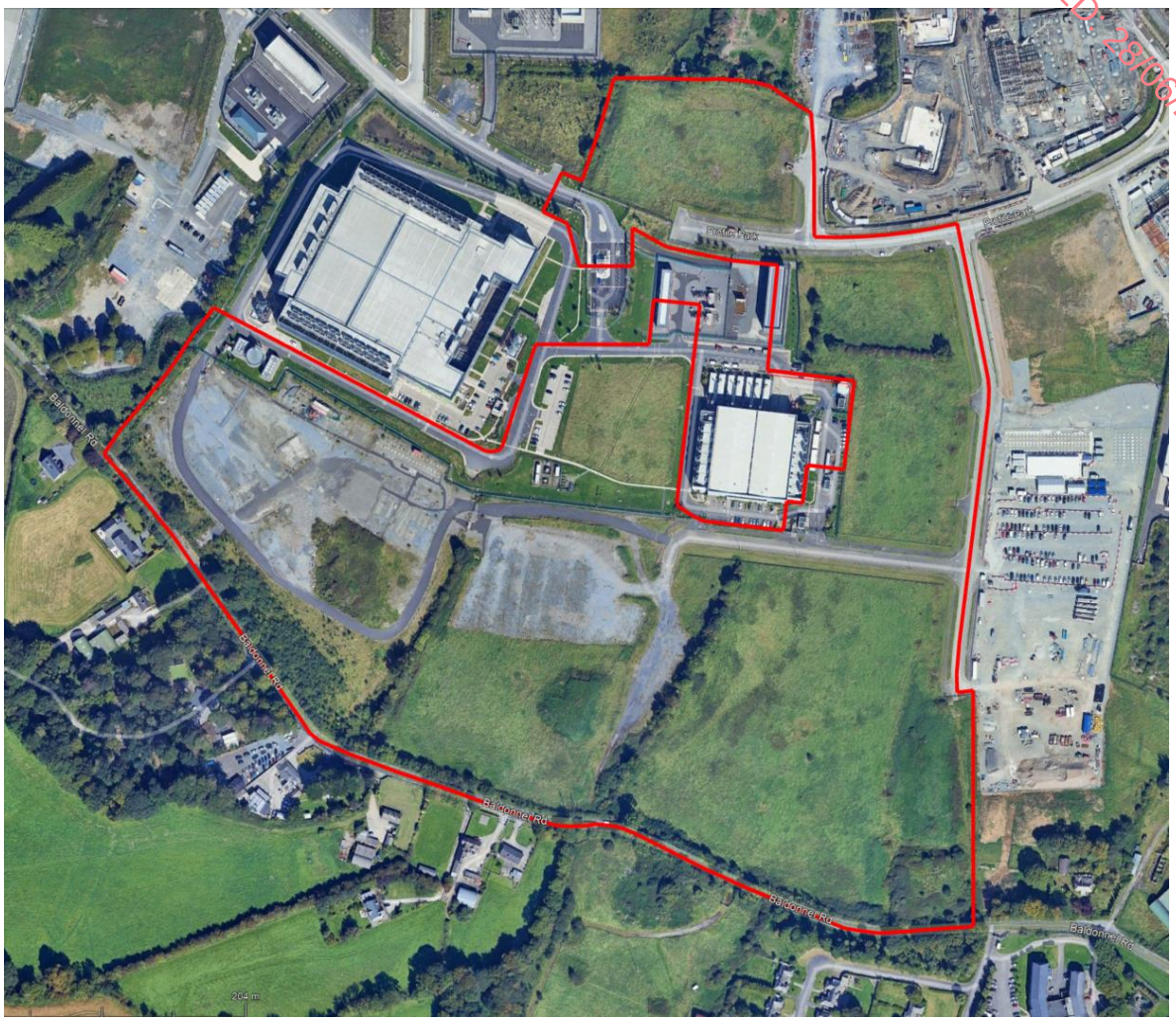

Figure 1.2: Proposed Development planning boundary. Source: Google Earth.

The Proposed Development will be developed on 20.4 hectares (ha) of brownfield and greenfield lands. The surrounding area comprises a small number of residential properties (south), agricultural fields (south and west), industrial facilities to the north, Grange Castle Golf Course to the east and Casement Aerodrome to the south.

The existing GIL Campus data centres are located mainly to the north of the Proposed Development site. DC1 and DC2 were granted planning in 2011, 2014 and 2015 by SDCC (planning reference numbers: SD11A/0121, SD14A/0023 & SD14A/0284). Emissions from DC1 and DC2 are regulated by the EPA under Industrial Emissions Licence P1189-01 which was granted in October 2023. DC1 has been in operation since September 2012 and DC2 since August 2019.

The Proposed Development is intended to create a highly energy efficient data centre building, aligned with industry best practice in sustainability measures.

The Proposed Development will include the following principal functional areas:

Site Infrastructure:

- HV compound
- Associated and ancillary site development works

- Security fence and gates required to ensure the security of the facilities.
- Internal roads, pedestrian and cycle routes required to provide access to the DC3 facilities and connectivity to the existing DC1 and DC2 facilities within the GIL site.
- The existing access entrance for the GIL site will provide access to DC3 as part of the whole campus with no requirement for an additional entrance block. A secondary entrance for construction works and emergency use will be provided to the east.
- Carparking
- A direct foot/cycle path link between Profile Park Road and Grange Castle Business Park Road.
- Two No. stormwater attenuation ponds and one No. stormwater attenuation tank.
- One No. firewater retention tank.
- Industrial and sanitary wastewater pumping station.
- Two No. firewater pumping stations.
- Additional landscaping; and
- Acoustic screening at the Electrical Yard (EYD) to the south of the site.

Data Storage Facility:

- Eight data halls with associated support areas.
- Office and staff facilities.
- Mechanical Yards (MYD) containing all plant and equipment necessary to maintain the temperature, humidity as required to run the facility.
- The trestle and conveyance pipe rack to connect the mechanical yard facilities to the main Data Centre building; and
- EYD containing all generators, plants, and equipment necessary to ensure continuous operativity of the data centre facility in case of failure of the main electrical network power supply.

A MYD, split into two blocks A and B, is proposed to be located north of the data centre building, housing all plants necessary for the functioning of the cooling system, including generators.

South of the data centre hall, an EYD will house external generators for emergency power backup. All of the proposed generators flues height will reach up to 15 metres (m).

The data centre building will connect to the MYDs via a trestle and conveyance pipe rack. One attenuation pond is proposed to accommodate the data centre building, located on the western side of the site. A second attenuation pond is proposed to be located between DC1 and DC3 as shown in Figure 1.3. The Proposed Development site will be protected by a security fence and gates. The existing substation to the north of the Proposed Development site will be expanded with the addition of a HV compound block to the north of the site.

The data centre building will connect to the rest of the GIL Campus via a network of roads, to provide access for workers and visitors, and vehicles for deliveries, maintenance, and part replacements (refer to Figure 1.3). Fire brigade vehicle access will be provided to all buildings. Parking for 42 cars spaces including ten EV charging stations and four accessible spaces are provided for. In addition to the parking provision, it is proposed to provide two electric buggy carts to facilitate access throughout the site and 16 bicycle spaces are accommodated within the design. The carparking provision is located adjacent to the Facility Support Area (FSA) of the Proposed Development as shown in the southeastern quadrant of Figure 1.3.

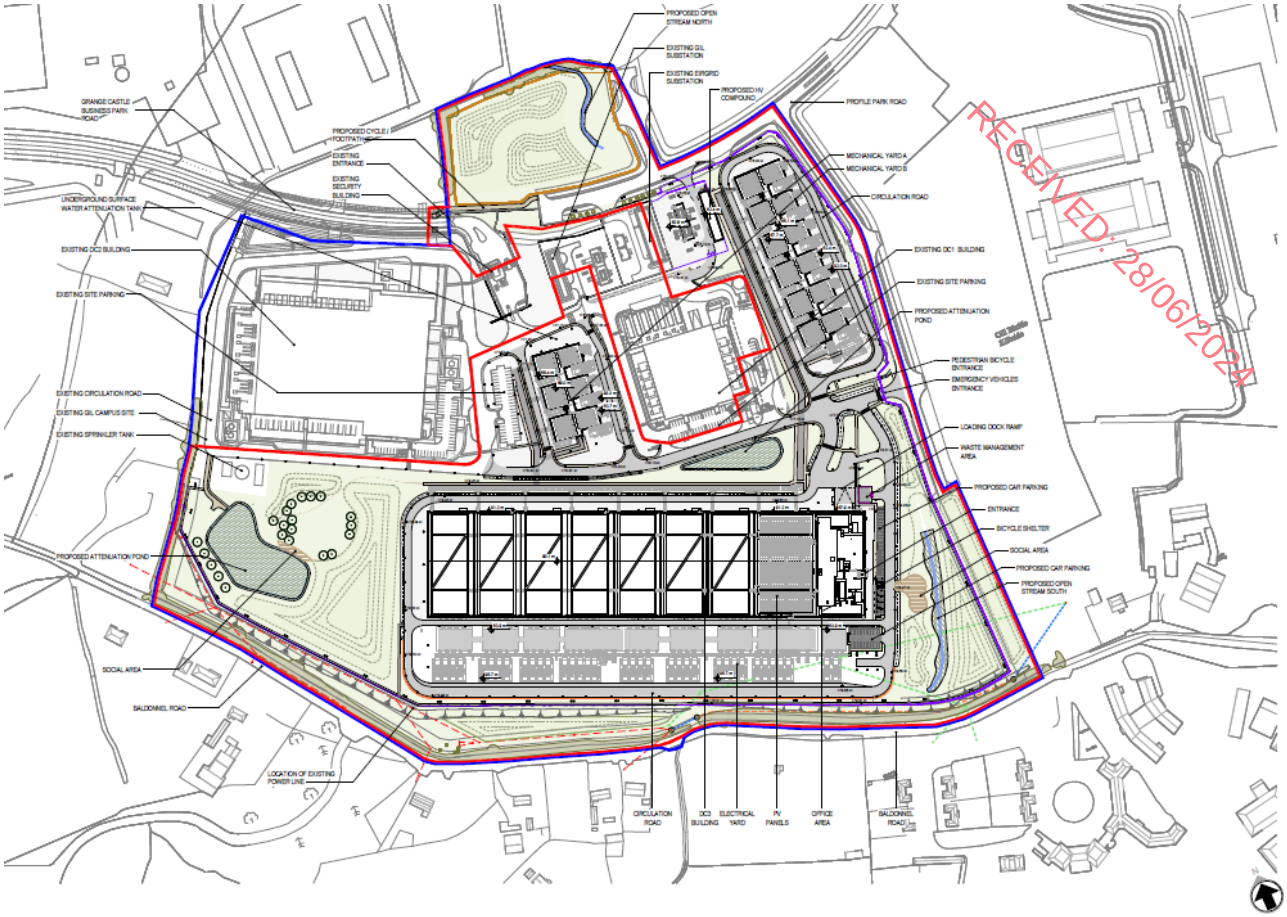

Figure 1.3: Site Layout for the Proposed Development.

1.4 Relevant Legislation

1.4.1 Environmental Impact Assessment

A European Directive for environmental impact assessment (EIA) has been in force since 1985 since the adoption of Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment.

The EIA Directive of 1985 has been amended three times by Council Directives 97/11/EC, 2003/35/EC and 2009/31/EC. It was ultimately codified and repealed by Council Directive 2011/92/EU on 13 December 2011. This Directive was further amended in 2014 by Council Directive 2014/52/EU which sets out the current provisions for member states on the assessment of the effects of certain public and private projects on the environment.

Pursuant to the EIA Directive, the Competent Authority may consider and take account of the EIAR for certain public and private projects that might have significant effects on the environment as part of the consent decision making process. In Ireland, the EIA content in relation to planning consents is set forth in Part X of the Planning and Development Acts 2000, as amended (the PDA) and in Part 10 of the Planning and Development Regulations 2001 as amended.

This EIAR has been prepared in accordance with the EU (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No 296 of 2018), the EIA Directive and also all Irish law and requirements under the Planning Act and Planning Regulations in respect of Environmental Impact Assessment.

Section 172 of the PDA 2000 sets out the requirement for EIA whilst the prescribed classes of development and thresholds that trigger a mandatory EIA are set out in Schedule 5 of the Planning and Development Regulations, 2001, as amended.

Part 1 of Schedule 5 of the Planning and Development Regulations 2001, as amended, defines mandatory projects that require an EIAR and Part 2 of the same schedule defines projects that are assessed on the basis of set mandatory thresholds for each of the project classes.

The Proposed Development comes under Part II of the Fifth Schedule of the Planning & Development Regulations, 2001 which applies to:

"10(b)(iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere".

As the Proposed Development is considered to comprise urban development greater than 10 hectares in other parts of a built-up area, it is mandatory that an EIAR is prepared.

1.4.2 Seveso III Regulations

EU Directive 96/82/EC on the Control of Major Accident Hazards Involving Dangerous Substances (Seveso II Directive) came into force in 1997 and has been implemented into Irish law in under EC (Control of major Accident Hazards Involving Dangerous Substances) Regulations, 2000, S.I. 476 of 2000, as amended. The EU directive was replaced in July 2012 by the Seveso III Directive which was implemented into Irish law under the Chemical Act (Control of major Accident Hazards Involving Dangerous Substances) Regulations 2015, S.I. No. 209 of 2015.

Under current regulations, the Proposed Development is not classified as a Seveso site, and therefore the Seveso III regulations do not apply.

1.4.3 Industrial Emissions Licensing Legislation

The Integrated Pollution Prevention and Control (IPPC) Directive was transposed into Irish law by the Protection of the Environment Act, 2003 and a system of IPPC licensing came into effect on July 12th 2004, which replaced Integrated Pollution Control (IPC) as the licensing regime applicable to certain industrial activities in Ireland.

In 2013, the EU (Industrial Emissions) Regulations (S.I. 138 of 2013), came into force. These Regulations primarily amend the Environmental Protection Agency (EPA) Act 1992 and the Waste Management Act 1996 to transpose Chapters II and VI of Directive 2010/75/EC of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast). The Regulations apply to the industrial emissions directive activities specified in the First Schedule to the EPA Act 1992, as amended by these Regulations.

Activities listed in the First Schedule of the EPA Act 1992 (as amended) and Annex I of the Industrial Emissions Directive (IED) 2010/75/EU) are defined as requiring an Industrial Emissions Licence (IEL). The applicant was granted an IEL by the EPA under the following class of activity IEL:

"Class 2.1: Combustion of fuels in installations with a total rated thermal input of 50 MW or more."

The total thermal rated input (MWth) of the combustion plant at the existing site exceeds 50MWth (24 no. emergency back-up generators and 2 no. fire pump engines). The GIL Campus currently operates under Licence Reg. P1189-01. However, the IEL will be required to be reviewed to include the Proposed Development. Under the EPA "Guidance on Requests for Alterations to a Licensed Industrial or Waste Activity", the Proposed Development will require a review of the IEL as the Proposed Development will "*require[s] a grant of planning permission and was/is subject to EIA by the Planning Authority or An Bord Pleanála*". The existing IEL is unaffected by the Proposed Development.

1.4.4 Emissions Trading Legislation

The EU Emissions Trading System (ETS) was launched in 2005 to reduce greenhouse gas (GHG) emissions through a carbon market. The latest revision of the EU ETS Directive, adopted in 2023, raises overall reductions by 2030 in the sectors covered by the EU ETS to 62 % below 2005 levels. The EPA has responsibility for implementing the ETS in Ireland. Relevant to the Proposed Development, the trading system applies to facilities with:

"Combustion installations with a rated thermal input exceeding 20 MW (except hazardous or municipal waste installations)."

The rated thermal input for the existing GIL Campus exceeds 20 MW thermal input and GIL currently operates under the Greenhouse Gas Permit IE-GHG170-10431-4 which will be required to be updated to accommodate the Proposed Development.

1.5 EIAR Methodology

1.5.1 EIAR Preparation

The primary objective of the EIAR is to identify baseline environmental and socio-economic conditions in the area of the Proposed Development, predict potential beneficial and/or adverse effects of the development and propose appropriate mitigating actions where necessary.

In preparing the EIAR, Arup took into account the following regulations and guidelines:

- Environmental Protection Agency (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (May 2022) (EPA Guidelines).
- Department of the Housing, Planning, Community and Local Government (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.
- Department of Housing, Planning, Community and Local Government (2017) Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licensing Systems; and
- European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report.

Information on the project and the receiving environment was obtained through a number of means including:

- Aerial photographs
- Site visits of the Proposed Development
- Field surveys
- Site investigations of the Proposed Development
- Meetings with SDCC and other stakeholders
- Review of existing data for the general area of the Proposed Development site; and
- Review of previous studies carried out at the Proposed Development site and locality.

1.5.2 EIAR Study Team and Structure

Arup is the Lead Consultant for the front-end design and planning phase of the Proposed Development and fulfilled its role of Project Manager for the preparation of this EIAR. Arup was directly responsible for the preparation of the EIAR Chapters listed in Table 1.1 excluding Chapter 14 (Archaeology, Architectural and Cultural Heritage) which was carried out by Margaret McCarthy Consultant Archaeologist.

Table 1.1: EIAR structure

EIAR Chapter	Chapter Title
Non-Technical Summary	Summary of the EIAR in non-technical language.
1	Introduction
2	Need for the Proposed Development
3	Alternatives
4	Description of the Proposed Development
5	Construction
6	Traffic and Transport

EIAR Chapter	Chapter Title
7	Air Quality
8	Climate
9	Noise and Vibration
10	Population and Human Health
11	Biodiversity
12	Water
13	Land, Soils, Geology and Hydrogeology
14	Archaeology, Architectural and Cultural Heritage
15	Landscape and Visual
16	Resource and Waste Management
17	Material Assets
18	Major Accidents and Disasters
19	Cumulative Effects and Environmental Interactions
20	Summary of Mitigation and Monitoring
21	Summary of Significant Residual Effects
Appendices	Technical reference information supporting the EIAR Chapters

1.6 Format of the EIAR

This EIAR comprises the following elements:

- The Non-Technical Summary. This summarises the findings of the EIAR in a clear, accessible format that uses non-technical language and supporting graphics. The non-technical summary describes the Proposed Development, existing environment, effects and mitigation measures and relevant aspects of the EIAR in a manner that can be easily understood by the general public.
- The substantive EIAR Chapters include introductory chapters in addition to 'assessment' chapters for each environmental aspect in accordance with Article IV of the EIA Directive. The front-end chapters (Chapters 1 to 4) provide the relevant project context whilst the assessment chapters (Chapters 5 to 19) provide a description of the relevant environmental aspects and likely significant effects with summary chapters provided thereafter (Chapter 20 and 21).
- The technical documents that support the EIAR are cross-referenced in the main EIAR Chapters to appendices. The appendices include other relevant drawings, modelling outputs, background reports and/or supporting documents and are included after the EIAR Chapters.

Generally, the structure of the EIAR assessment chapters aligns with both the European Commission EIAR Guidance (2017) and EPA Guidelines (EPA, 2022), and includes the following headings:

- Introduction: Provides an overview of the aims and objectives of the specific chapter in assessing the Proposed Development and outlines the scope of the assessment.
- Assessment Methodology: Describes the forecasting methods and evidence used to identify and assess the significant effects on the environment.
- Baseline Environment: The baseline refers to the current state of environmental characteristics. It involves the collection and analysis of information on the condition, sensitivity and significance of relevant environmental topics which are likely to be significantly affected by the Proposed Development.
- Potential Effects: Reporting in the EIAR is structured to ensure that criteria and standards of significance, sensitivity and magnitude used as part of the assessment are identified and documented and that the level of certainty of data is recorded. An explanation is provided for the assessment criteria that have been applied within each environmental topic area, including reference to the appropriate published guidance.

- Mitigation and Monitoring Measures: This section sets out measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, identifies any proposed mitigation and monitoring arrangements. This section covers both the Construction, Operational and Decommissioning Phases; and
- Residual Effects: Any effects that are predicted to remain after all mitigation measures have been implemented are referred to as 'Residual Effects'. These are the remaining environmental effects of the Proposed Development that could not be reasonably avoided.

1.6.1 Assessment Criteria of Likely Significant Effects

The assessments evaluate the Do-nothing Scenario and the Construction, Operational and Decommissioning Phases of the Proposed Development, with the likelihood, extent, magnitude, duration and significance of potential effects described. The interactions in effects between different environmental aspects and the potential for cumulative effects to arise are also considered. For all environmental topics, the significance of any residual effects remaining are assessed and presented. The assessment criteria used generally follow the European Commission EIAR Guidance (2017) and EPA EIAR Guidelines (EPA, 2022), as reproduced in Table 1.2, unless otherwise stated and described within the relevant EIAR Chapter.

Table 1.2: Description of effects from the EPA Guidelines. Source: EPA, 2022.

Assessment Criteria	
Quality of Effects	
It is important to inform the non-specialist reader whether the effect is positive, negative, or neutral.	Positive Effects: A change which improves the quality of the environment (for example, by increasing species diversity or improving the reproductive capacity of an ecosystem; or removing nuisances; or improving amenities)
	Neutral Effects: No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error
	Negative / Adverse Effects: A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing a nuisance)
Significance of Effects	
'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for the different topics the following definitions may be useful	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 Effects: An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate Effects: An effect that alters the character of the environment in a manner that is consistent with existing and emerging trends
	Significant Effects: An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very Significant Effects: An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment
	Profound Effects: An effect which obliterates sensitive characteristics
Extent and Context of Effects	
Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	Extent: Describe the size of the area, the number of sites, and the proportion of a population affected by an effect
	Context: Describe whether the extent, durations, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Assessment Criteria	
Probability of Effects	
Descriptions of effects should establish how likely it is that the predicted effects will occur so that the Competent Authority can take a view of the balance or risk over advantage when making a decision.	Likely Effects: The effects that can reasonably be expected not to occur because 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
Duration and Frequency of Effects	
Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	Momentary Effects: Effects lasting from seconds to minutes
	Brief Effects: Effects lasting less than a day
	Temporary Effects: Effects lasting less than a year
	Short-term Effects: Effects lasting one to seven years
	Medium-term Effects: Effects lasting seven to fifteen years
	Long-term Effects: Effects lasting fifteen to sixty years
	Permanent Effects: Effects lasting over sixty years
	Reversible Effects: Effects that can be undone, for example through remediation or restoration
	Frequency of Effects: Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).

1.7 Consultation

An extensive programme of consultation was undertaken as part of the preparation of the EIAR. A key objective of the consultations was to identify any particular areas of concern in relation to the Proposed Development as they pertain to individuals, groups or bodies who hold an interest in the project. At the outset of the project, meetings with SDCC were held and the scoping of the contents and the format of the EIAR were discussed.

Below outlines the SDCC departments that were consulted and also any further bodies that were consulted during the EIA process.

The following bodies were consulted in the preparation of the EIAR:

- South Dublin County Council departments:
  - Planning Department
  - Roads Department
  - Water Services Department
  - Parks Department
- Inland Fisheries Ireland (IFI)
- Office of Public Works (OPW)
- Department of Defence
- Grange Castle Management; and

- Dublin Fire Brigade

1.8 Difficulties Experienced during the Preparation of the EIAR

No particular difficulties were encountered during the assessment process.

1.9 References

Climate Neutral Data Centre (CNDC) (2021) *CNDC Pact – The Green Deal needs Green Infrastructure.*

Department of Housing, Planning, Community and Local Government (DHLGH) (2017) *Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licensing Systems.*

DHLGH (2018) *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.*

Environmental Protection Agency (EPA) (2019) *Guidance on Requests for Alterations to a Licensed Industrial or Waste Activity.*

EPA (2022) *Guidelines on the Information to be contained in Environmental Impact Assessment Reports (May 2022) (EPA Guidelines).*

European Commission (2017) *Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report.*

Google, Inc. (2023) *Environmental Report of 2022.*

RTE News (2022) *Alphabet chief says Google will continue to invest in Ireland.*

South Dublin County Council (2022) *South Dublin County Development Plan 2022-2028 and associated Environmental Reports.*

Whittaker, M. (2022) *Google has one of the Big Tech's most aggressive sustainability plans. Here's its 3-step playbook for helping the planet. Fortune Media.*

2. Need for the Proposed Development

2.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) sets out the need for the DC3 data centre development (hereafter referred to as 'the Proposed Development').

The need for the Proposed Development is firmly established in the context of its essential contribution to Ireland's online needs. Data Centres form part of the critical infrastructure which help process, store, and distribute huge volumes of information at a significant scale and speed. The number of internet users and their usage has grown exponentially resulting in a global reliance on internet infrastructure. The increased use of data has enabled industrial and societal development, it allows the provision of services across all sectors of the economy and assists with utilisation of greener technologies. The demand on internet infrastructure is exacerbated by the popularity of artificial intelligence. As a result, additional data centre development is required to support these service requirements. DC3 is proposed to add an additional data centre to complete a total of three at its Google Ireland Limited (GIL) Campus.

The design of the Proposed Development has evolved through comprehensive design iteration, with particular emphasis on minimising the potential for environmental effects, where practicable. In addition, feedback received from consultation undertaken throughout the alternatives assessment and design development process have been considered, where appropriate.

The aim of the Proposed Development when in operation is to offer expanded compute capacity to GIL's customers and products. The Proposed Development is described in detail in Chapter 4 (Description of the Proposed Development) and Chapter 5 (Construction).

Refer to Appendix 1.1 for details of the author of this Chapter.

2.1.1 Need for Data Centre Development

According to the Government Statement on the role of Data Centres in Ireland's Enterprise Strategy (Government of Ireland 2022), *Data Centres are important infrastructure enablers in an open modern economy, facilitating digital transformation of SMEs and associated productivity and competitiveness gains. Data can drive research and innovation and the training of AI systems in areas such as health, transport, agriculture, and the environment.*

It states that *Data Centres represent a core digital infrastructure for both Ireland's and Europe's digital economies and for strengthening Ireland's position as a strategic international location for IT services. This is the infrastructure that lies behind all digital aspects of our social and work lives, including video calling, messaging and apps, retail, banking, travel, media, and public service delivery in areas such as healthcare and welfare.*

Data Centres enable digital economies through hosting critical software and data that allows the world's leading companies to run their businesses, organise their supply chains, pay their staff, and host video conferencing applications. These are the suite of technologies and services that have facilitated the digitalisation of our economy, our work lives and many of the online applications, services and platforms widely used across society. During the pandemic, they enabled business and communities to quickly move to a remote model. Data Centres also host and deliver entertainment and content services into homes.

More broadly however, the Statement describes Data Centres as *the means by which Ireland's major technology companies process and store companies' most sensitive and strategic assets. They are also the means by which they are transitioning their businesses to the cloud, making Ireland critical to their global presence. Investments by technology multinationals in large, long-life assets such as Data Centres further secures the presence of the global technology sector in Ireland.*

GIL Data Centres are the engines behind the digital services that help people and businesses thrive and help keep the internet up and running around the clock.

GIL services like Google Cloud, Search, Maps and Workspace (which includes Gmail, Docs, Sheets and more), as well as the ongoing AI innovation, are all powered by Data Centres. GILs Data Centres securely store and process data from Cloud customers, ensuring the safety and performance of their web applications.

The growth of Data Centre generation fuelled by Artificial Intelligence (AI) has continued to transform how data is stored, processed, managed, and transferred. The use of AI has increased the demand for computing power across Cloud and Edge Data Centres to date. In order to meet the demand generated by AI, Data Centres have had to evolve and adapt, in terms of their design, power infrastructure, and cooling equipment in various unique ways. The Proposed Development has potential to contribute to the growing and increased demand for computing power, as a result of AI.

A study commissioned by Google Inc. (H. Thelle, M., 2024) reported that generative AI will boost economic growth in the coming decade and it can increase productivity and boost Ireland's competitiveness. To capture the next wave of AI benefits across society, Ireland needs to promote commercialisation and secure widespread AI knowledge. This study found that generative AI has the potential to boost Ireland's annual Gross Domestic Product (GDP) by €40-45 billion (bn), amounting to plus 8 per cent (%) GDP in peak year if widespread adoption is achieved. Generative AI is developing faster than previously anticipated, and so the peak economic contribution could come sooner than expected, already in around ten years. These gains come from three sources, including productivity increases from people working with generative AI, freed-up time from generative AI's automation potential and the re-employment of time to other value-creating activities.

Generative AI is most effective in automating knowledge-intensive tasks, such as those carried out in Information Technology (IT) services, finance and business services. However, due to the vast size of Ireland's manufacturing sector (45% of Irish Gross Value Added (GVA)), this sector holds the largest economic potential, whereby generative AI is estimated to boost annual productivity growth by 1.2% at peak and increase value added by around €15-16bn. At present, Ireland is doing well on AI adoption drivers, but trails behind globally on AI innovation capabilities. Current gaps suggest that Ireland is at risk of losing its frontrunner position and needs to focus on strengthening AI-related innovation drivers, such as the build-up of AI-related talent and research (H. Thelle, M., 2024). The Proposed Development has potential to improve Ireland's AI innovation capabilities.

Ireland is home to a significant cluster of digital infrastructure and service providers. Digital infrastructure such as Data Centres underpin our technology sector, which is increasingly Cloud based. Data Centres attract over €1bn of direct investment into Ireland annually and are a key part of Ireland's computer services industry. Ireland's computer services industry generated €134bn of exports in 2020, representing 33% of all Irish exports. The ICT sector employs 140,000 people which is equivalent to 6% of total national employment with 40% growth over the last five years. The computing industry in Ireland supported more than 90,000 jobs in 2020, with these jobs growing at more than twice the rate of overall jobs growth and being amongst the best-paying jobs in Ireland.

A CSO publication, Information and Communications Technology: A Value Chain Analysis 2019 (CSO, 2019), highlights the economic contribution of the Information and Communications Technology (ICT) sector. In 2019, output for the ICT sector amounted to €128bn. Total exports of services from the sector were some €121.4bn from both foreign and domestic firms, with domestic ICT companies exporting 37% of their output. Technology companies invested €46 bn in fixed capital assets in 2019, with Research and Development (R&D) investment of €1.392bn.

The data stored in Irish Data Centres underpins an increasing base of employment intensive businesses. According to Ireland's Foreign Direct Investment Agency (IDA), companies that operate Data Centres in Ireland, such as GIL, account for approximately 16,000 direct employees. However, when contractor numbers are factored in, that number reaches 27,000. Hyperscale and colocation Data Centre providers provide hosting capability to a range of software, services and consumer companies that create tens of thousands of additional jobs here. In many cases, the ability to host data here and use Irish Data Centres to sell product or services is a critical part of their presence in Ireland.

These companies, such as GIL, are responsible for very substantial economic value through payroll taxes, exports, corporation taxes and other expenditures such as capital expenditure, materials and services' inputs sourced in the Irish economy. Data Centre investment and the wider technology multinational company base in Ireland has had a positive and supportive influence on the development of the indigenous technology sector.

Strong, reliable and cost-effective data infrastructure is necessary to maximise the opportunities for Irish businesses from digitalisation. Businesses hosting content and software in the Cloud or adopting a software as a service (SaaS) business model, can seamlessly deliver their services anywhere in the world. This ease of delivery and customer assistance presents export opportunities for Irish technology companies.

Importantly, due to real time communications as a result of data networks, the development and support of international customers can be performed from Ireland.

GIL's investment in the Proposed Development will ensure that GIL will be able to meet the increasing demand for ICT services in Ireland. Without this project progressing, GIL will not be able to provide services to these customers.

2.1.2 Google Inc.'s Commitment to Environmental Principles

At a global and corporate level, Google Inc. has made a series of sustainability commitments as a business. An example of this is Google Inc.'s goal to achieve net-zero emissions across all operations and value chain by 2030. Google Inc. reports annually on its environmental sustainability strategy, targets and annual progress towards them. It is important to situate the Proposed Development in this context as a contributor to Google Inc.'s corporate sustainability goals.

Google Inc.'s environmental objectives are driven by the Google Corporate Sustainability Requirements and their commitment to the Climate Neutral Data Centre Pact.

2.1.2.1 Google Corporate Sustainability Requirements

Google Inc.'s annual Environmental Reports provide an overview of the company's environmental sustainability strategy, targets and annual progress towards them. The following targets relevant to the Proposed Development were identified in the most recent Environmental report (Google Inc., 2023);

- Carbon reduction: Reduce 50% of our combined Scope 1, 2 (market-based), and 3 absolute emissions (versus our 2019 baseline) before 2030;
- Carbon-free energy: Run on 24/7 carbon-free energy on every grid where we operate by 2030;
- Water replenishment: Replenish 120% of the freshwater volume we consume, on average, across our offices and data centres by 2030;
- Data centres: Achieve Zero Waste to Landfill for our global data centre operations; and
- Offices: Divert all food waste from landfill by 2025.

2.1.2.2 Climate Neutral Data Centre Pact

The Climate Neutral Data Centre Pact (CNDCP) is a voluntary initiative for service providers and data centre operators to commit to environmental goals (CNDCP, 2024). It was set up in 2021 by industry bodies Cloud Infrastructure Services Providers in Europe (CISPE) and EU Data Centre Association (EUDCA) and has become a "self-regulatory initiative" (SRI) with its achievements recognized and reported to the European Union. The 80 signatories, of which Google Inc. is one, have committed to providing data that will prove they have adhered to the Pact's goals by 2030.

Google Inc. is currently a fully certified member (refer to Appendix 1.2) and, in addition to CNDCP compliance, Google Inc. continually demonstrate its new build developments are satisfying these requirements.

2.1.3 Local Context

GIL has been in Ireland for more than 20 years and the GIL Campus has been located in South Dublin (Grange Castle Business Park South, Dublin 22) for more than ten years. GIL initially invested in the South Dublin GIL Campus in 2012, then completed the build of a second data centre in 2019 and are now planning a third investment on the GIL Campus. The infrastructure in South Dublin supports GIL's continued activities in Ireland, the growth in demand for GIL Products and the current and future jobs on the GIL Campus in South Dublin. The GIL Campus includes existing infrastructure that will also support the Proposed Development.

As previously discussed, GIL Data Centres are the engines behind the digital services that help people and businesses thrive and help keep the internet up and running around the clock. GIL services like Google Cloud, Search, Maps and Workspace (which includes Gmail, Docs, Sheets and more), as well as the ongoing AI innovation, are all powered by Data Centres. GIL's Data Centres securely store & process data from Cloud customers, ensuring the safety and performance of their web applications.

The Proposed Development on the GIL Campus complies with the 'EE' zoning objective for the Grange Castle Business Park - "to provide for enterprise and employment". The GIL Campus has been established for more than ten years and is supported by the policies and objectives of the (South Dublin) County Development Plan, and the Irish Government.

The Proposed Development is also designed to ensure the development integrates with the wider Grange Castle and Profile Park Architecture. The building massing has been orientated in such a way that the public front of house elements, the facility support area (FSA) has been orientated towards the public realm and adjacent green amenity. The building is a single storey design to reduce the massing and height of the building.

GIL carefully selects the locations for Data Centres to be close to population centres in order to minimise the latency in serving the query and also to minimise the costs associated with transmitting data. The Proposed Development is located in the Dublin area, this area hosts a large number of ICT providers.

Investment in the Proposed Development will ensure that GIL will be able to meet the increasing demand for ICT services in Ireland. Without this project progressing, GIL will struggle to provide services to customers.

2.2 National Planning Policy and Guidance

2.2.1 National Planning Framework

The Government published the National Planning Framework (NPF) on 16 February 2018. It is a national level planning policy document that is designed to guide strategic planning and development for the next 20 years. Among its aims is the promotion of compact and sustainable growth; and providing support in areas of enterprise, innovation, and skills to ensure a strong and robust national economy.

The NPF is the overarching policy and planning framework for the social, economic and cultural development of the country. Together with the National Development Plan (NDP), the two documents present one vision – Project Ireland 2040.

A number of the National Strategic Outcomes and Policy Objectives relate to employment and economic development. These include, *inter alia*:

2.2.1.1 National Strategic Outcome 5

National Strategic Outcome 5 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. It is identified that this will be achieved through:

- *"Supporting entrepreneurship and technology-led start-ups and increasing their survival and growth rates, through expanded activities of the Local Enterprise Offices, EI and competitive calls for regional enterprise collaboration initiatives to provide competitive places for enterprise to grow at local level.*
- *Promoting innovation and its diffusion, through support for firm-level innovation, developing research centres and gateways in key areas of relevance to the regions through SFI and EI, and ensuring our research system in the regions is internationally connected.*
- *Developing challenge-based Disruptive Technologies Initiatives to ensure that we stay at the forefront of technological innovation, market application and commercialisation and can spur the next generation of technology-led enterprises, drawing on R&D activities in the higher education sector and enterprise in the regions.*
- *The development of skills, talent and innovation capacity is a key strategic pillar for the NPF.*

Investment in building and sustaining skills, talent and innovation capacity will be prioritised to promote greater competitiveness and increase productivity at both national and regional levels through developing the skills base necessary to fully exploit digital technologies and sustain innovation and through greater alignment of research endeavour and human capital development between the education and enterprise sectors.

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

Under National Strategic Outcome 5 it is stated in relation to innovation:

"Supporting entrepreneurialism and building competitive clusterings in key sectors and activities through collaborative actions at regional and local level, by realising a significant uplift in the performance of indigenous enterprises in terms of innovation, export potential and productivity, supporting technology-led start-ups and by attracting further investment to the regions."

The NPF further states under National Strategic Outcome 5:

"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. There is also greater scope to recycle waste heat from data centres for productive use, which may be off-site".

In addition to the strategic direction outlined under National Strategic Outcome 5, a number of the National Policy Objectives relate to employment development. These include, inter alia:

2.2.1.2 National Policy Objective 10b:

"Regional and Local Authorities to identify and quantify locations for strategic employment development, where suitable, in urban and rural areas generally."

2.2.1.3 National Policy Objective 11:

"In meeting urban development requirements, there will be a presumption in favour of development that can encourage more people and generate more jobs and activity within existing cities, towns and villages, subject to development meeting appropriate planning standards and achieving targeted growth."

The aims and objectives of the NPF with regard to the Eastern and Midland region are clear in their focus on the importance of sustainable employment provision. There is a clear emphasis on supporting and enhancing the growth of innovation, research and development. Further to this, the development of ICT infrastructure, including Data Centres in Ireland is supported by the NPF. The Proposed Development will support the achievement of these objectives and is in compliance with the principles of the NPF.

2.2.2 Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy (July 2022)

In July 2022, the Department of Enterprise, Trade and Employment (DETE) published the 'Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy' (the Statement).This new and updated strategy seeks to:

"set out the principles that will ensure that the data infrastructure that can be accommodated [within Ireland] contributes positively to our climate and digital ambitions".

It states that:

"these principles will be reflected in energy, enterprise and planning policy, regulatory and other decisions across Government Departments, local authorities, enterprise development agencies and other public bodies."

The Statement emphasises the importance and value of Data Centre development as part of the Irish economy, stating the following:

"Data Centres are core digital infrastructure and play an indispensable role in our economy and society. Data Centres provide the foundation for all almost all online aspects of our social and work lives, including video calling, messaging and apps, retail, banking, travel, media, and public service delivery such as healthcare and welfare."

Data Centres are also described as *"critical to Ireland's economic future, and the success of our businesses"*.

Notwithstanding this, the Statement notes that there are currently limits on further Data Centre development, given the need to complete work to "*upgrade our infrastructure, connect more renewable energy, and ensure security of supply*". As capacity is not available to support all new Data Centre projects, the Statement describes "*the Government's clear preference for [those] Data Centre developments that are associated with strong economic activity and employment; make efficient use of our electricity grid, deliver renewable energy in Ireland"*.

As noted above, the Government expands on the nature of its preference in a series of six *"Principles for Sustainable Data Centre Development"* that *"should inform and guide decisions [by public bodies] on future Data Centre development"*. The following section sets out how the Proposed Development aims to comply with each of the individual principles described in the Statement, and should therefore be considered as a Data Centre development for which the Government has a clear preference.

2.2.2.1 Economic Impact

"The Government has a preference for Data Centre developments associated with strong economic activity and employment. In particular, it favours developments in regional locations, aligned with the NPF and Regional Spatial and Economic Strategies, which will embed the technology sector in locations and communities that can benefit from this investment, employment and spillover effects. In assessing economic impact, the totality of the Irish-based economic impact should be considered and factors such as associated total corporate employment, exports, wage levels, Irish materials/services purchased taken into account. The availability of digital infrastructure should serve our national digitalisation objectives, drive innovation, productivity and skills across our economy aligned to the National Digital Strategy."

Proposed Development Compliance: As detailed in the Government Statement (on page 8), data centre investment and the wider technology multinationals based in Ireland, have had a significant positive and supportive influence on the development of the indigenous technology sector. The ICT sector employs 140,000 people which is equivalent to 6 per cent (%) of total national employment with 40% growth over the last five years. The computing industry in Ireland supported more than 90,000 jobs in 2020, with these jobs growing at more than twice the rate of overall jobs growth and being amongst the best-paying jobs in Ireland. The Proposed Development is expected to have a positive long-term effect on the population of South Dublin County Council (SDCC) through further employment generation. Once the Proposed Development is operational in 2027, approximately 50 additional operational staff are expected to be employed, including 25 direct and 25 indirect staff.

Approximately 800 temporary construction jobs are expected to be provided during the Construction Phase of the Proposed Development. Additional, indirect employment is likely to arise due to the servicing of the construction workers, for example the provision of catering.

See Chapter 10 (Population and Human Health) for further details.

2.2.2.2 Grid Capacity and Efficiency

"The Government has a preference for data centre developments that make efficient use of our electricity grid, using available capacity and alleviating constraints. Data centres should engage collaboratively with the respective system operators to understand capacity availability and required grid services across geographic locations, and where connection can be facilitated, provide grid services such as to best utilise available infrastructure to the benefit all electricity customers. This is in line with the CRU Direction to the System Operators related to Data Centre grid connection processing (CRU/21/124)."

Proposed Development Compliance: GIL have signed a 14 year Power Purchase Agreement (PPA) with Power Capital Renewable Energy for 58 megawatts (MW) of new-to-the grid capacity from the Tullabeg Solar Farm through an existing grid connection. This agreement has allowed the development of a new renewable energy project which was granted planning in 2022 and is currently under construction.

It will add new renewable energy to the grid that GIL's offices and data centres run on, contributing to the decarbonisation of Ireland's electricity system and of their operations. Further details can be found in Chapter 8 (Climate) and Chapter 17 (Material Assets).

2.2.2.3 Renewables and Additionality

"The Government has a preference for data centre developments that can demonstrate the additionality of their renewable energy use in Ireland. Developments should provide clear additionality in renewable energy delivery in Ireland, whether through new generation, repowering or otherwise increasing in-country renewable energy capacity – proportionate to the impact of their energy demand."

Proposed Development Compliance: The design of the Proposed Development enables the future provision of district heating, pending the availability of off taker and adequate critical load, and provides roof mounted photovoltaic panels generating renewable power to the site. Further details can be found in Chapter 8 (Climate) and Chapter 17 (Material Assets).

2.2.2.4 Co-Location or Proximity with Future-Proof Energy Supply

"The Government has a preference for data centre developments in locations where there is the potential to co-locate a renewable generation facility or advanced storage with the data centre, supported by a CPPA, private wire or other arrangement. Where the combination of technologies at a generation facility is built to match the demand capacity factor (e.g. endeavouring to match the maximum import capacity with export capacity), the same infrastructure may be able to assist both demand customers and generation facilities (wind/solar/battery farm). This would make efficient use of grid investments, reduce curtailment and potentially enable significant decarbonisation of the data centre. The Government also encourages the co-location of downstream value-adding activities that can make use of carbon, excess heat and other outputs from the data centre activity, such as for horticultural activities or district heating schemes."

Proposed Development Compliance: See Section 2.2.3 above.

2.2.2.5 Decarbonised Data Centres by Design

"The Government has a preference for data centres developments that can demonstrate a clear pathway to decarbonise and ultimately provide net zero data services. It is expected that data centres will align with the EU Climate Neutral Data Centre Pact energy efficiency and water use targets and set themselves targets to achieve zero carbon electricity use at all hours. System operators will work with large energy users to facilitate accurate hourly emissions reporting, grid carbon-intensity transparency, and allow data centre to optimise computing loads to maximise use of renewables and minimise carbon emissions (as per Action 99 of Climate Action Plan 2021)."

Proposed Development Compliance: The Proposed Development will align with EU Climate Neutral Centre Pact energy efficiency and water use targets by employing measures which reduce emissions, reduce water consumption, strive to achieve zero carbon electricity in the future. GIL is certified under the Climate Neutral Data Centre Pact standard (as verified by Bureau Veritas). Further details on how the Proposed Development endeavours to align with this Principle can be found in Chapter 8 (Climate) and Chapter 17 (Material Assets).

2.2.2.6 Small and Medium Enterprises (SME) Access and Community Benefits

"The Government has a preference for data centre developments that provide opportunities for community engagement and assist SMEs, both at the construction phase and throughout the data centre lifecycle. Data centres should provide benefits for regional locations and their surrounding areas through place-making, community engagement and collaboration with local and regional stakeholders to ensure they offer value to the communities in which they locate. Data centres are also construction projects, built environment and physical investments of scale. By necessity, they have an impact on the geography and communities in their vicinity. Data centre developers should make every effort to minimise the disruption of their construction on these communities."

Proposed Development Compliance: The Proposed Development has been designed with careful consideration of its surrounding context and communities.

While the Construction Phase is expected to generate 800 construction jobs followed by 50 (direct and indirect) Operational Phase jobs, providing a positive economic boost for the surrounding communities, the impacts of the Construction and Operational Phases have been assessed and presented throughout this EIAR.

2.2.3 Commission for Regulation of Utilities Large Energy Users Connection Policy (under consultation)

Under the Climate Action Plan 2023 (CAP23), the Commission for Regulation of Utilities (CRU) was assigned as the lead organisation to *"Complete and Publish [an] Electricity Demand Side Strategy and Implementation Plan"* by Q4 2023, with input from other key stakeholders. As such, the National Energy Demand Strategy (NEDS) Project was initiated by the CRU to provide an overarching framework within which to progress the range of deliverables required to decarbonise economic growth.

As part of this, the CRU is undertaking a review of the processing of new large energy demand connections to the electricity and gas systems. The aim of this review is to provide a pathway for new Large Energy User (LEU) connections to the electricity and gas systems which minimises the impact on national carbon emissions while taking into account capacity of the system in relation to supply of energy and grid infrastructure. This is in response to recent developments such as the Government publication of the Sectoral Emissions Ceilings and the Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy.

Future connection policy considerations include the location of the facility, the ability for large energy demand customers to provide flexibility to the system, and the role of different agencies and organisations in implementing any new policy.

While the policy has not yet been enacted, the design and location of the Proposed Development have taken emerging direction into consideration. Also, in connection with the pretext of the CRU policy, and as mentioned in Section 3.4.2, the Proposed Development is in compliance with the principals of the Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy. Further aligned policy compliance can be found below under regional (Section 3.5.1) and local (Section 3.6.1) assessments. incorporating the future provision of district heating.

2.2.4 Climate Action Plan (CAP) 2024, Government of Ireland 2023

The Climate Action and Low Carbon Development (Amendment) Act (2021 Climate Act) was enacted into national law in July 2021. The 2021 Climate Act commits Ireland, in law, to move to a climate resilient and climate neutral economy by 2050 in alignment with the European Green Deal and includes the requirement to annually revise the Climate Action.

The Government published the first Climate Action Plan in June 2019. The CAP24 is the third annual update to Ireland's Climate Action Plan 2019. The Plan *"builds upon last year's Plan by refining and updating the measures and actions required to deliver the carbon budgets and sectoral emissions ceilings."*

The first carbon budget programme proposed by the Climate Change Advisory Council was approved by Government and adopted by both Houses of the Oireachtas in April 2022. The CAP 2023 then implemented the carbon budgets and sectoral emissions ceilings for the non-ETS sectors.

A key policy of CAP 2024 is to *"ensure that 15% of electricity demand is met by renewable sources contracted under Corporate Purchase Power Agreements (PPAs)"* (DoECC, 2024). In addition, the Plan commits to achieving *"up to 0.8 TWh of district heating installed capacity across both the residential and commercial building stock by 2025, and up to 2.7 TWh by 2030"* (DoECC, 2024).

A key target in CAP 2024 is to reach 50% renewable energy share for electricity in 2025 and 80% by 2030 relative to 2005 levels.

By incorporating the future provision of district heating and by signing a 14 year Power Purchase Agreement (PPA) with Power Capital Renewable Energy (with possibility of a five year extension) for 58 megawatts (MW) of new-to-the grid, the Proposed Development supports the ambitions outlined in CAP 2024.

2.2.5 Ireland's National Digitalisation Strategy, Harnessing Digital - The Digital Ireland Framework, Government of Ireland 2022

Ireland's National Digitalisation strategy, Harnessing Digital - The Digital Ireland Framework, is a high-level national framework to position Ireland as a digital leader, at the heart of European and global digital developments. The Strategy sets out a pathway to drive and enable the digital transition across Ireland's economy and society. It seeks to assist people and businesses to fully realise the benefits of digitalisation. These include more flexible and remote working and new job opportunities; new markets and customers for businesses; more efficient and accessible public services for all; and empowerment and choice in how we learn or participate in social activities. The strategy places a strong emphasis on balance, inclusiveness, security and safety, underpinned by a coherent governance structure and a modern, cohesive, well-resourced regulatory framework. Data centres, along with connectivity and cyber security, are important infrastructure enablers in an open modern economy, facilitating digital transformation of SMEs and associated productivity and competitiveness gains. Data can drive research and innovation and the training of AI systems in areas such as health, transport, agriculture, and the environment. Digital technologies have a vital role to play in enabling decarbonisation including through the gathering and analysis of important data for mitigating and adapting to climate change and protecting and restoring biodiversity and ecosystems. They can also help to unlock carbon emission reductions in hard-to-abate sectors such as buildings, industry, and agriculture – through solutions such as aggregated energy system monitoring and management systems, renewables certification and product passports.

The Framework states that policy needs to ensure the positive benefits for sustainability are maximised and that digital technologies are used in a sustainable manner to ensure the energy and circular economy challenges from digitalisation are aligned with our climate objectives.

It states that data centres *are also, more than ever, a core infrastructure enabler of a technology-rich, innovative economy, which makes Ireland a location of choice for a broad range of sectors and value-added activities, such as business collaboration, online commerce, banking, and supply chain management.*

The Proposed Development represents a core digital infrastructure for Ireland's digital economies and for strengthening Ireland's position as a strategic international location for IT services.

2.3 Regional Planning Policy

2.3.1 Regional Spatial & Economic Strategy (RSES) (2019)

The Eastern and Midland Region covers the administrative areas of twelve local authorities. These are Longford, Westmeath, Offaly, Laois, Louth, Meath, Kildare, Wicklow, Fingal, South Dublin and Dún Laoghaire-Rathdown County Councils and Dublin City Council. The Eastern and Midland Regional Assembly (EMRA) published the RSES in 2019 as a framework for implementing Project Ireland 2040's policy objectives on a regional scale (EMRA, 2019).

The Strategic Vision of the RSES is:

"To create a sustainable and competitive Region that supports the health and wellbeing of our people and places, from urban to rural, with access to quality housing, travel and employment opportunities for all."

The RSES came into effect on 31 January 2020. The RSES sets out a 12-year strategic development framework for the Eastern and Midlands Region, with chapters dealing with strategic vision, economy and employment, environment and climate, infrastructure including responding to climate change, biodiversity, green infrastructure (GI), water and energy and implementation, monitoring and evaluation. The RSES establishes a broad framework for development and the way in which the Region's society, environment, economy and the use of land should evolve.

South Dublin County Council falls under the sub-catchment of "Dublin Region", and the "Dublin City and Suburbs" strategic catchment area. In relation to the Proposed Development location, the RSES states:

"Outside the M50, the Dublin Enterprise Zone in Blanchardstown and Grangecastle in south Dublin have significant capacity for high tech manufacturing, research and development in campus style settings."

Section 6.3 of the RSES 2019-2031 deals with Economic Strategy. The vision for the Region is *"a growth that is sustainable, competitive, inclusive and resilient. This requires the development of a strong economic base that is supported by enterprise, innovation and skills".*

Section 6.3 sets out a number of principles to achieve this vision including *Smart Specialisation, Clustering, Orderly Growth and Placemaking*. All if which align with the development vison for the Proposed Development.

Further, within the RSES, the following Regional Policy Objectives (RPO) are of note:

RPO 6.29:

"Support the development of sites where high-tech and high potential start-ups (HPSU29) can thrive, in conjunction with IoTs and Universities, to create collaborative and innovative growth."

RPO 6.9:

"The Regional Assembly supports the Regional Enterprise Plans to focus on (inter alia):

- *Support a high level of economic success throughout the region by building on local strengths and regional innovation capacity;"*

RPO 8.25:

"Local Authorities shall (inter alia):

- *Support the national objective to promote Ireland as a sustainable international destination for ICT infrastructures such as data centres and associated economic activities at appropriate locations;"*

The Proposed Development (part of the GIL Campus) is located within the environs of an existing business park, Grange Business Park South in south Dublin which is acknowledged in the RSES as having a have significant capacity for high tech manufacturing, research and development in campus style settings. The provision of strong, reliable and cost-effective data infrastructure is necessary to maximise the opportunities for Irish and European businesses from digitalisation. It builds on local strengths and adds to the regional innovation capacity. As such it is considered that the Proposed Development aligns with the RSES.

2.3.2 Dublin Metropolitan Area Strategic Plan (MASP) (2019)

Forming a part of the RSES, the Dublin MASP sets out a 12 to 20-year strategic planning and investment framework for the Dublin Metropolitan area. The MASP is an integrated land use and transportation strategy for the Dublin Metropolitan Area that sets out:

- A vision for the future growth of the metropolitan area;
- Large scale strategic residential employment and regeneration; and
- A sequence of infrastructure priorities.

Under Section 5.8 Employment Generation, the MASP further acknowledges:

"Outside the M50 ring there is potential to re-intensify older industrial estates such as Naas Road/Ballymount, brownfield lands in Tallaght/Cookstown and to provide for high tech and research and development employment at strategic employment hubs such as Dublin Enterprise Zone in Blanchardstown and Grangecastle Business Park, linked to improved bus connections".

Table 5.1 specifically mentions the Proposed Development location (being part of the Grange Castle Business Park) as a strategic development area and identifies the *"Promotion of high tech, manufacturing and research and development in Grange Castle Business Park".*

The role of Grange Castle Business Park in terms of strategic employment development is noted in Table 5.2 of the RSES 2019-2031. It identifies the lands as a strategic development area with employment potential for:

"Space intensive uses e.g. IT, research, pharmaceuticals in a campus style setting".

The Proposed Development will enable the build out of the currently underutilised site to strengthen the employment base for Dublin City and Suburbs and enhance regional enterprise particularly around the fields of innovation, deep technology and ICT. As such the proposal is fully aligned with the above referenced Regional Policy Objectives.

2.4 Local Planning Policy and Guidance

2.4.1 South Dublin County Development Plan (CDP)

The South Dublin CDP (SDCC, 2022) is the statutory planning document that covers the entire South Dublin administrative area. The Plan was adopted in June 2022 and came into effect on the 03 August 2022.

The Proposed Development is located within an area zoned EE (Enterprise and Employment) under the CDP. The zoning Objective EE seeks: *"To provide for enterprise and employment related uses".*

Under the EE zone, the use class of Data Centre is identified as *"Open for Consideration".* This means:

"Land uses that are listed as 'open for consideration' in the land use zoning tables may be acceptable to the Planning Authority subject to detailed assessment against the principles of proper planning and sustainable development, and the relevant policies, objectives and standards set out in this Plan. Proposed uses in this category will be subject to full assessment on their own merits and particularly in relation to their impact on the development of the County at a strategic and a local level. Such uses may only be permitted where they do not materially conflict with other aspects of the County Development Plan."

Offices over 1,000m^2 are also classified as *"Open for Consideration"*. As the Proposed Development would have an office space of 3,210m^2 , this use class is relevant.

A small portion of the site is also zoned RU (Rural and Agricultural), which seeks *"To protect and improve rural amenity and to provide for the development of agriculture".* There is no proposed development of infrastructure in this area, improved landscaping will introduce native trees planting, native meadows and a redirected open stream with riparian buffer.

A detailed review of the CDP has identified many relevant policies, objectives and implementation mechanisms which must be considered for the successful delivery of the Proposed Development. The below sections assess the key policies and provides clarity on compliance.

"The creation of a strong and resilient economic base providing expanded opportunities for employment and facilitating a good quality of life within vibrant and attractive places to live, work, visit and invest."

Of particular importance for the Proposed Development is compliance with *EDE7 Objective 2: Require that space extensive enterprise demonstrates the following:*

- *Strong energy efficiency measures to reduce their carbon footprint in support of national targets towards a net zero carbon economy, including renewable energy generation;*
- *Maximise on site renewable energy generation to ensure as far as possible 100% powered by renewable energy, where on site demand cannot be met in this way, provide evidence of engagement with power purchase agreements in Ireland (PPA);*
- *Sufficient capacity within the relevant water, wastewater and electricity network to accommodate the use proposed;*
- *Measures to support the just transition to a circular economy;*
- *Measures to facilitate district heating or heat networks where excess heat is produced;*
- *A high-quality design approach to buildings which reduces the massing and visual impact;*
- *A comprehensive understanding of employment once operational;*
- *A comprehensive understanding of levels of traffic to and from the site at construction and operation stage; and*

- *Provide evidence of sign up to the Climate Neutral Data Centre Pact.*

2.4.1.1 Summary of Key Principles for Development within Enterprise and Employment Zones

Under *Implementation and Monitoring* section 12.9.2 of the CDP, table 12.27 sets out the Key Principles for development within the Enterprise and Employment Zones. Table 2.1 identifies these principles and confirms the Proposed Development compliance.

Table 2.1: Compliance with key principles for EE zones

Key Principle		DC3 Compliance
Access and Movement	• Major links to and through a site are provided as identified within the County Development Plan or relevant Local Area Plan, Masterplan and / or a determined by a site analysis process and / consultation with the planning authority; • The street network is easy to navigate with a clear hierarchy of streets identifying the function of each street; • Individual streets are designed in accordance with the requirements of the (DMURS) Design Manual for Urban Roads and Streets; • Large areas of parking (in particular staff parking) are located to the rear of buildings and screened from the street. Smaller areas of parking may be located to the front of buildings provided they are well designed (including areas of planting) and do not result in excessive setbacks from the street; • The design and layout of new business parks shall promote walking, cycling and the use of public transport, including adequate provision of cycle and pedestrian linkages.	• Access and movement provisions are provided in alignment with these key principles, within the suite of traffic plans, and further detailed within the Mobility Management Plan submitted with the planning application.
Open Space And Landscape	• Provision of a detailed landscape plan showing site appropriate open space which may include a hierarchy of spaces suited to a variety of functions and activities. The landscape plan will also incorporate GI elements (see GI below); • Important natural features of the site such as trees, hedgerows and watercourses are retained, integrated within the landscape plan and reinforced with the planting of native species; • Natural buffer zones and defensive planting are used to define private space and the use of fencing to the front of buildings is minimised; • Where fences interface with the public domain they should be of a high quality and incorporate elements of landscaping (for screening); • Development within business parks shall maintain and promote a parkland-like setting with high quality landscaping.	• Detailed landscaping plans have been provided in compliance with the key principles. Where principles are largely – but not fully – complied with i.e. retention of all hedgerows, alternative or off-set mitigation measures are presented.
GI	• All development proposals shall be accompanied by a GI Infrastructure Plan, which will normally be submitted as part of the suite of Landscape Plans that are required for a development. Plans shall include the following: – Site location plan showing the development site in the context of the wider GI as shown on the GI Strategy for the County; – Site survey and analysis, identifying existing GI and key assets within the site; – Indicate how the development proposals link to and enhance the wider GI network of the County; – Proposed GI protection, enhancement and restoration proposals as part of the landscape plan, where appropriate, for the site. • Proposals for identification and control of invasive species; • Regardless of development size or type, applicants must submit an overall site summary quantifying and detailing the following: – tree and hedgerow removal; – tree and hedgerow retention;	• GI provisions and connections are provided within the suite of Landscape Plans, and detailed further within the Landscape Architecture Report (which includes the GI Plan) submitted with the planning application.

Key Principle		DC3 Compliance
	– new tree and hedgerow planting. • This information will be submitted in a digital format agreed with the Council to allow amalgamation and reporting on tree and hedgerow.	
Built Form and Corporate Identity	• Building heights respond to the surrounding context with transitions provided where necessary which reinforce the urban structure with taller buildings located along key movement corridors, gateways and nodes; • Individual buildings should be of contemporary architectural design and finish (including use of colour); • Various treatments, finishes and colours should be employed to reduce the bulk, massing and scale of larger buildings; • The layout and design of buildings should maximise frontages onto the public realm and enclose private external spaces (such as service yards and car parks) and storage areas behind them; • Signage should be simple in design and designed to integrate with architectural features and / or the landscape setting (see also Section 12.5.7 Advertising, Corporate Identification and Public Information Signs).	• A Design and Access Statement (DAS) has been developed to support the planning application and is in compliance with all key principles listed, as well as other relevant CDP QDP policies. Height, architectural design, finishes, massing, layout, open spaces and signage are all carefully considered and designed for compliance.

2.4.2 Other Significant CDP Objectives and Implementation Mechanisms

There are several other relevant policies and objectives within the CDP that not only require consideration with the design of the Proposed Development, but also have an associated implementation mechanism to ensure objectives are met. The below Table 2.2 identifies these significant objectives and confirms how the relevant implementation mechanism from Chapter 12 of the CDP (SDCC, 2022) have been developed in support of this application.

Table 2.2: Other relevant policy implementation mechanisms

CDP Objective	Implementation Mechanism Compliance
NCBH5 Objective 2: To ensure that an Ecological Impact Assessment is undertaken for developments proposed in areas that support, or have the potential to support, protected species or features of biodiversity importance, and that appropriate avoidance and mitigation measures are incorporated into all development proposals.	As per IM mechanism 12.3.2 and 12.3.3, an Ecological Impact Assessment accompanies this EIAR.
NCBH14 Objective 4: To require a Landscape / Visual Impact Assessment to accompany all planning applications for significant proposals, located within or adjacent to sensitive landscapes and to provide mitigation measures to address any likely negative impacts.	As per IM mechanism 12.3.5, an LVIA accompanies this EIAR.
GI 1 Objective 4: To require development to incorporate GI as an integral part of the design and layout concept for all development in the County including but not restricted to residential, commercial and mixed use through the explicit identification of GI as part of a landscape plan, identifying environmental assets and including proposals which protect, manage and enhance GI resources providing links to local and countywide GI networks.	As per IM mechanism 12.4.2, a Green Infrastructure Plan has been produced and submitted within the Landscape Architect Report, demonstrating compliance with CDP chapter 4 policies.
GI3 Objective 4: To uncover existing culverts where appropriate and in accordance with relevant river catchment proposals to restore the watercourse to acceptable ecological standards for biodiversity wherever possible improving habitat connection and strengthening the County's GI network.	As per IM mechanism 12.11.1(iii), watercourses should only be culverted when demonstrated as being necessary based on site specific constraints / circumstances. Due to site layout and the location of an existing watercourse, culverting of a small section is required. To ensure no loss of biodiversity, an existing culverted section of the stream will be opened up again, and improved with ecological enhancements and a riparian buffer. Further details are provided in the drawings and Landscape Architecture Report submitted with the planning application.

CDP Objective	Implementation Mechanism Compliance
GI5 Objective 4: To implement the Green Space Factor (GSF) for all qualifying development comprising 2 or more residential units and any development with a floor area in excess of 500m^2 . Developers will be required to demonstrate how they can achieve a minimum Green Space Factor (GSF) scoring requirement based on best international standards and the unique features of the County's GI network. Compliance will be demonstrated through the submission of a Green Space Factor (GSF) Worksheet (see Chapter 12 (Water) Implementation and Monitoring, Section 12.4.2).	As per IM mechanism 12.4.2, the GSF has been considered with the Green Infrastructure Plan. As discussed with SDCC at pre-planning meeting on 14th May 2024, due to the limited green space factors on site, the preferred score cannot be achieved, and therefore alternative site-specific GI interventions or other contributions will agreed with SDCC. Although the Proposed Development largely – but not fully – complies with this policy, any degree of non-compliance is considered minor.
QDP2 Objective 1: To ensure that applications for new development are accompanied by a statement from a suitably qualified person detailing how 'The Plan Approach' has been taken into consideration and incorporated into the design of the development including the materials and finishes proposed and demonstrating how the overarching principles for the achievement of successful and sustainable neighbourhoods have been integrated as part of the design proposal.	As per IM mechanism 12.5.2, the Plan Approach has been developed to consider the eight key principles. The Plan Approach is incorporated within the Design and Access Statement submitted with the planning application.
QDP8 Objective 1: To assess development proposals in accordance with the Building Height and Density Guide set out in Appendix 10 of this Development Plan and associated planning guidelines. In this regard, all medium to large scale and complex planning applications (30 + residential units, commercial development over 1,00 m^2 or as otherwise required by the Planning Authority) shall be accompanied by a 'Design Statement'. The Design Statement shall include, inter alia, a detailed analysis of the proposal and statement based on the guidance, principles and performance-based design criteria set out in South Dublin County's Height and Density Guide. Any departures within the Proposed Development from the guidance set out in the Building Height and Density Guide for South Dublin County (Appendix 10) shall be clearly highlighted in the Design Statement. (See Chapter 12 (Water) Implementation and Monitoring).	As per IM mechanism 12.5.2, a Design and Access Statement has been developed to consider all the elements within QDP8, and other relevant policies form the CDP. This has been submitted with the planning application.
QDP11 Objective 3: To promote the reuse and recycling of materials to promote the circular economy and reduce construction and demolition waste.	As per IM mechanism 12.11.3, a Construction and Demolition Waste Management Plan has been developed and is included as part of the Construction Environmental Management Plan (CEMP) which accompanies this EIAR (refer to Appendix 5.1).
SM6 Objective 8: To require all major traffic generating development to submit a Mobility Management Plan / Workforce Plan and / or Traffic and Transport Assessment.	As per IM mechanism 12.7.3, a Mobility Management Plan has been developed and included in Appendix 6.1 of this EIAR.
E3 Objective 3: To require all new development to be designed to take account of the impacts of climate change, and that energy efficiency, energy provision and renewable energy measures are incorporated in accordance with national building regulations and relevant policy and guidelines.	As per IM mechanism 12.10.1, an Energy Efficiency and Climate Change Adaptation Design Statement has been developed and submitted with the planning application.

The Proposed Development is largely in compliance with, and supportive of, these and other policies of the CDP. The Proposed Development will result in an increase in employment densities at an appropriate level that reflects the location and access to public transport services. Power will be sourced from renewables, wherever possible, and designed so that it is future proofed to facilitate connection to a district heating system, if one becomes available. Although under the GSF policy requirements of the CDP, the Proposed Development largely – but not fully – complies, any degree of non-compliance is considered minor and therefore would not constitute a material contravention.

2.4.3 SDCC Climate Action Plan (SDCC, 2024)

At the County Council Meeting in February 2024, the Elected Members of SDCC, voted to approve the new Climate Action Plan 2024-2029. The Plan will be in place for a period of five years, from the date of approval. The new Climate Action Plan 2024-2029 sets out mitigation, adaptation and other climate action measures, to create a low carbon and climate resilient County.

The Plan includes a range of actions across the six theme areas of Energy and Buildings, Transport, Flood Resilience, Nature Based Solutions, Circular Economy & Resource Management and Citizen Engagement.

This is aligned to the Government's overall National Climate Objective as set out in the national Climate Action Plan, which seeks to pursue and achieve, by no later than the end of 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy.

In relation to data centre development, the plan states that "*SDCC will limit and restrict, as far as possible, large energy users such as data centres from constructing additional fossil fuel infrastructure such as natural gas powered plants. It states that significant electricity consumers, such as data centres and other large industrial sites, should maximise on-site renewable generation and ensure any remaining demand is supplied through renewable Power Purchase Agreements (preferably those which match hourly site demand), which finance renewable electricity projects within Ireland or its territorial waters.*"

GIL's current projections indicate that, once operational, this PPA will help its offices and Data Centres in Ireland to reach 60% carbon-free energy in 2025 when measured on an hourly basis. At present, GIL matches 100% of its electricity consumption of global operations with purchases of renewable energy on an annual basis. GIL will continue to apply that approach to mitigate carbon emissions generated during the Operational Phase of the development.

The Proposed Development includes measures to facilitate district heating where excess heat is produced. This system has the potential to deliver heat for both space heating and water heating needs to nearby buildings through a network of insulated underground pipelines. This system will be realised when suitable off-takers are available.

In addition, it is proposed to provide photovoltaic (PV) panels on the roof of the FSA building. This is expected to generate 20% of the energy need associated with that occupied building through the use of renewable power.

2.5 Conclusion

In conclusion, the need for the Proposed Development is firmly established throughout this Chapter in the context of its essential contribution to Ireland's ICT needs. It is apparent that data centres form part of the critical infrastructure which help process, store, and distribute huge volumes of information at a significant scale and speed.

The Government Statement on the role of Data Centres in Ireland's Enterprise, describes that *Data Centres represent a core digital infrastructure for both Ireland's and Europe's digital economies and for strengthening Ireland's position as a strategic international location for IT services. This is the infrastructure that lies behind all digital aspects of our social and work lives, including video calling, messaging and apps, retail, banking, travel, media, and public service delivery in areas such as healthcare and welfare.*

The Proposed Development will contribute to the growing and increased demand for computing power resulting from AI, and the Proposed Development can provide substantial employment and economic value for the Irish economy. Data Centre investment and the wider technology multinational company base in Ireland has had a positive and supportive influence on the development of the indigenous technology sector.

The Proposed Development strongly aligns with the principals of all relevant local, regional and national policy. Where Green Space Factor policy is not fully complied with, any degree of non-compliance is considered minor, and every attempt has been made to provide alternative site-specific GI interventions or other contributions as agreed.

2.6 References

Central Statistics Office (2019) *Information and Communications Technology: A Value Chain Analysis 2019*

Climate Neutral Data Centre Pact (2024) *Climate Neutral Data Centre Pact*

Eastern and Midlands Regional Assembly (2019) *Dublin Metropolitan Area Strategic Plan*

Eastern and Midlands Regional Assembly (2019) *Regional Spatial & Economic Strategy*

Government of Ireland (2018) *National Planning Framework*

Government of Ireland (GoI) (2022) *Government Statement on the role of Data Centres in Ireland's Enterprise Strategy*

Government of Ireland (GoI) *(2022) Ireland's National Digitalisation Strategy, Harnessing Digital - The Digital Ireland Framework*

Government of Ireland (GoI) (2024) *Climate Action Plan (CAP) 2024*

H. Thelle, M. (2024) *The economic opportunity of generative AI in Ireland*

SDCC (2022) *South Dublin County Development Plan 2022- 2028*

SDCC (2024) *South Dublin County Council Climate Action Plan*

3. Alternatives

3.1 Introduction

This Chapter provides a description of the reasonable alternatives studied by Google Ireland Ltd. (GIL) which are relevant to the Data Centre Development DC3 (referred to as the "Proposed Development") and its specific characteristics, an indication of the main reasons for selecting the current design, including a comparison of the environmental effects.

Directive 2011/92/EU, as amended (the EIA Directive) requires the Environmental Impact Assessment Report (EIAR) prepared by the developer to include a description of the "reasonable alternatives" studied by the developer.

These are reasonable alternatives which are relevant to the project and its specific characteristics and must also indicate the main reasons for the option chosen taking into account the effects of the Proposed Development on the environment and may relate to matters such as Proposed Development design, technology, location, size and scale, as set out in Article 5(1)(d) and Annex IV, clause 2 of the EIA Directive and Schedule 6, clauses 1(d) and 2(b) to the Planning and Development Regulations 2001 as amended (the 2001 Regulations).

Section 3.2 presents the legislative framework and guidance which has been considered during the preparation of this Chapter. Sections 3.3 (*Alternative Sites*) and 3.4 (*Alternative Layout Designs*) present the alternatives (and comparison of environmental effects, where relevant) that were considered by GIL.

Chapter 2 (Need for the Proposed Development) of this EIAR, should be read in conjunction with the assessment on alternatives as the analysis contained therein is relevant in the context of the reasoning applied in the assessment of alternatives carried out in this Chapter and informs the reasoning applied throughout.

Refer to Appendix 1.1 for the competency of the author of this Chapter.

3.2 Legislative Framework

3.2.1 Background

The European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (the 2018 Regulations) transposed into national law the requirements of Directive 2014/52/EU, which in turn amended the EIA Directive. The 2018 Regulations substituted a new Schedule 6 into the 2001 Regulations ("Information to be contained in EIAR") with the updated Schedule 6 requiring the EIAR to include a description of the "reasonable alternatives" studied by the developer.

Article 5(1) of the EIA Directive (as amended) provides that the EIAR shall contain:

"1d) a description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the Proposed Development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment".

Furthermore, Annex IV, clause 2 of the EIA Directive ("Information for the Environmental Impact Assessment Report") states that the EIAR shall contain:

"a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects".

Clauses 1(d) and 2(b) in the updated Schedule 6 to the 2001 Regulations transpose the above requirements into national law.

The amended EIA Directive requires that the environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the prescribed environmental factors which include:

- Population and human health;
- Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
- Land, soil, water, air and climate;
- Material assets, cultural heritage and the landscape; and
- The interaction between the factors.

These prescribed factors in relation to the Proposed Development are considered in each of the relevant chapters of this EIAR as appropriate.

With the above legislative framework in mind, this Alternatives chapter of the EIAR has been prepared in accordance with the requirements of the EIA Directive and 2001 Regulations.

3.2.2 Guidance Documents

In carrying out an assessment of reasonable alternatives relevant to the Proposed Development, a systematic approach has been adopted with a view to fulfilling the legislative obligations as described above and in order that the requirements therein are adhered to in full.

In this regard, consideration was given to a number of guidance documents in the preparation of this Chapter of the EIAR. The table below sets out the relevant key EIA Guidance which has been consulted in the preparation of this Chapter.

In this regard, consideration was given to a number of guidance documents in the preparation of this Chapter of the EIAR, as set out below.

All such guidance and documentation have informed the assessment of reasonable alternatives as carried out and detailed in this Chapter of the EIAR.

- Department of Housing, Planning and Local Government (2018) Circular PL 05/2018 -Transposition into Planning Law of Directive 2014/52/EU amending Directive 2011/92/EU on the effects of certain public and private projects on the environment (the EIA Directive) and Revised Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment;
- Environmental Protection Agency (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports;
- European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report; and
- Government of Ireland (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018).

3.2.3 Examination of Alternatives

There is limited European and national guidance on what constitutes a ‘reasonable alternative’. It is noteworthy however, that the aforementioned European Commission guidance document (2017) states the following on reasonable alternatives:

“Reasonable Alternatives must be relevant to the proposed Project and its specific characteristics, and resources should only be spent assessing these Alternatives. In addition, the selection of Alternatives is limited in terms of feasibility. On the one hand, an Alternative should not be ruled out simply because it would cause inconvenience or cost to the Developer.

At the same time, if an Alternative is very expensive or technically or legally difficult, it would be unreasonable to consider it to be a feasible Alternative…

Ultimately, Alternatives have to be able to accomplish the objectives of the Project in a satisfactory manner, and should also be feasible in terms of technical, economic, political and other relevant criteria".

The European Commission guidance also states that:

"The feasibility of the Alternatives proposed can be determined on a case-by-case basis. The final set of reasonable Alternatives identified will then undergo a detailed description and assessment in the EIA Report…. It should be noted that each Project and each EIA is different, and there can be no definitive list prescribing how Alternatives are to be identified and assessed….

In some cases, Alternatives will have been developed at the plan stage (e.g. a plan for the transport sector, a regional development plan, or a spatial plan) or by the Developer during the Project's initial design. In such cases, some Alternatives may have already been excluded, in which case, it would likely be unnecessary to consider them again".

Pursuant to EPA guidance, the consideration of alternatives also needs to be cognisant of the fact that:

"in some instances some of the alternatives described below will not be applicable – e.g. there may be no relevant 'alternative location'…"

Taking the foregoing guidance and legislative framework into account, the alternatives in relation to this Proposed Development are considered in terms of alternative site locations (Section 3.3) and alternative layout designs (Section 3.4) at the preferred site.

The nature of the building and the technical requirements do not allow for alternative technologies or alternative building layouts to be investigated as part of this development. Any small change in the building characteristics and the way the parts interact with each other would void the building function, due to the complexity of the operations being carried out and the complexity of the interaction between the parts composing the DC3 development.

In accordance with EPA guidance, the range of alternatives can include a 'do-nothing'. The 'do-nothing' scenario has been assessed under all relevant environmental disciplines. In general, in the absence of the Proposed Development, the direct and indirect employment opportunities will not arise. In addition, the do-nothing scenario would limit the data centre capacity required to power the cloud and the digital revolution that is transforming all sectors of the economy.

3.3 Alternative Sites

In accordance with EPA guidance, the consideration of alternatives also needs to be cognisant of the fact that:

"in some instances some of the alternatives described below will not be applicable – e.g. there may be no relevant 'alternative location'…"

No alternative sites were considered for the Proposed Development for the following reasons:

- The site is owned by GIL (apart for the section being developed for the purposes of the pedestrian / cycle access to the north). GIL chose not to consider alternative sites which are the property of a third-party so that the development could make use of provisions, services and equipment already available onsite, with a sustainable approach in mind;
- The site is adjacent to the DC1 and DC2 GIL permitted development site which is under GIL's ownership and provides an opportunity for an extended and co-ordinated data centre campus optimising connections to services and reducing travelling for employees already present on site that may work across the three DC buildings;
- The site is located within an area identified in SDCC's CDP 2022-2028 as an area for enterprise and employment uses;
- The site sits within a wider area which has other data centres and has good network provision and fibre suppliers, that suit the needs of the site and is thus considered an ideal location for the Proposed Development to be situated; and

- Adequate power provision is provided to the site by Eirgrid.

3.4 Design Evolution

The design of the Proposed Development evolved over a period of time in the context of the surrounding area. The majority of the buildings surrounding the site of the Proposed Development are industrial in nature with some sparse residential and private buildings mainly located to the south and the east of the site, refer to Figure 3.1.

Figure 3.1: Site context.

There is a clear transition line between the eminently industrial function to the north of Baldonnel Road and the green spaces to the south refer to Figure 3.2.

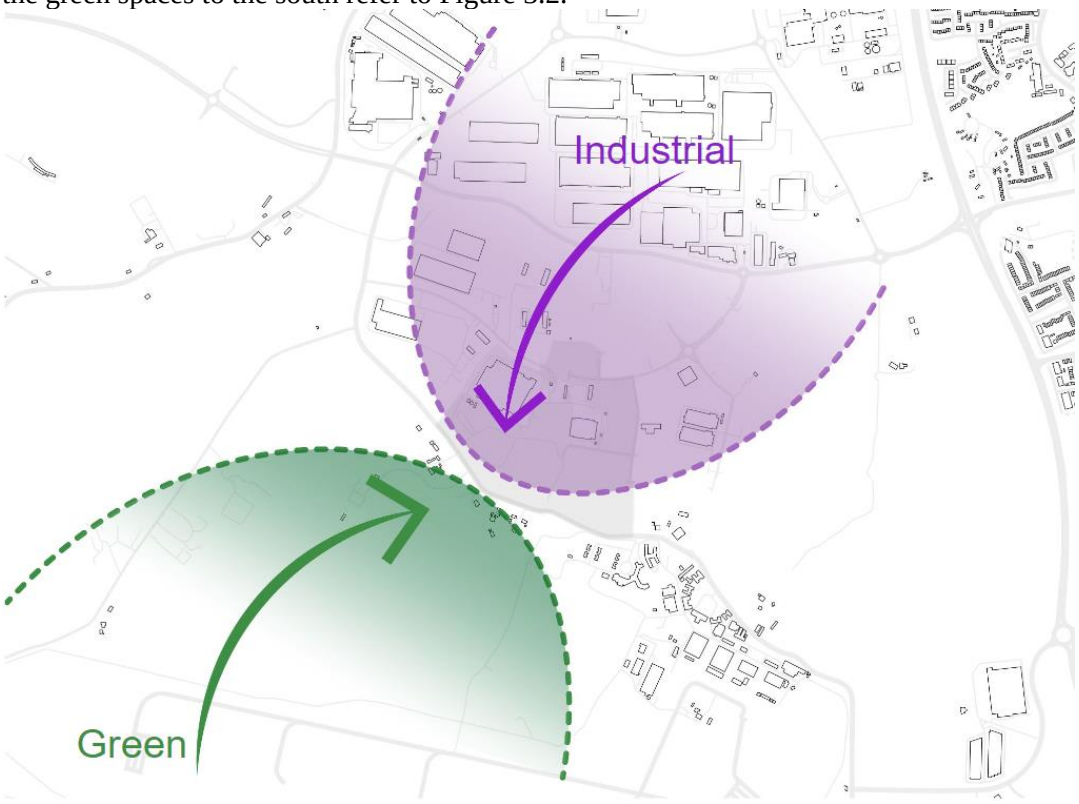

Figure 3.2: Industrial/green.

This transition is softened and integrated within a green buffer strip running all along Baldonnel Road to the south of the GIL site, which provides a natural visual screen to the industrial facility to the North, refer to Figure 3.3.

Figure 3.3: Green buffer.

With these principles in mind, the northern part of the development has been designed to maintain the existing industrial fabric of the surrounding area, while creating a strong linear front and a green buffer to the south side, north of Baldonnel Road. Further details on how the layout of the Proposed Development was formed, is provided in the following sections.

3.5 Alternative Layout Designs

3.5.1 Introduction

The evolution of the Proposed Development has undergone a number of phases, including:

- Technical and environmental due diligence;
- Campus masterplanning; and
- Preliminary design.

During each of these phases, environmental and technical aspects were considered so that the optimum design could be arrived upon.

3.5.2 Design Development

The main parameters considered in assessing the various options were the following:

- Maintenance of the correct relationship between the Data Centre building and the supporting equipment (Mechanical Yard (MYD) and Electrical Yard (EYD));
- Office spaces orientation towards the green zoning area to the southeast;
- Optimized roads layout, including optimized vehicle access to loading dock and optimized pedestrian access to the Office part of the Data Centre building;
- Optimized trestles and pipe conveyors connections between MYD and the Data Centre building;
- Avoid pinch points around loading dock;
- Minimise pinch points towards Baldonnel Road;

- Avoid clashes with overhead electrical line;
- Minimise cut and fill required on site required to set a finish floor level for the Data Centre building and the EYD and MYD; and
- Avoid construction of DC3 affecting operativity on DC1 and DC2 sites.

During the technical due diligence phase of DC3 a multitude of conceptual masterplans were developed to achieve the objectives of the Proposed Development while taking into consideration environmental and social factors. Data centre buildings are highly process driven and meticulous in their operation. To facilitate this, these building typologies typically have predetermined layouts nonetheless a number of options were considered through the evolution of the design. Technical alternatives included the consideration of both air and water cooling. Air cooling was selected due to lack of available technical/industrial water to the site.

The following elements were considered fundamental to the design and were fixed for all options considered:

- Maintenance of the Zoned Rural Area in the southeast corner of the site as required by the SDCC zoning plan;
- Retention and enhancement of 5m landscape buffer along Baldonnel Road, to the south of the site to provide suitable visuals screening from Baldonnel Road and the sensitive residential receptors on Baldonnel Road; and
- Provision of a SuDS network with associated swales and attenuation ponds as required.

The following environmental assessments were undertaken, of various design options, so that the preferred option could be developed further:

- Air quality – iterations of options including a variation of stack heights and operational hours;
- Noise – iteration of various abatement measures and low noise mechanical plant, where required;
- Water / ecology – variation of the proposed stream diversion and culverting/daylighting;
- Landscape and visual – consideration of space for landscaping provision;
- Climate – provision of photovoltaic (PV) solar panels, limited to the Data Hall 1 roof, to minimise the fire risk. Further extensive PV provision could potentially introduce unacceptable fire risks; and
- Water – provision of green roofs, not feasible due to major water leak risks, fire risks and excessive loads on the main structure. In particular, any risk of water ingress within a space hosting complex electrical equipment such as a Data Centre needs to be avoided.

Characteristics of options that were considered are discussed in the following sections including an indication of the main reasons for the option chosen, taking into account the effects of the Proposed Development on the environment.

The nature of the building, its function and the complexity of interoperations between different components dictate the relation between parts with a fixed position for the connection of the MYD, connecting into the left side of the building and the EYD connecting into the right side of the building. For the Data Centre to operate successfully, the supporting technical equipment yards need to be connected following firm technical rules.

Following these technical drivers, the options under consideration have kept a consistent approach for the location of the Facility Support Area (FSA), the EYD and the MYD relative to the data centre building. Any variation in the relationship between the parts would interfere with the data centre functioning.

From an environmental perspective, the following overarching considerations were applied to the design development:

- Maintenance of existing biodiversity, landscape; and
- Potential effects on sensitive receptors.

3.5.3 Alternative Options

3.5.3.1 Option 1

In Option 1, the DC3 building is oriented on the east-west axis with the FSA to the east. The EYD is located to the south of the DC3 building. The MYD is split in two areas, one to the north-east of the Data Centre building and one to the southwest of the building, refer to Figure 3.4 The HV Compound is located in the centre of the site.

This Option was deemed to be not suitable due to the position of the MYD block to the southwest which has the potential to result in non-compliance with noise limits at the nearest sensitive receptors to the south. On the basis of this issue, this Option was not developed further.

All Options from Option 1 to Option 10A, B, C show an additional enlarged entrance block to the north of the site. This has subsequently been discarded since in depth traffic and access studies have confirmed that the existing access, as provided for DC1 and DC2 can provide access to the DC3 development.

The space initially allocated for the enlarged entrance has therefore been used to accommodate additional landscaping.

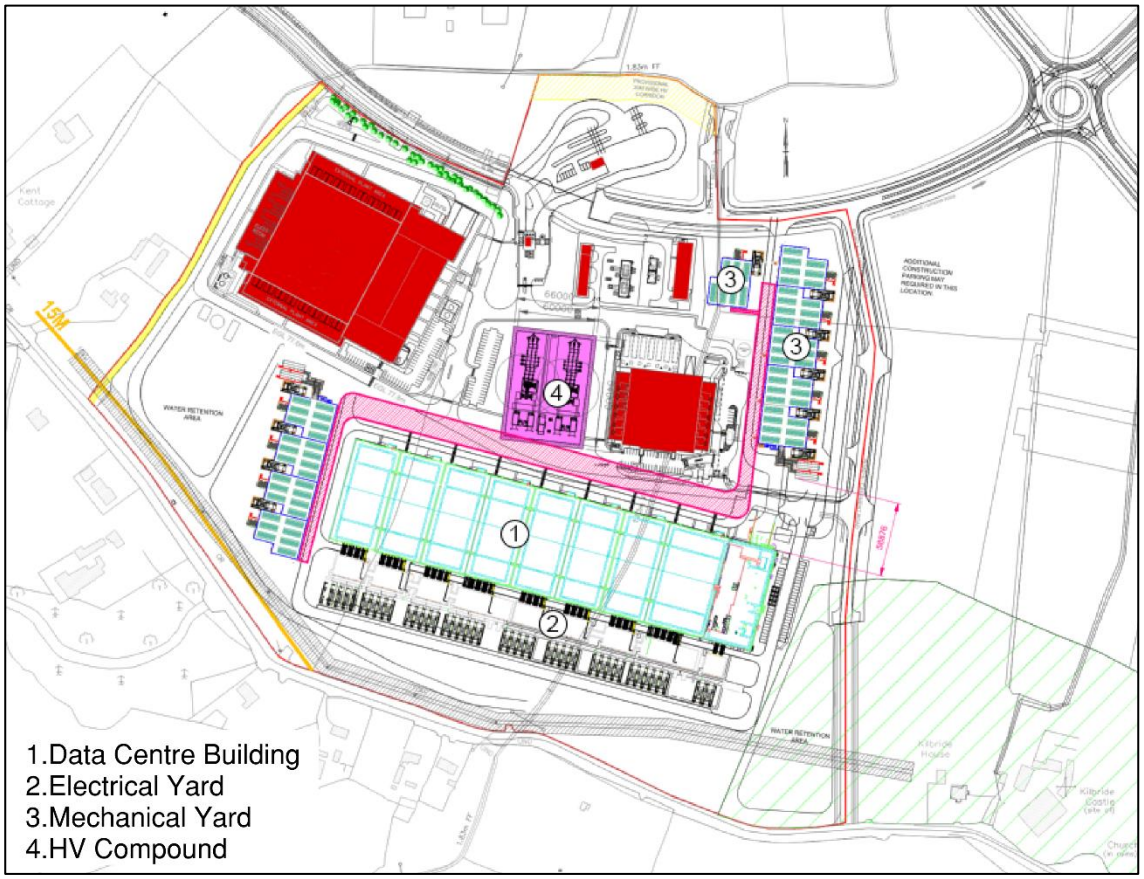

Figure 3.4: Option 1.

3.5.3.2 Option 2

In Option 2, the DC3 building is oriented on the east-west axis with the FSA to the east. The MYD is split in two areas, one to the north-east of the Data Centre building and one to the southwest of the building. The EYD is located to the north of the Data Centre building. The HV Compound is located at the centre of the site, refer to Figure 3.5.

This Option was deemed not suitable due to the position of the second MYD to the south-east which has the potential to result in non-compliance with IE licence noise limits at the nearest sensitive receptors.

The position of the EYD on the west side of the Data Centre building is not compatible with the data centre design which allows connection of the data hall to the EYD only to the right side of the building (to the south in this configuration). On the basis of these issues, this Option was not developed further.

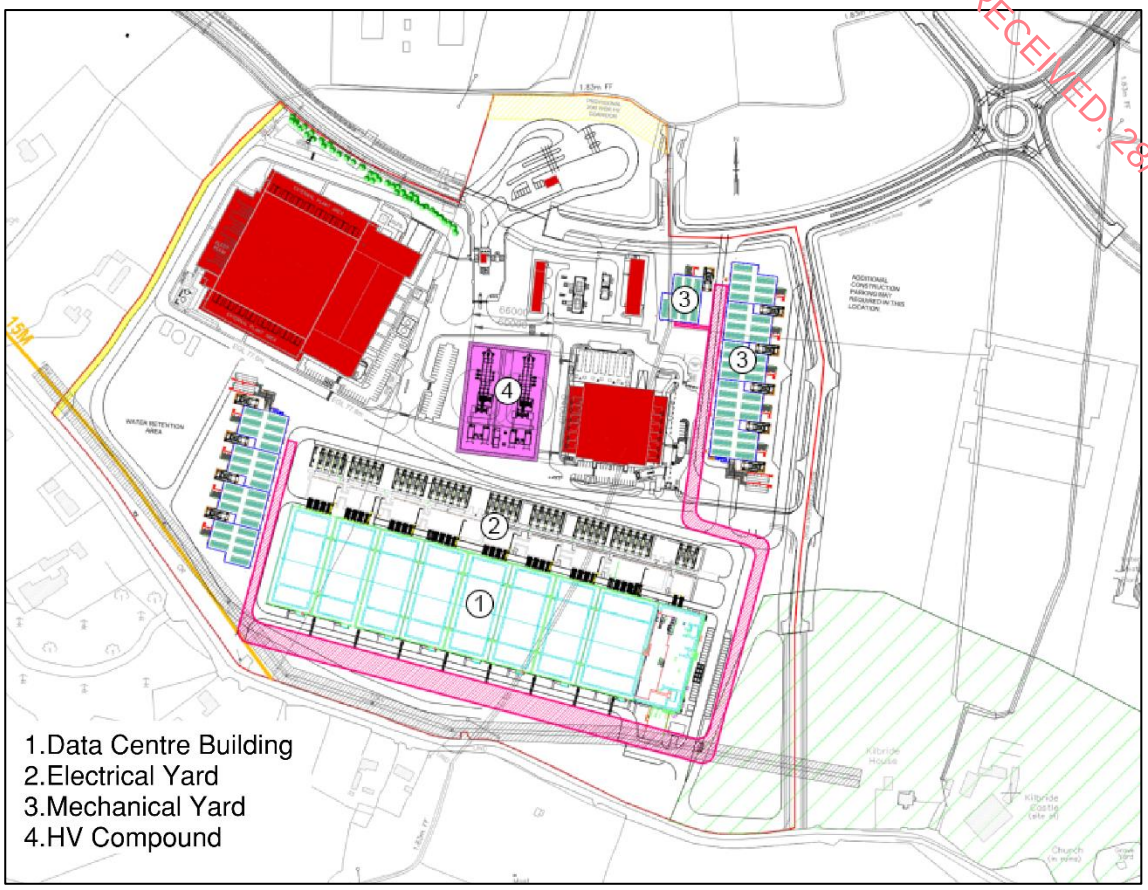

Figure 3.5: Option 2.

3.5.3.3 Option 3

In Option 3, the DC3 building is oriented on the east-west axis with the FSA to the east. The MYD is split in two areas, one to the north-east of the Data Centre building and one to the south-east of the Data Centre building. The connection of the MYD to the Data Centre building is positioned on the northern side of the Data Centre building occupying the central part of the site. The EYD is located to the south of the Data Centre building. The HV Compound is located at the centre of the site, refer to Figure 3.6.

This Option was deemed not suitable due to the position of the second MYD to the south-east which has the potential to result in non-compliance with IE licence noise limits at the nearest sensitive receptors. There is also a difference in level between the two MYD blocks, adding complexity to the constructability. In addition, the east site elevation is occupied by the MYD blocks creating a very long industrial elevation, resulting in potential visual effects. On the basis of these issues, this Option was not developed further.

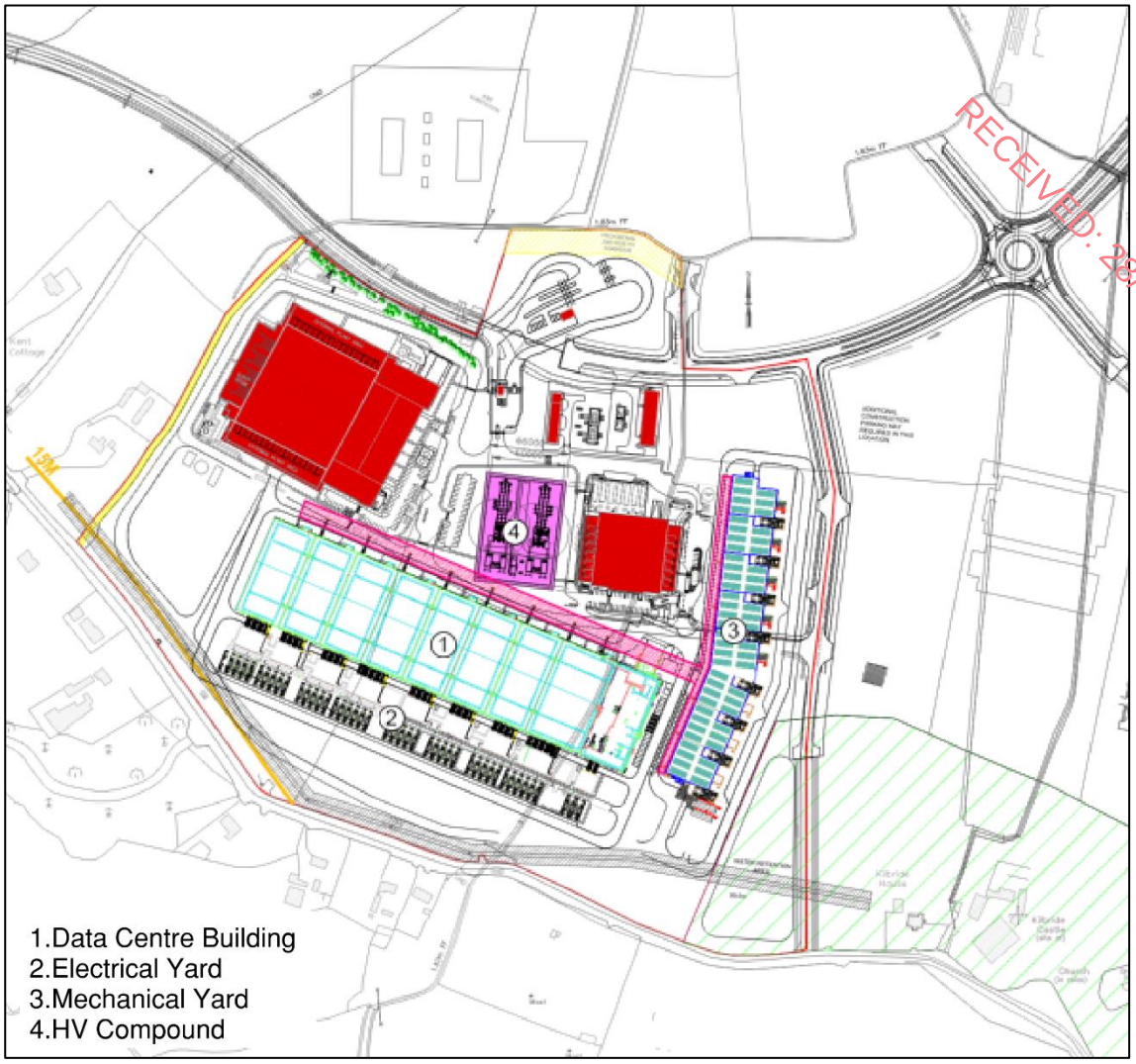

Figure 3.6: Option 3.

3.5.3.4 Option 4

In Option 4, the Data Centre building is oriented on the east-west axis with the FSA to the east. The MYD is split in two areas, one to the north-east of the Data Centre building and one to the south-east of the DC3 building. The EYD is located to the north of the Data Centre building. The HV Compound is located at the centre of the site, refer to Figure 3.7.

The position of the second MYD block to the southeast has the potential to result in non-compliance with IE licence noise limits at the nearest sensitive receptors. There is a difference in level between the two MYD blocks, adding complexity to constructability. In addition, the whole east site elevation is occupied by MYD blocks creating a very long industrial elevation, resulting in potential visual effects offsite. The MYD connects to the Data Centre building to the south side, which is not compatible with the data halls arrangement thus rendering this Option not functional. On the basis of these issues, this Option was not developed further.

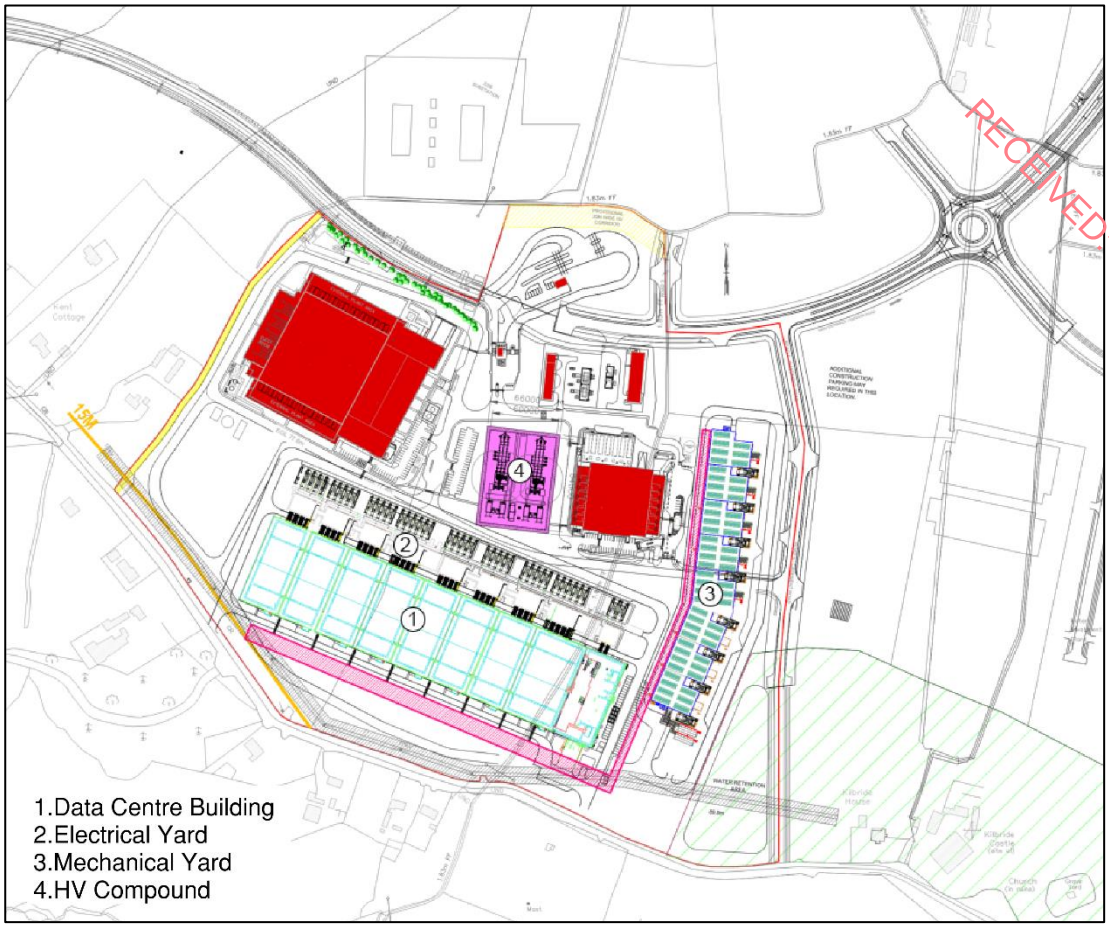

Figure 3.7: Option 4.

3.5.3.5 Option 5

In Option 5, the Data Centre building is oriented on the east-west axis with the FSA to the west. The MYD is split in two areas, one to the northeast of the Data Centre building and one to the south-west of the site. The EYD is located to the north of the Data Centre building. The HV Compound is smaller for this Option and located to the north of the site, refer to Figure 3.8.

The connection of the MYD to the Data Centre building is complex and runs from the north-east side around the Data Centre building to the east and down to the south side. The connection to the second Mechanical block starts from the south-west and runs south, over the Loading Dock (LD). The position of the LD and its ramp on the south-west, creates a pinch point which is not functional, especially around the existing overhead electric line. The second block of the MYD is located to the south-west corner, which has the potential to result in non-compliance with noise limits at the nearest sensitive receptors. On the basis of these issues, this Option was not developed further.

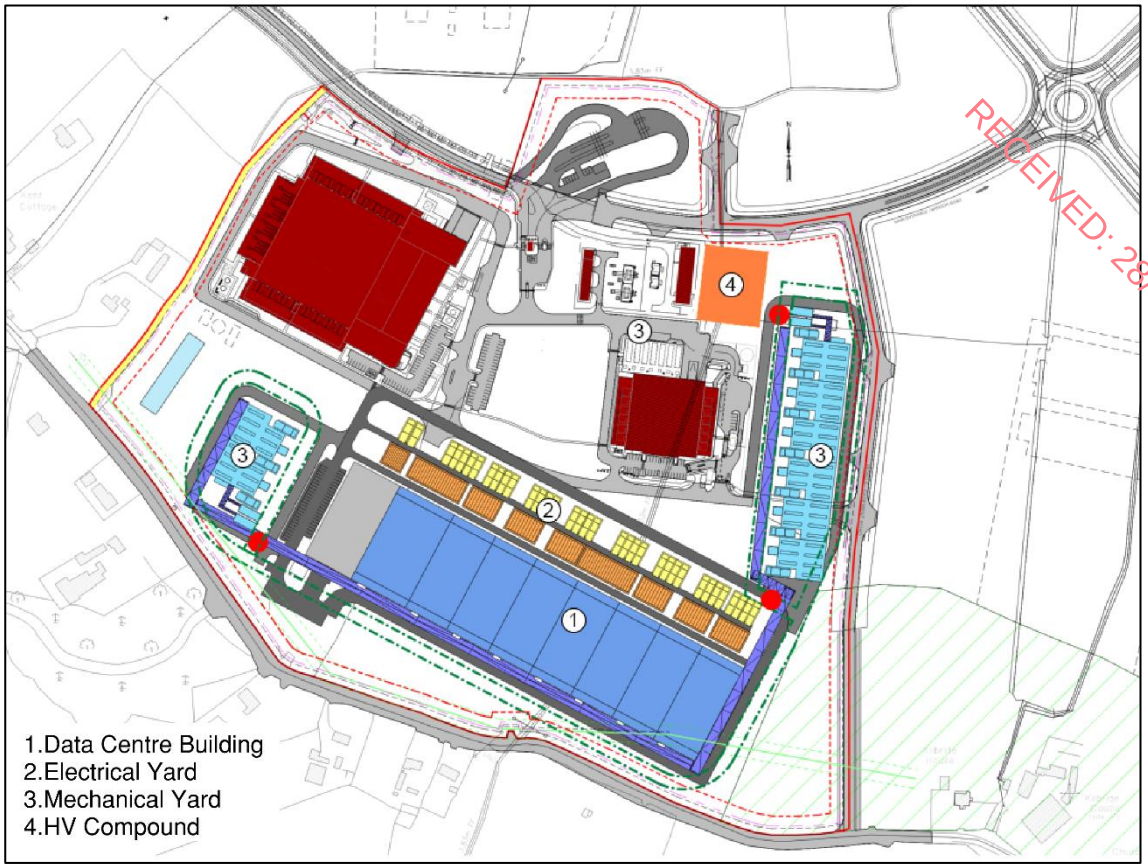

Figure 3.8: Option 5

3.5.3.6 Option 6

In Option 6, the Data Centre building is oriented on the east-west axis with the FSA to the west. The MYD is split in two areas, one to the north-east of the Data Centre building and one to the centre of the site. The EYD is located to the north of the DC3 building. The HV Compound is smaller and located to the north of the site, refer to Figure 3.9.

The connection of the MYD to the Data Centre building is complex and runs from the north side around the Data Centre building to the east and down to the south side, creating extremely long, hard to maintain and inefficient pipe runs. The position of the LD and its ramp, now on the south-west, creates a pinch point which is not functional, especially around the existing overhead electric line. On the basis of these issues, this Option was not developed further.

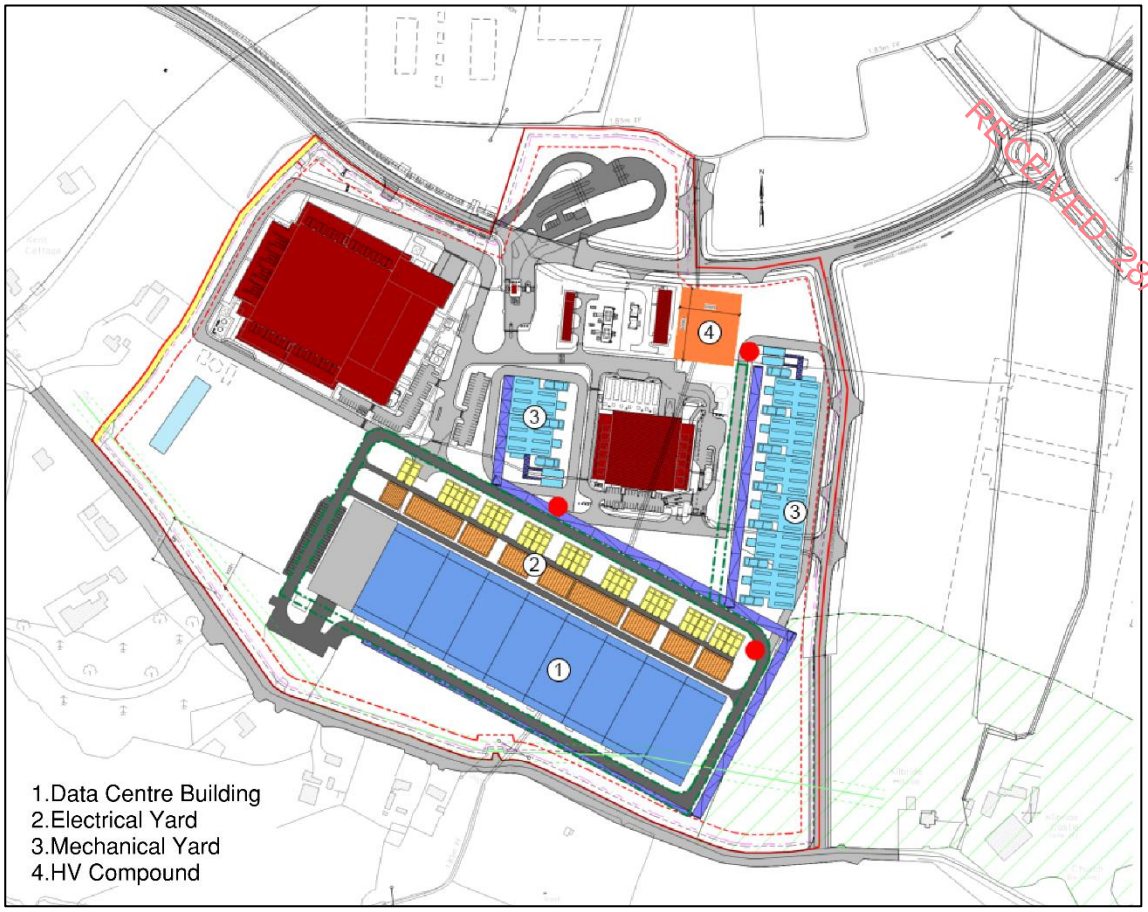

Figure 3.9: Option 6.

3.5.3.7 Option 7

In Option 7, the Data Centre building is oriented on the east-west axis with the FSA to the west. The MYD is split in three areas, one to the north-east of the DC3 building, one to the south-east of the Data Centre building and one to the centre of the site. The EYD is located to the south of the Data Centre building and the HV Compound is smaller and located to the north of the site, refer to Figure 3.10.

One of the MYD blocks is located to the south-east of the site which has the potential to result in non-compliance with IE licence noise limits at the nearest sensitive receptors. There is a long elevation of industrial buildings located to the east of the site potentially resulting in additional visual effects. On the basis of these issues, this Option was not developed further.

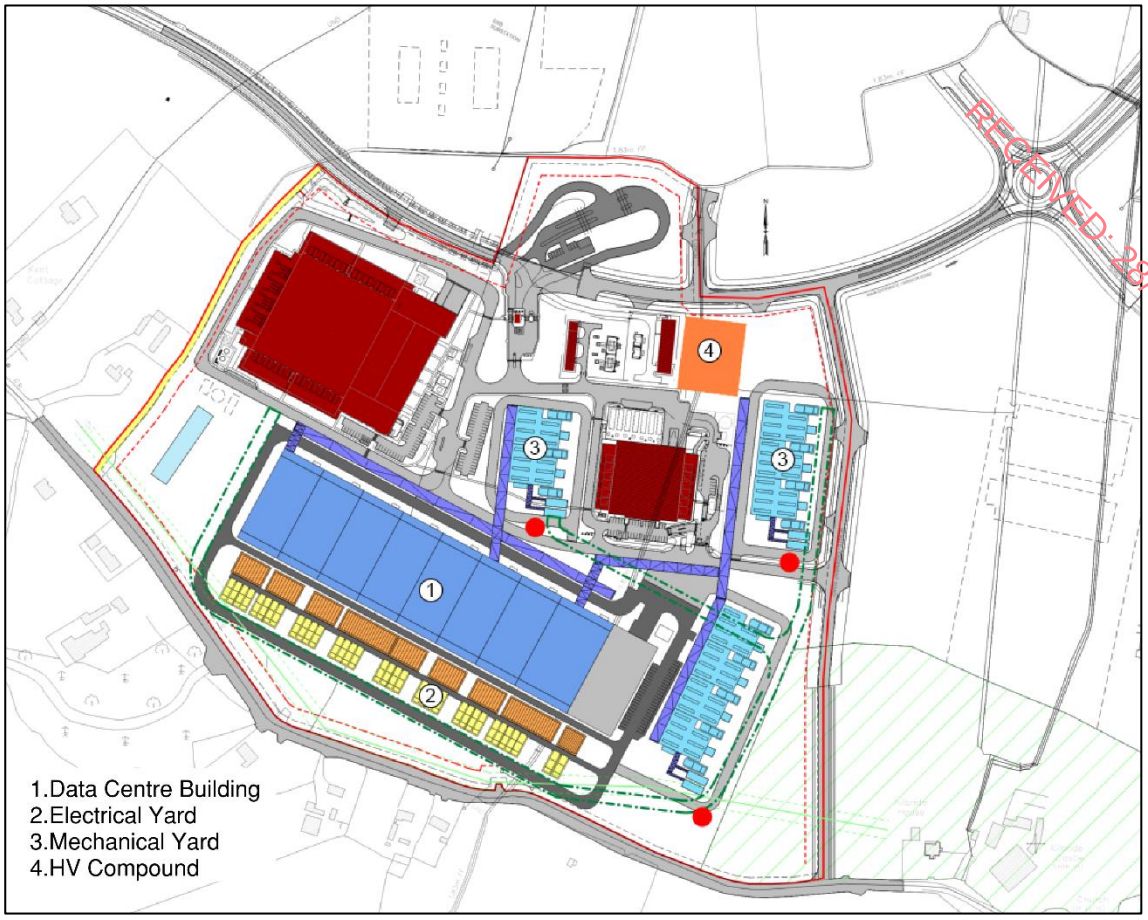

Figure 3.10: Option 7.

3.5.3.8 Option 8

In Option 8, the Data Centre building is oriented on the east-west axis with the FSA to the west. The MYD is split in two areas, one to the north-east of the Data Centre building and one to the centre of the site. This solution is similar to Option 6 (refer to Section 3.5.3.6), the only difference is that the components of the MYD to the north-east are rotated by 180 degrees. The EYD is located to the north of the Data Centre building and the HV Compound is now smaller and located to the north of the site, refer to Figure 3.11.

The MYD connection to the Data Centre building is complex and runs from the north side around the DC building to the east and down to the south side creating extremely long, hard to maintain and inefficient pipe runs. The position of the LD and its ramp, now on the south-west, creates a pinch point which is not considered functional, especially around the existing overhead electric line. On the basis of these issues, this Option was not developed further.

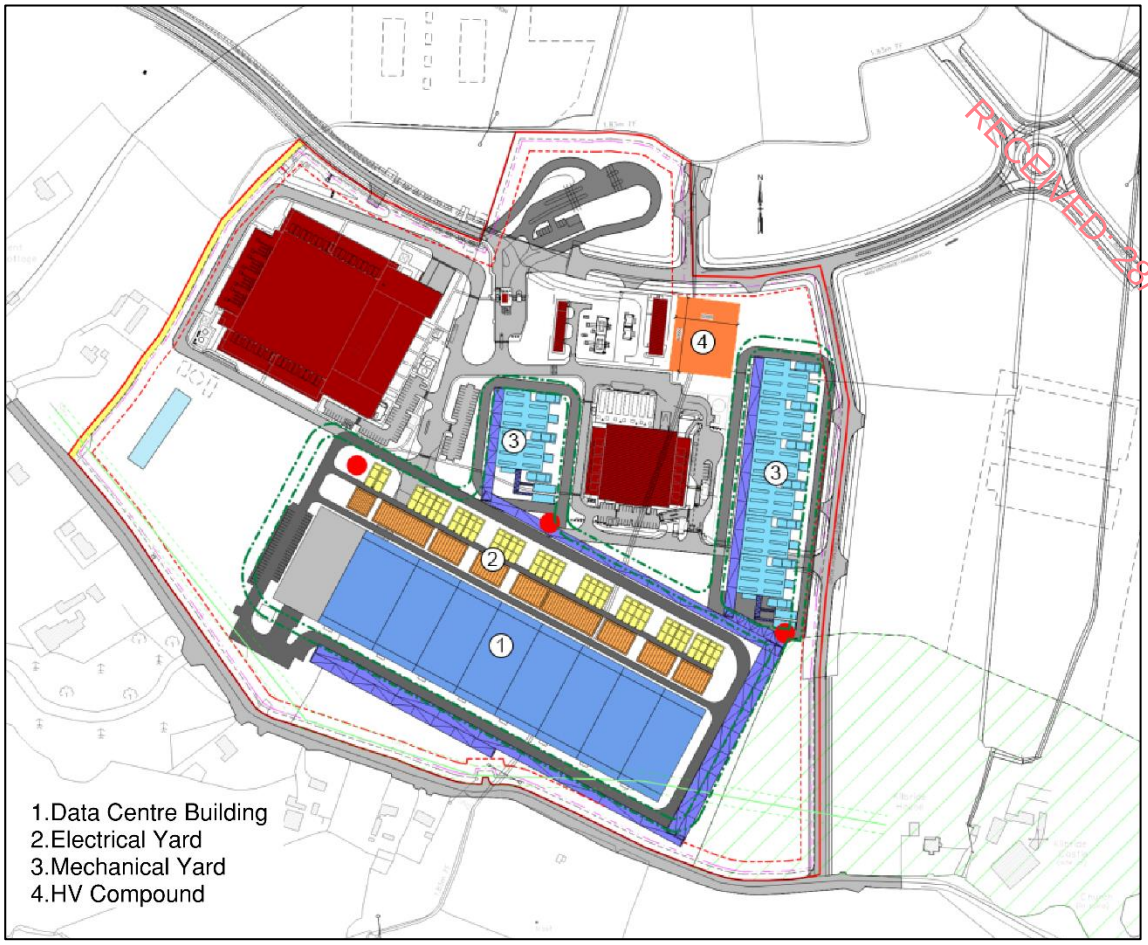

Figure 3.11: Option 8.

3.5.3.9 Option 9

In Option 9, the Data Centre building is oriented on the east-west axis with the FSA located to the west. The MYD is split in two areas, one to the north-east of the Data Centre building and one to the south-west of the site. The EYD is located to the north of the Data Centre building and the HV Compound is smaller and located to the north of the site. In comparison to Option 5 (refer 3.5.3.5) the components of the MYD to the east side are now rotated by 180 degrees, refer to Figure 3.12.

The MYD connection to the Data Centre building is complex and runs from the north-east side around the building to the east and down to the south side. The connection to the second Mechanical block comes from the south-west and runs south, over the LD, creating extremely long, hard to maintain and inefficient pipe runs. The position of the LD and its ramp, on the south-west, creates a pinch point which is not considered functional, especially around the existing overhead electric line. The second block of the MYD is located in the south-west corner which has the potential to result in non-compliance with IE licence noise limits at the nearest sensitive receptors. On the basis of these issues, this Option was not developed further.

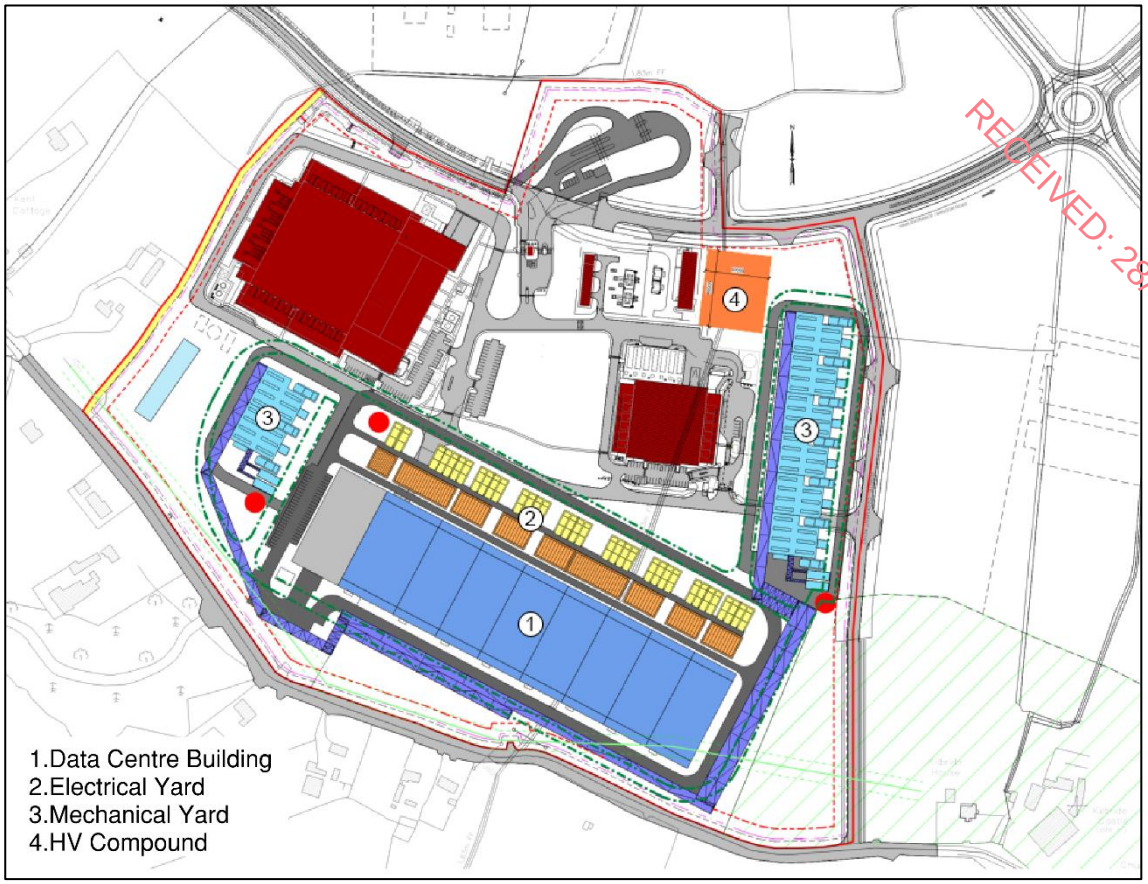

Figure 3.12: Option 9

3.5.3.10 Options 10A, 10B and 10C

In Options 10A, 10B and 10C, the Data Centre building is oriented on the east-west axis with the FSA located to the east. The MYD is split in two areas, one to the north-east of the Data Centre building and one to the centre of the site. The EYD is located to the south of the Data Centre building and the HV Compound is now smaller and located to the north of the site. These three options are a variation of the same layout, refer to Figure 3.13, Figure 3.14 and Figure 3.15. All three options have a different layout of the pipe conveyors (trestles) north of the Data Centre building.

The MYD is located to the north-east and to the centre of the site minimising noise effects off-site and ensuring compliance with IE licence noise limits at sensitive receptors in proximity to the Proposed Development. The connections of the MYD blocks are the shortest possible for this Option and the visual impact of the MYD to the east side is limited in comparison the majority of other options. On this basis, these options were developed further into Option 13.

Option 10A has the Data Centre building moved to the South East corner but the MYD overlaps with the Data Centre LD, rendering this option not suitable; Option 10B has the Data Centre building shifting to the southwest, creating two pinch points, one to the South East and the other to the South West, which is adding too much complexity; Option 10C has the Data Centre building moved to the South East, with an improved trestles layout compared to 10A, but with clashes between the East MYD and the LD. Further optimisation of the MYD design will subsequently help evolving this option in Option 13.

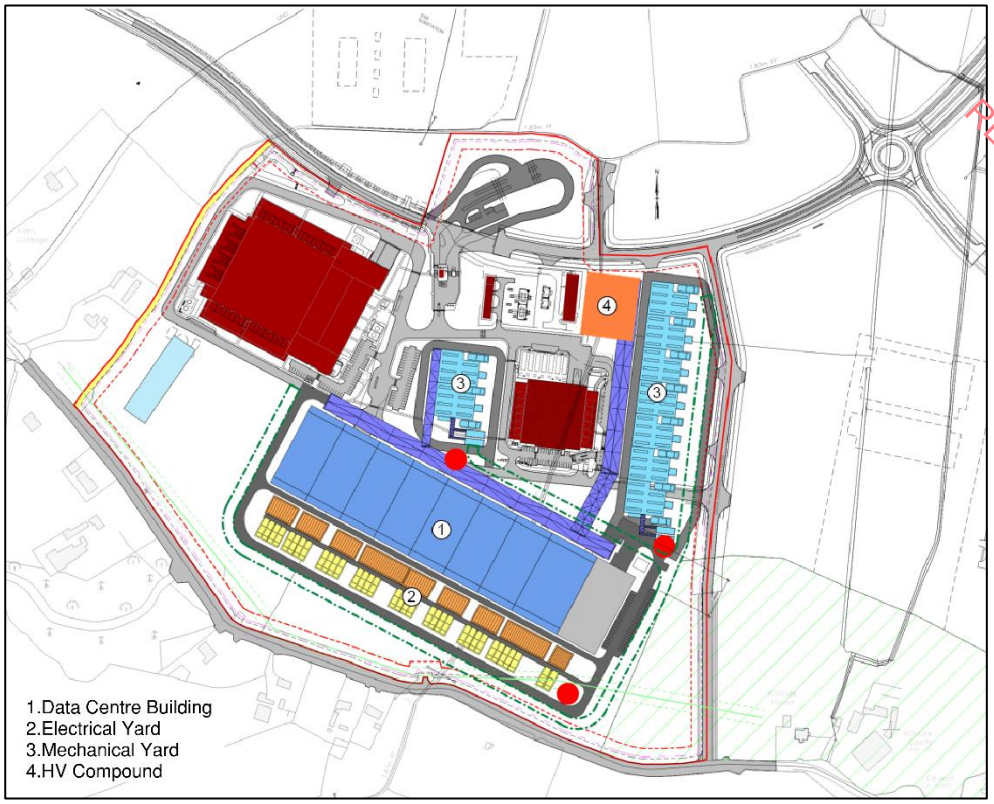

Figure 3.13: Option 10A.

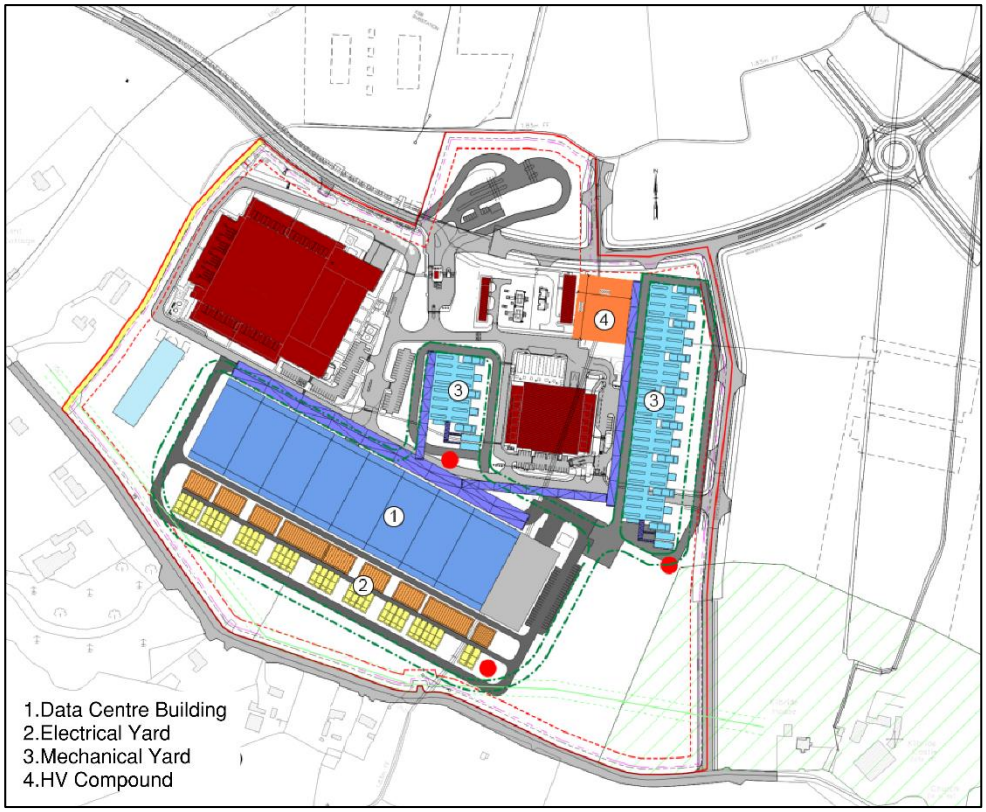

Figure 3.14: Option 10B.

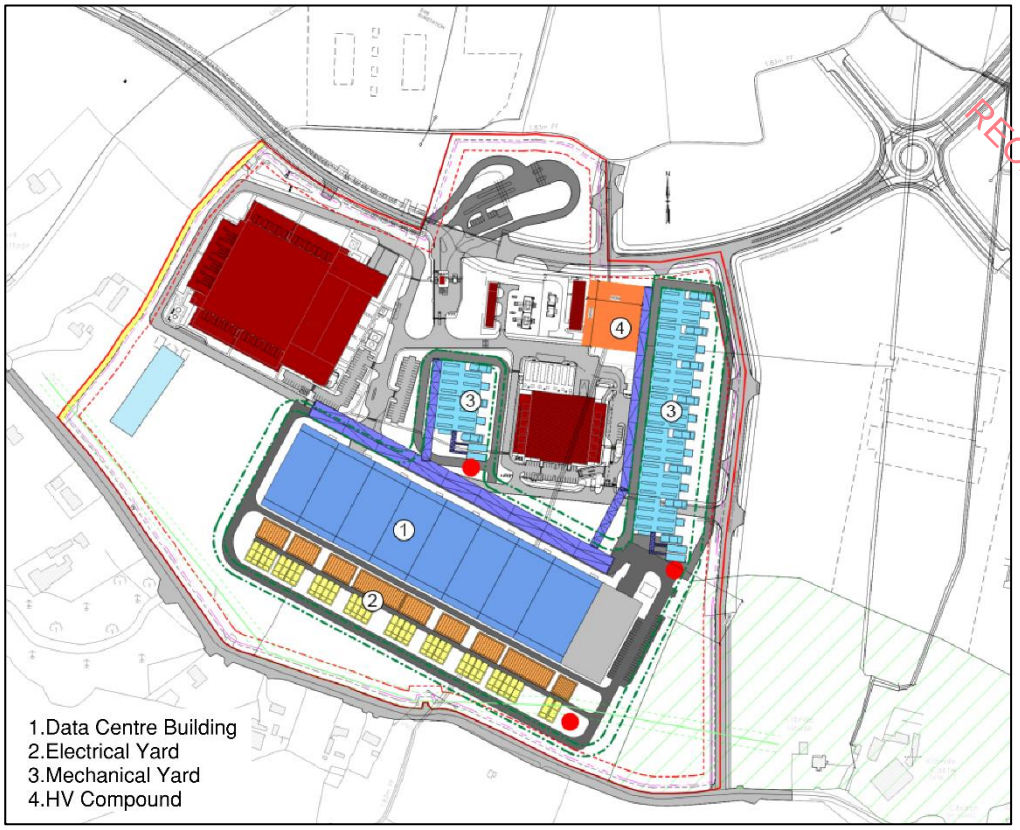

Figure 3.15: Option 10C.

3.5.3.11 Option 11

In Option 11, the Data Centre building is oriented on the east-west axis with the FSA located to the east.

The MYD is split in three areas, one to the north-east of the Data Centre building, one to the south-east and one to the centre of the site. The EYD is located to the south of the Data Centre building and the HV Compound is located to the north of the site, refer to Figure 3.16.

The MYD is located to the north-east and to the centre of the site to ensure compliance with IE licence noise limits. The connections to the MYD are split in three parts and are considered to be complex. The Data Centre building creates a pinch point to the south-west of the site in the vicinity of the overhead electric line. The road layout is also complex at the front of the FSA to the south-east corner of the site with too many link connections. On the basis of these issues, this Option was not developed further.

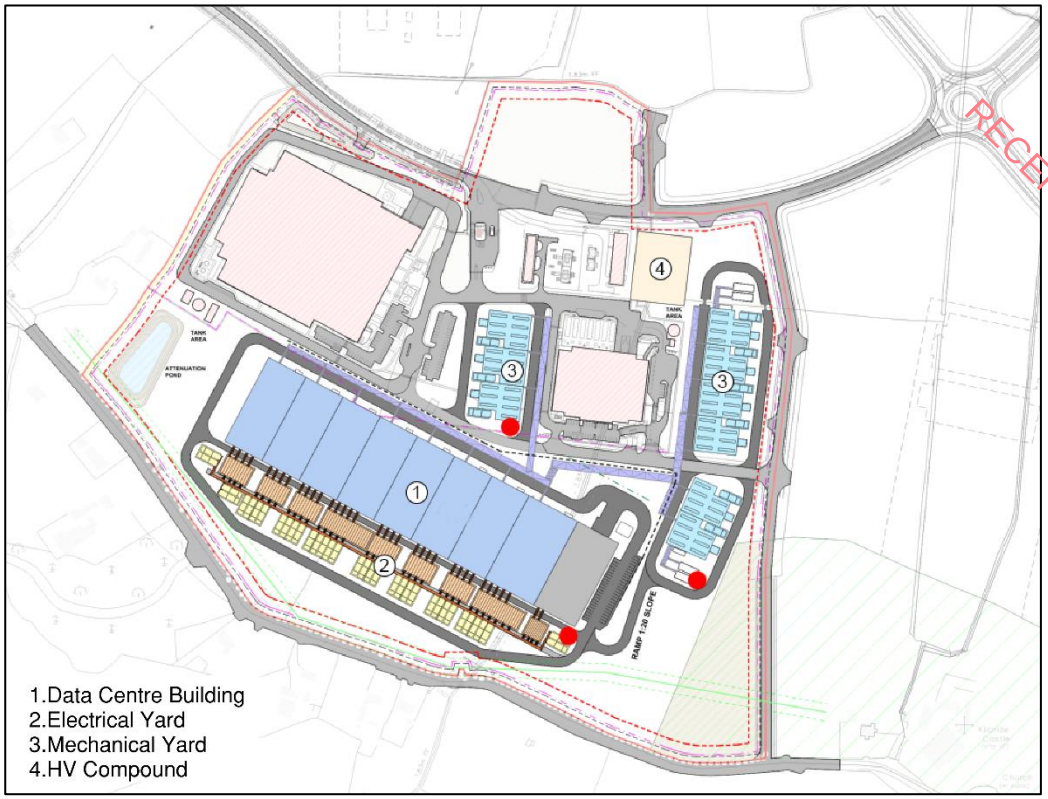

Figure 3.16: Option 11.

3.5.3.12 Option 12

In Option 12, the Data Centre building is oriented on the east-west axis with the FSA to the east. The MYD is split in two areas, one to the north-east of the Data Centre building and one to the south-east of the site. The EYD is located to the south of the Data Centre building and the HV compound is located to the north of the site, refer to Figure 3.17.

The MYD is located to the south-east of the site which has the potential to result in non-compliance with IE licence noise limits at the nearest sensitive receptors. The Data Centre building creates a pinch point to the south-west of the site in the vicinity of the overhead electric line. On the basis of these issues, this Option was not developed further.

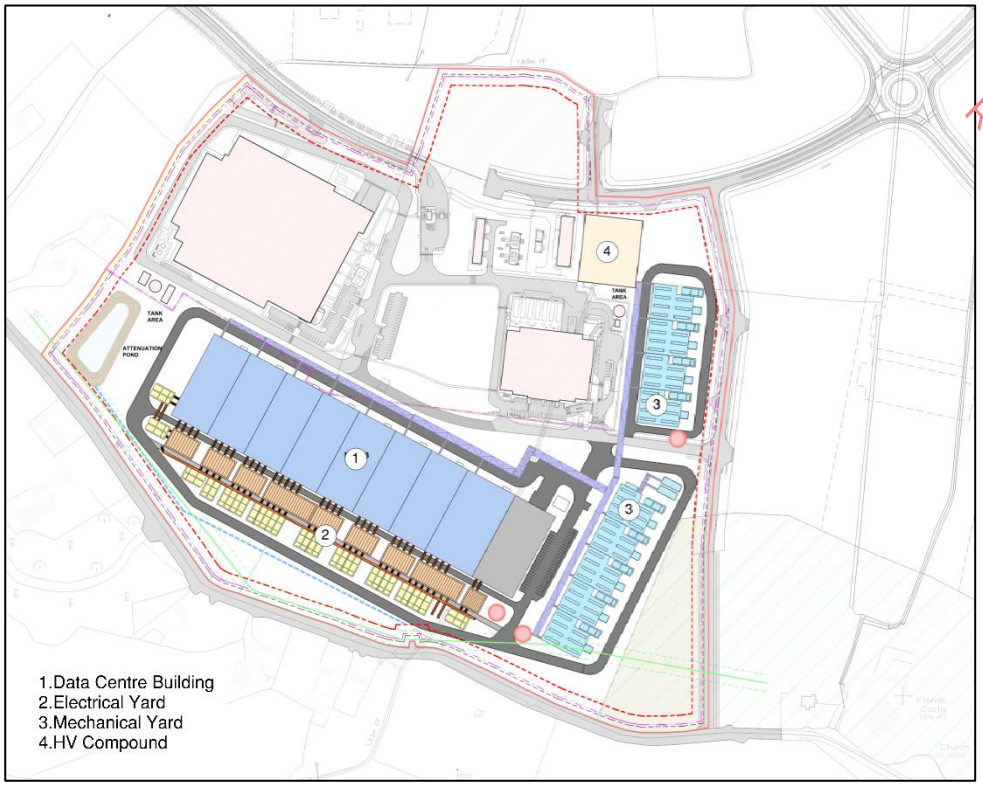

Figure 3.17: Option 12.

3.5.3.13 Option 13

Option 10a, 10b and 10c (refer to 3.5.3.10) were deemed the most suitable options. Option 13 is an improved version of these options, refer to Figure 3.18, having a more developed MYD design that allows avoiding clashes with the LD.

This solution has proved to be the most suitable option as a result of the following factors:

- This solution will ensure compliance with IE licence noise limits for sensitive receptors, as it ensures there are no significant noise sources near the sensitive receptors located to the south;
- The connection of the MYD components to the Data Centre building are shortened to the minimum possible distance;
- There are no pinch points at the back of the Data Centre building to the south-west side, which allows for the recovery of space for landscaping and maintenance of the existing overhead electrical line;
- The MYD to the east of the site is optimised in order to avoid extending to the south-east of the site; and
- The road layout is simplified and optimised in this option.

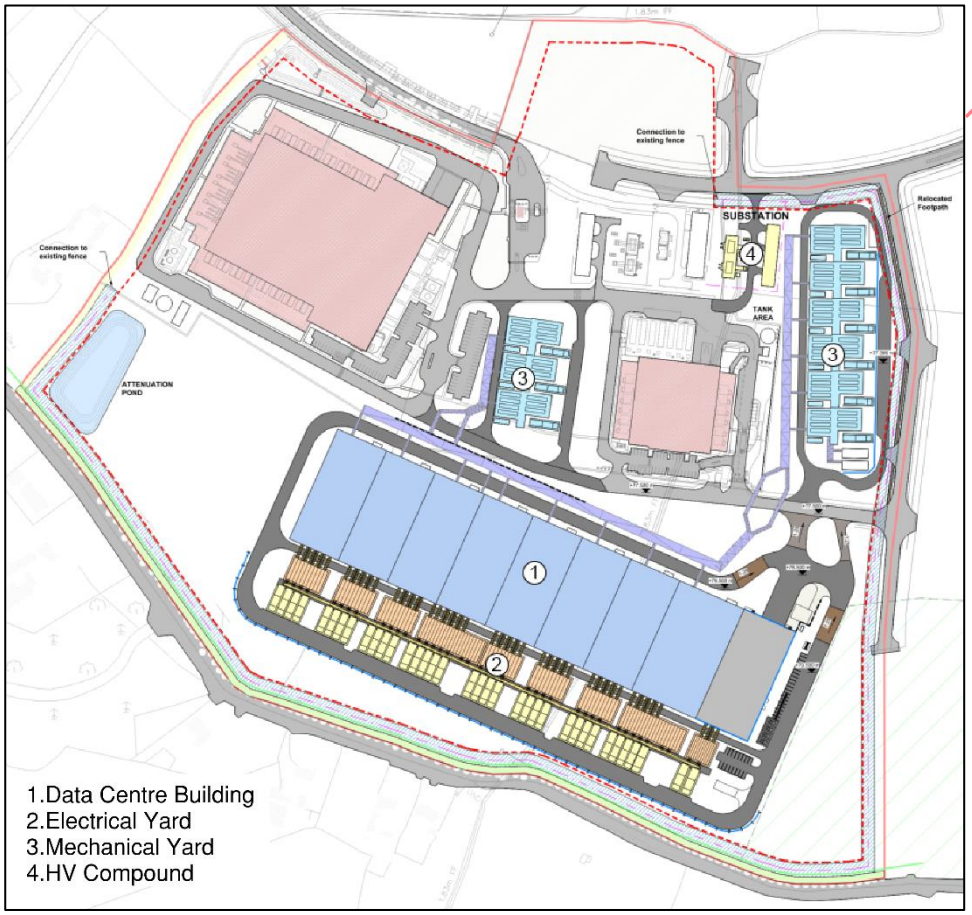

Figure 3.18: Option 13.

3.6 Conclusion

In accordance with the requirements of the EIA Directive, as amended, a description of the reasonable alternatives and an indication of the main reasons for the option chosen, taking into account the effects of the Proposed Development on the environment has been provided.

Ultimately, Option 13 is considered to be the preferred option in terms of environmental effects, functionality and constructability. It minimises the potential visual and noise effects at off-site receptors. It also accomplishes the objectives of the Proposed Development in a satisfactory manner.

3.7 References

Department of Housing, Planning and Local Government (2018) *Circular PL 05/2018*

Environmental Protection Agency (EPA) (2022) *Guidelines on the Information to be contained in Environmental Impact Assessment Reports*

European Commission (EC) (2017) *Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report*

European Union (EU) (1992) *Directive 2009/147/E Birds Directive*

European Union (EU) (1992) *Directive 92/43/EEC Habitats Directive*

European Union (EU) (2001) *Planning and Development Regulations 2001 as amended Schedule 6 Article 5(1)(d) and Annex IV*

European Union (EU) (2011) *Environmental Impact Assessment (EIA) Directive 2011/92/EU as amended.*

European Union (EU) (2011) *Environmental Impact Assessment (EIA) Directive (as amended) Article 5(1)*

European Union (EU) (2014) *Directive 2014/52/EU*

Government of Ireland (GoI) (2018) *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*