

Environmental Impact Assessment Report

**PROVISION OF A PROPOSED 110KV GAS
INSULATED SWITCHGEAR (GIS) SUBSTATION
ON A SITE TO THE NORTH OF THE EXISTING
KISH BUSINESS PARK, ARKLOW, COUNTY
WICKLOW, AND AN UNDERGROUND 110KV
TRANSMISSION LINE CONNECTION TO THE
EXISTING ARKLOW – BANOGE OVERHEAD
LINES**

Volume 2 – EIA Report

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1.0 INTRODUCTION

1.1 PROPOSED DEVELOPMENT

This Environmental Impact Assessment Report (EIAR) has been prepared by AWN Consulting and specialist subconsultants on behalf of Crag Wicklow Limited herein referred as 'the Applicant' in respect of this strategic infrastructure development (SID to An Bord Pleanála (ABP)). The proposal subject of this planning application forms part of a wider development site for the development consisting of three ICT Facilities and ancillary structures (WCC Reg. Ref.: 201088) as described in Chapter 2, Section 2.8).

The Proposed Development comprises the construction of a 2 storey 110kV Gas Insulated Switchgear (GIS) Substation (intended to be named 'Oaklands'), and installation of two underground single cable circuits originating at the proposed 110 kV Substation and terminating at the existing 110 kV Arklow – Banoge overhead line to the west of the site, and two c. 17 m above ground level connection masts.

The 110 kV Substation development includes all associated and ancillary site development and construction works, services provision, drainage works, connections to the substations, all internal road/footpath access routes, landscaping and boundary treatment works, vehicular access onto the private road to the south of the site and provision of 9 no. spaces in the overall compound.



Figure 1.1 Proposed Development Lands (indicative boundary in red) (Source: Google Earth)

The Proposed Development is located on a Site with a total area of c. c. 8.68 hectares (ha) of predominantly agricultural land and is located in the townlands of Kish, Bogland, Ballynattin, and Ballintombay, to the south of Arklow, County Wicklow. The Site area consists of three main areas: 110 kV Substation Site, Circuit Route A, Circuit Route B.

A detailed description of the Proposed Development and associated and ancillary site development is presented in: Chapter 2 (Description of Development), and the included planning documentation. This EIA Report should be read in conjunction with full application package that includes complete elevations and floor plans site, layout plans including utilities and building drawings.

While the applicant is Crag Wicklow Limited, EirGrid will be the transmission system operator (TSO). EirGrid operate the flow of power on the grid and plan for its future, while ESB Networks (the TAO) is responsible for carrying out maintenance, repairs and construction on the grid under the direction of EirGrid. For this development, EirGrid will operate the proposed 110 kV Gas Insulated Switchgear (GIS) Substation, remotely from their control centres. However, ESB Networks will carry out all local operations on EirGrid's behalf. EirGrid and ESB Networks are committed to running their businesses in the most environmentally friendly way possible.

The proposed development as described in the public notices primarily is described as follows:

The proposed 110kV GIS Substation is to be located on lands to the northwest of the ICT facility development permitted under Wicklow County Council Reg. Ref.: 20/1088, within an overall landholding bound to the south / southwest by the existing Kish Business Park, to the southeast by dwellings and Kish Road, to the west by the Dublin-Rosslare railway line (beyond which is the R772 and the M11), and to the east and north by agricultural lands.

The proposed substation compound is subdivided into two parts. The southern part of the compound will accommodate and a two storey 110kV GIS substation building (with a gross floor area of c. 1,299 sq.m). The northern part of the compound will accommodate four transformers and a single storey client control building (with a gross floor area of c. 419 sq.m) and associated underground services. Both parts of the substation compound are enclosed within c. 2.4 metre high security fencing.

The proposed dropdown 110kV transmission lines will connect the proposed 110kV GIS substation building to existing 110kV overhead transmission lines to the northwest of the proposed substation (the Arklow Banoge 110kV overhead line) and will comprise the provision of two dropdown masts (c. 17 metres in height) and associated overhead transmission line connections, transitioning to underground transmission lines set within ducts that will subsequently progress into the 110kV GIS substation building.

The proposed 110kV transmission line will primarily run through undeveloped lands, agricultural lands, and via public roads between the proposed 110kV GIS substation and existing Arklow – Banoge overhead lines to the northwest of the site.

The transmission lines form a loop that will be divided into two circuits, Circuits A and B. Proposed Circuit A proceeds from the site of the proposed 110kV GIS substation westwards, crossing the nearby railway line, then proceeds south-west along the R772 to cross the Moneylane Stream and

crosses underneath the M11 motorway at Junction 21, then proceeds along the L6187, enters agricultural lands adjacent to Knockeneahan Road, and terminates at the existing 110 kV Arklow – Banoge overhead line. Proposed Circuit B proceeds from the site of the proposed 110kV GIS substation westwards, crossing the nearby railway line, the Moneylane Stream, the R772, and the M11, then traverses lands within the Arklow IDA Business Park, and open agricultural lands adjacent to the M11 and Knockeneahan Road (L2190) and terminates at the existing 110 kV Arklow – Banoge overhead line.

The development includes adjacent access paths, connections to the substation and to the overhead lines, removal of redundant overhead lines, landscaping and landscape screening to the proposed GIS substation compound, security fencing, provision of internal access roads and car parking (9 no. spaces) within the substation compound, services, all associated construction works, and all ancillary works.

1.2 RELEVANT LEGISLATIVE REQUIREMENT FOR ENVIRONMENTAL IMPACT ASSESSMENT

Environmental Impact Assessment is an essential tool in the implementation of EU environmental legislation. According to the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018) the objective of the Directive (Directive 2011/92/EU), as amended by Directive 2014/52/EU, is to ensure a high level of protection of the environment and human health, through the establishment of minimum requirements for environmental impact assessment (EIA), prior to development consent being given, of public and private developments that are likely to have significant effects on the environment.

The requirement for EIA Report is set out in the EIA Directive (Directive 2011/92/EU as amended by 2014/52/EU); the EIA Directives have been transposed into existing Irish planning consent procedures i.e. the *Planning and Development Act 2000 as amended* (the Act) and *Planning and Development Regulations, 2001 as amended* (the Regulations).

The EIA Directive lists projects for which an EIA is mandatory (Annex I) and those projects for which an EIA may be required (Annex II) of the EIA Directive (2011/92/EU and 2014/52/EU), these Annex are transposed into Schedule 5 of the *Planning and Development Regulations 2001 as amended*. The EU Member States can choose to apply thresholds for Annex II projects or use a case-by-case examination, or a combination of both, to assess where EIA is required. In Ireland, a combination of both has been applied.

Ireland's type of projects for which an EIA is mandatory is set out in the Schedule 5 Part 1 and Part 2 of the Regulations. The EPA Guidance (2017) requires an assessment beyond the general description of the project and to consider the component parts of the project and/or any processes arising from it. In considering the wider context and the component parts of the Proposed Development

An EIA Report has been provided for the Proposed Development as this will provide the permanent power supply for the permitted development for three ICT Facility Buildings and ancillary structures (WCC Reg. Ref.: 201088) that was accompanied by an EIA Report. The proposed development is fundamental to the three ICT Facility Buildings and this EIA Report has been prepared to engage with the requirement for

cumulative assessment, and form an expert view, if the proposed development is likely to give rise to significant cumulative or other impacts.

1.3 FORMAT OF THIS ENVIRONMENTAL IMPACT ASSESSMENT REPORT

This EIA Report has been prepared in accordance with the most relevant guidance and legislation, including the following:

- EIA Directive (2011/92/EU) as amended by EIA Directive (2014/52/EU)
- Planning and Development Act 2000 (as amended)
- Planning and Development Regulations 2001 (as amended)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018)
- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2017)
- Guidance on the preparation of the Environmental Impact Assessment Report (European Union, 2017)
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015)

This report has been laid out using the grouped format structure, the EIA Report examines each environmental factor in a separate chapter (the chapters are listed in Table 1.1). The EIA chapters have been prepared by a suitably qualified expert(s) and have considered the construction and operational phases of the Proposed Development under the following headings:

- Assessment Methodology;
- Receiving Environment;
- Characteristics of the Proposed Development;
- Potential Impacts of the Proposed Development;
- Mitigation Measures;
- Residual Impacts of the Proposed Development
- Monitoring or Reinstatement; and
- Cumulative Impacts of the Proposed Development

While the EIA has the focus on the Proposed Development, each specialist chapters also considers the potential cumulative impact (as far as practically possible) of the Proposed Development with the any future development and the cumulative impacts with developments in the locality (including planned and permitted developments).

1.3.1 Consultation and Scoping

In accordance with Section 182E of the Planning and Development Act 2000 (as amended), the applicant had one pre-planning consultation meetings with An Bord Pleanála (ABP) on 16 February 2022, ABP Ref. ABP-311778-21. The Applicant requested to close consultation on 11 March 2022, ABP confirmed on 28 June 2022 that the Proposed Development would be strategic infrastructure within the meaning of Section 182A of the Planning and Development Act, 2000, as amended.

The application reflects and responds to the points of discussion during the course of the pre-application consultation with ABP.

The scope of the EIAR has been defined at an early stage of the planning process in order to identify and ensure that the environmental studies address all the relevant issues. This included a review of the context of the development site, locality, and previously permitted development, and of the development proposed to identify the matters to be covered within this environmental impact assessment.

The structure, presentation and the non-technical summary of the EIAR, as well as the arrangements for public access, all facilitate the dissemination of the information contained in the EIAR. A core objective is to ensure that the public and local community are aware of the likely environmental impacts of projects prior to the granting of consent.

Informal scoping of potential environmental impacts was undertaken with the Planning Authority through pre-application meetings. Public participation in the EIA process will be affected through the statutory planning application process. Information on the EIAR has also been issued for the Department of Housing, Planning and Local Government's EIA Portal.

A copy of this EIAR document and Non-Technical Summary of the EIAR document is available for inspection and/or purchase at the offices of Fingal County Council (the relevant Planning Authority) at a fee not exceeding the reasonable cost of reproducing the document.

1.3.2 Contributors to the Environmental Impact Assessment Report

The preparation and co-ordination of this EIA Report has been completed by AWN Consulting in conjunction with experienced subject matter experts. Each environmental specialist of the applicants project team was commissioned having regard to their previous experience in EIA; their knowledge of relevant environmental legislation relevant to their topic; familiarity with the relevant standards and criteria for evaluation relevant to their topic; ability to interpret the specialised documentation of the construction sector and to understand and anticipate how their topic will be affected during construction and operation phases of development; ability to arrive at practicable and reliable measure to mitigate or avoid adverse environmental impacts; and to clearly and comprehensively present their findings.

The role and responsibility of each contributor, their qualifications and relevant experience are detailed in Table 1.1 below, along with the corresponding EIA Report chapter.

Table 1.1 Roles and Responsibilities in the EIA Report

Chapter No.	Chapter Title	Consultant
	Non-Technical Summary	AWN – Input from each specialist
Chapter 1	Introduction	AWN – Jonathan Gauntlett
Chapter 2	Description of the Proposed Development	AWN – Jonathan Gauntlett
Chapter 3	Alternatives	AWN – Lorraine Walsh and Jonathan Gauntlett
Chapter 4	Population and Human Health	AWN – Lorraine Walsh and Sarah Tierney
Chapter 5	Land, Soils, Geology and Hydrogeology	AWN – Alan Wilson and Marcelo Allende
Chapter 6	Hydrology	AWN – Alan Wilson and Marcelo Allende
Chapter 7	Biodiversity (including AA Screening Report)	Moore Group – Ger O'Donohoe
Chapter 8	Air Quality and Climate	AWN – Ciara Nolan

Chapter 9	Noise and Vibration	AWN – Mike Simms
Chapter 10	Landscape and Visual	Model Works – David Bolt
Chapter 11	Archaeological, Architectural and Cultural Heritage	CRDS Ltd. – Dr Stephen Mandal
Chapter 12	Material Assets - Traffic and Transportation	CST – Phillip Bayfield
Chapter 13	Material Assets - Waste Management	AWN – Niamh Kelly
Chapter 14	Material Assets - Utilities	AWN – Sarah Tierney and Jonathan Gauntlett
Chapter 15	Interactions	AWN – Input from each specialist

EIA Co-ordinator/Selected Chapters, Jonathan Gauntlett Jonathan is a Principal Environmental Consultant in AWN Consulting with ongoing roles in impact assessment, licensing, environmental compliance and project management. Recent projects include; Strategic Housing Development including EIAR and EIA Screening Reports, SID and planning applications for ICT facilities; EPA Licence applications for biopharma and ICT facilities. Jonathan has over 10 years' experience in environmental compliance, planning and management of Environmental Impact Assessments, licensing, and urban planning. Jonathan has a BSocSc (Environmental Planning) and BBA (Economics) from the Waikato University in New Zealand and has experience working in the environmental consultancy, planning, and regulatory fields from Ireland, the UK and New Zealand.

Alternatives, Lorraine Walsh. Lorraine holds a BSc Hons (Environmental Management) and recently joined AWN Consulting as a Senior Environmental Consultant. Lorraine brings over 8 years' experience from the manufacturing and waste industries in environmental compliance, EPA IED/IPPC licenses, waste management, environmental consultancy, and ISO compliance. Lorraine has helped prepare specialist inputs in numerous EIAR's for large scale developments nationwide.

Human Health and Populations Lorraine Walsh and Sarah Tierney. Sarah is an Environmental Consultant with AWN Consulting, working on projects involving EIA Reports, EIA screening and EPA licence applications for a range of developments, such as pharmaceutical plants and ICT facilities. She holds a BA in Environmental Science from Trinity College Dublin and is a member of the Environmental Sciences Association of Ireland.

Land, Soils, Geology, Hydrogeology and Hydrology, Marcelo Allende and Alan Wilson. Marcelo is an Environmental Consultant at AWN with over 15 years of experience in Environmental Consulting and water resources. Marcelo holds a degree in Water Resource Civil Engineering from the University of Chile. He has worked on a wide of range of projects including multi-aspect environmental investigations, groundwater resource management, hydrological and hydrogeological conceptual and numerical modelling, due diligence reporting, surface and groundwater monitoring and field sampling programmes on a variety of brownfield and greenfield sites throughout Ireland as well as overseas in Chile, Argentina, Peru and Panama. Alan is an Environmental Consultant at AWN. Alan holds a BSc Honours in Environmental Management in Agriculture/ Environmental and Geographical Sciences. working on projects involving EIA Reports, Environmental Site Investigation, and contaminated lands a range of developments. Alan has over 2 years experience as an Environmental Consultant including roles in Ecology and Forestry related work.

Biodiversity/Appropriate Assessment, Ger O'Donohoe. Ger is a Consultant Ecologist with Moore Group. Ger graduated from GMIT in 1993 with a B.Sc. in Applied Freshwater and Marine Biology and completed an M.Sc. in Environmental Sciences,

graduating from TCD in 1999. Ger has over 20 years of experience as an environmental consultant with experience in the planning and management of numerous complex Environmental Impact Assessments for large scale developments nationwide. He has wide ranging experience as an expert witness at public hearings.

Air Quality & Climate, Ciara Nolan. Ciara is an Environmental Consultant with AWN specialising in the field of Air Quality. She holds a BSc (Hons) in Energy Systems Engineering from University College Dublin and has also completed an MSc in Applied Environmental Science at UCD. She is an Associate Member of the Institute of Air Quality Management. She specialises in the fields of air monitoring, air dispersion modelling and EIA. She has been active in the field of air quality for 3 years with a primary focus on consultancy.

Noise and Vibration, Mike Simms, is a Senior Acoustic Consultant with AWN and holds a BE and MEngSc in Mechanical Engineering, and is a member of the Institute of Acoustics (MIOA) and of the Institution of Engineering and Technology (MIEI). Mike has worked in the field of acoustics for over 20 years. He has extensive experience in all aspects of environmental surveying, noise modelling and impact assessment for various sectors including, wind energy, industrial, commercial, and residential.

Landscape and Visual, David Bolt (Ba(Hons) CMLI). David is a LVIA specialist at Model Works Ltd. He is a Chartered Member of the Landscape Institute of UK, expert witness and PRINCE2 qualified project manager. He has over 30 years' experience in development and environmental planning in environmental planning, project feasibility assessment, master planning and landscape design.

Archaeological, Architectural and Cultural Heritage, Dr Stephen Mandal holds an honours degree in Science (Geology) from Trinity College Dublin (1991) and a PhD in Geoarchaeology, also from Trinity College Dublin (1995). Following two years as a post-doctoral researcher in University College Dublin, he founded CRDS Ltd (established in 1997; incorporated in 1999), archaeological, cultural and architectural heritage consultants. As one of Ireland's leading heritage consultancies for almost 25 years, CRDS has employed over 600 archaeologists, undertaken some of the largest and most significant archaeological excavations throughout Ireland, and has won numerous national and international awards. He has overseen the writing of the Archaeology, Architectural and Cultural Heritage Chapters of in excess of 100 EIARs dating from 1997 to present. This experience covers the island a wide range of development types including small scale developments close to culturally sensitive sites, large scale developments and liner developments including roads, ESBI power lines, railways and cycle paths.

Traffic and Transportation, Phillip Bayfield (BE MSc CEng MIEI MICE). Phillip is a Chartered Engineer with over 30 years' experience in the industry. He has overseen civil and structural engineering design of variety of projects including several road and bridge schemes, commercial, educational, public and residential buildings as well as works in the public domain and has been responsible for project team management, resourcing, programming and account management. Projects include the Sutherland School of Law Enabling Works Contract on behalf of UCD, Thornton Hall Access Road and Thornton Hall Offsite Works projects on behalf of the Irish Prison Service, Scotch Hall Development, Kildare Civic Offices infrastructure and Beacon Gateway. Philip is also an experienced PSDP coordinator.

Material Assets - Waste Management, Niamh Kelly is an Environmental Consultant in the waste management section of AWN and an Affiliate Member of the Chartered Institute of Waste Management (CIWM). She holds an MSc in International Disaster

Management from the University of Manchester and a B.A. in Earth Sciences from Trinity College Dublin. She has prepared the Waste EIAR chapter for various developments including residential, commercial and industrial.

Material Assets - Utilities, Sarah Tierney

1.4 DESCRIPTION OF EFFECTS

The quality, magnitude and duration of potential impacts are defined in accordance with the criteria provided in the *Guidelines on Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017) this criteria is duplicated in Table 1.2.

Table 1.2 Schedule of Impacts following EPA Guidelines

Characteristic	Term	Description
Quality of Effects	Positive	A change which improves the quality of the environment
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment
Describing the Significance of Effects	Imperceptible	An impact capable of measurement but without noticeable consequences
	Not significant	An effect which causes noticeable changes in the character of the environment but without noticeable consequences
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities
	Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.
	Profound	An impact which obliterates sensitive characteristics
Describing the Extent and Context of Effects	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, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Describing the Probability of Effects	Likely Effects	The effects that can reasonably be expected to occur as a result of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects	Momentary Effects	Effects lasting from seconds to minutes
	Brief Effects	Effects lasting less than a day
	Temporary Effects	Effects lasting less than a year
	Short-term Effects	Effects lasting one to seven years.
	Medium-term Effects	Effects lasting seven to fifteen years

Characteristic	Term	Description
	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)
Type of Effects	Indirect Effects	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do Nothing'	The environment as it would be in the future should no development of any kind be carried out
	'Worst case' Effects	The effects arising from a project in the case where mitigation measures substantially fail
	Indeterminable	When the full consequences of a change in the environment cannot be described
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect
	Synergistic	Where the resultant impact is of greater significance than the sum of its constituents

1.5 ADDITIONAL ASSESSMENTS REQUIRED

The additional reports and/or assessments required under Legislation or EU Directives other than the Environmental Impact Assessment Directive in respect of the Proposed Development are described below.

1.5.1 The Floods Directive (Directive 2007/60/EC)

The Floods Directive (Directive 2007/60/EC) establishes a framework for the assessment and management of flood risks, with the aim to reduce the adverse consequences on human health, the environment and material assets.

The Site-Specific Flood Risk Assessment (FRA) that has been prepared by AWN Consulting in accordance with the Planning System and Flood Risk Management Guidelines for Local Government (2009) is included as Appendix 6.2 to Chapter 6 (Hydrology).

1.5.2 Habitats Directive (Directive 92/43/EEC) and Birds Directive (Directive 2009/147/EC)

The main EU legislation for conserving biodiversity is the Directive 2009/147/EC of the European Parliament and of the Council of November 2009 on the conservation of wild birds (Birds Directive); and the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive).

The environmental sensitivity of the Proposed Development site in respect of Natura 2000 sites designated pursuant to the Habitats Directive and the Birds Directive been

considered with reference to the application Appropriate Assessment Screening which comprises an initial impact assessment of a project; examining the direct and indirect impacts that it might have on its own or in combination with other plans and projects, on one or more Natura 2000 sites in view of the sites' conservation objectives.

The Appropriate Assessment (AA) Screening that has been prepared for the Proposed Development by Moore Group and is included as Appendix 7.1 to Chapter 7 (Biodiversity).

2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 INTRODUCTION

This chapter presents the description of the project comprising information on the Site, design, size and other relevant features of the Proposed Development. The scope of this chapter aligns with the legalisation and guidance material as set out in the EIA Directive (2011/92/EU) as amended by EIA Directive (2014/52/EU), as well as the relevant EPA guidance documents *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022), *European Commissions Guidelines, Guidance on the preparation of the Environmental Impact Assessment Report* (2017), and *Draft Advice Notes for Preparing Environmental Impact Statements* (EPA, 2015).

This chapter summarises the existing site, the Proposed Development, and the existence of the project as set out within the *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022). This guidance advises that description of the existence of the project should define all aspects of the proposed lifecycle of the facility, including:

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

This chapter draws on and has been informed by the Project Design and summarises the key relevant details of the Proposed Development and its lifecycle as it relates to EIA Report.

This description is not exhaustive, and as such the EIA Report should be read in conjunction with full application package that includes complete elevations and plans, layout plans including utilities and building drawings. The description of the Proposed Development is described in this chapter in terms of those environmental topics that will form the basis of the impact assessment process and the characteristics of the Proposed Development and potential effects. The specialist assessments reported in this EIA Report have been conducted using this description, and the full application package as a guide to the details of the development under consideration.

2.2 DESCRIPTION OF THE EXISTING DEVELOPMENT SITE

The Proposed Development is located on a Site with a total area of c. 8.68 hectares (ha) of predominantly agricultural land and is located in the townlands of Kish, Bogland, Ballynattin, and Ballintombay, to the south of Arklow, County Wicklow. The Site area consists of three main areas: 110 kV Substation Site, Circuit Route A, Circuit Route B; these areas are described below.

The first area, the '110 kV Substation Site', is located within the Kish Business Park and comprises part of an irregularly shaped field bounded by hedgerows typical of its agricultural setting. The 110 kV Substation Site is currently in use as agricultural lands. To the south of the 110 kV Substation Site is Armstrong Timber Engineering, there are agricultural lands to the north and east, and the Dublin-Rosslare rail line, R772, and

M11 are located to the west. The 110 kV Substation Site benefits from a strategic location and is accessible from the M11 via the local road network (R772) at Junction 21 approximately 700 metres to the south west. The 110 kV Substation Site is presently bounded by greenfield agricultural lands to the north and east, which are subject to permitted development for a 3 no. ICT Facility Buildings and associated development under Wicklow County Council (WCC) Reg. Ref.: 201088 (hereafter referred to as the 'Permitted ICT Facility'). The 110 kV Substation Site is can currently be accessed via the existing accesses via Kish Business Park Road.

The second area, the 'Circuit Route A', is a linear route of 2,888 m; between the 110 kV Substation Site to the existing 110 kV Arklow – Banoge overhead line located to the west. This route crosses perpendicular to the Dublin-Rosslare rail line, then follows the R772 to cross the culverted Moneylane Stream and underneath the M11 motorway at Junction 21, then traverses along the L6187, enters agricultural lands at Knockeneahan Road (L2190), and terminates at the existing 110 kV Arklow – Banoge overhead line. Circuit Route A is generally surrounded by agricultural lands, as well as some once-off developments associated with these agricultural holdings. The off-road areas of Circuit Route A can be accessed via existing agricultural or private road access points.

The third area, the 'Circuit Route B', is a linear route of 2,164 m; between the 110 kV Substation Site to the existing 110 kV Arklow – Banoge overhead line located to the west. The route crosses perpendicular to the Dublin-Rosslare rail line, the Moneylane Stream, R772, M11, then traverses an IDA Business Park, and open agricultural lands adjacent to the M11 and Knockeneahan Road (L2190) and terminates at the existing 110 kV Arklow – Banoge overhead line. Circuit Route B is generally surrounded by the IDA Business Park, and agricultural lands, as well as some once-off developments associated with these agricultural holdings. The off-road areas of Circuit Route B can be accessed via existing agricultural access points.

The wider area is characterised by predominantly agricultural uses, as well as some one-off developments associated with these agricultural holdings, there are few commercial light industrial developments within the wider area. To the north east of the Site (approximately 400 m from the 110 kV Substation Site) is the Moneylands Farm B&B and café, and to the north-west is Servier (Ireland) Industries Ltd, To the east of the site is the Roadstone Arklow quarry, and further to the east the Irish sea.

The proposed site is connected by road to the southern end of Arklow where residential areas including Meadowvale and The Maples lie. These residential areas, approximately 2 km from the site, and buffer the town centre and port facilities from the zoned employments areas.

The county town of Wicklow is located approximately 25 km north, with Dublin city centre 65 km further to the north of the site. The M11 motorway provides an excellent transport link to the surrounding area.

The Moneylane Stream is situated to the west of the 110 kV Substation Site and flows in a northerly direction. The 110 kV Substation Site and Permitted ICT Facility is drained by a series of agricultural ditches which connect to the Moneylane Stream and ultimately discharges into the Avoca River.

The current EPA watercourse mapping shows an existing stream called Springfield within the 110 kV Substation Site, however this feature is not shown in any of the old records provided within the GeoHive website. It has been determined that, this feature is likely a surface water drainage feature that has developed over time along the

historic laneway, rather than a pre-existing natural watercourse. This is discussed further in Chapter 6 (Hydrology).



Figure 2.1 Proposed Development Lands (Red boundary)

2.2.1 Electricity, Potable Water, Surface Water, Foul Wastewater, and Telecommunications during construction

Currently there is no significant electrical supply on site. The proposed Cable Circuits and Drop Down Mast will provide a loop in / loop out to the existing 110 kV Arklow – Banoge overhead line to the northwest of the Substation site.

Along the route of Cable Circuits A and B there is an existing watermain network traversing along the existing Regional Road R772, M11, through the existing Arklow Business Park and Kish Business Park.

There is no existing public surface water infrastructure available on the 110 kV Substation site. Along the routes of Cable Circuits A and B there are existing surface water control networks traversing the L6187, R772 and M11 roads, the Irish Rail railway line and through the Kish Business Park.

There is no existing public foul network at the Substation site, properties in the adjacent development to the Substation Site within Kish Business Park treat their wastewater on site.

There are telecommunication lines in existence for telephone and broadband services in the area and fibre provisions for the Proposed Development.

2.2.2 Seveso and COMAH SITES

The Chemical Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I. 209 of 2015) or 'COMAH' regulations define the "consultation distance" as a distance or area relating to an establishment, within which there are potentially significant consequences for human health or the environment from a major accident at the establishment, including potentially significant consequences for developments such as residential areas, buildings and areas of public use, recreational areas and major transport routes.

Establishments are either lower tier establishments or upper-tier COMAH sites with above threshold quantities of dangerous substances present, and to which the provisions of the COMAH regulations apply. The Proposed Development does not meet the thresholds for either lower or upper tier.

The Health and Safety Authority (HSA) list of Notified Seveso Establishments has been reviewed to identify any facilities within the lands surrounding the development site. There are no Notified Seveso Establishments listed within the general vicinity.

The Proposed Development site is not located within the consultation distance of any notified establishment. Therefore, there are no implications for major accidents or hazards at the Proposed Development site.

2.2.3 Industrial Emissions Licenced Facilities

According to the EPA (2022) there are two licensed IE/IPPC facilities in the immediate vicinity of the site and one waste facility. Information of this is shown in Table 2.1.

Table 2.1 EPA Licenced facilities nearby to the Proposed Development site

Registration number	Name	Category	License type	Distance (km)
P0031	Avoca Park River Limited	Industry	IPPC	4
P0089	Sigma-Aldrich Ireland Limited	Industry	IEL	3.3
W0011	Ballymurtagh Landfill Facility	Waste	Waste	11.4

2.2.4 Wicklow County Development Plan(s)

The *Wicklow County Development Plan 2016-2022*, and the *Adopted Wicklow County Development Plan 2016-2022* (Plan will come into effect on the 23 October 2022), and *Arklow and Environs Local Area Plan 2018-2024* zoning designations have been reviewed.

The 110 kV Substation Site lands are zoned *E Special – Special Employment* under the *Arklow and Environs Local Area Plan 2018-2024*. E Special zoning is to facilitate opportunities for large, single, undivided employment development, with a given example being significant IT developments. The surrounding E Special zoned lands are currently still in use as agricultural lands. The Proposed Cable Routes and Masts predominantly run along existing roads and through an area to the northwest with no zoning designation. The *Arklow and Environs Local Area Plan 2018-2024* zoning is shown in Figure 3.2 below.

The location of the Permitted ICT facility in Wicklow County, provides a key component in the support of local employment and provides an anchor for attracting foreign investment or multinationals interested in large scale IT. This allows for the continued

growth experienced in the area, and Arklows position as a growth town for the surrounding environs of south County Wicklow.

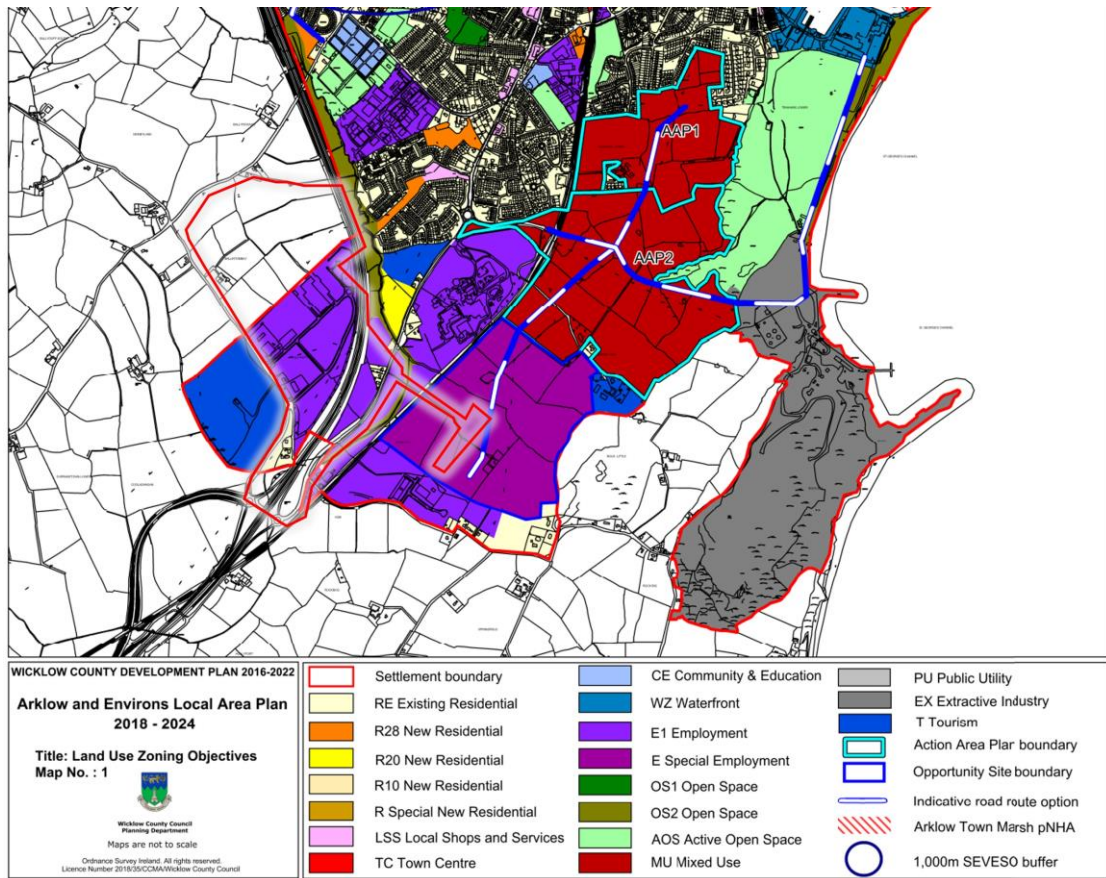


Figure 2.2 Arklow Local Area Plan Zoning (representative site outline only)

Table 2.2 Zoning Objectives

Zoning	Objective	Description
E Special Employment	To provide for a large, single, undivided employment development.	To facilitate the development of a particular type of employment provision, that is, to provide for large, single, undivided employment development, such as 'direct foreign investment' businesses and would be likely to appeal to multinationals or significant IT / green technology / pharmaceutical industries.
E1: Employment	To provide for the development of enterprise and employment	To facilitate the further development and improvement of existing employment areas and to facilitate opportunities for the development of new high-quality employment and enterprise developments in a good quality physical environment.

2.3 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The Proposed Development consists of three main components the 110 kV Substation Site, Circuit Route A, Circuit Route B these areas are described below.

Proposed 110 kV Gas Insulated Switchgear (GIS) Substation

Construction of a 2 storey 110 kV Gas Insulated Switchgear (GIS) Substation (intended to be called 'Oaklands Substation') that would be located on lands at Kish and Boglands, to the south of Arklow, County Wicklow. The proposed substation compound is subdivided into two parts. The southern part of the compound will accommodate a two storey 110 kV GIS substation building (with a gross floor area of c. 1,299 sq.m, overall height of c. 14.5 m). The northern part of the compound will accommodate four transformers and a single storey client control building (with a gross floor area of c. 419 sq.m, height of c. 6 m) and associated underground services. Both parts of the substation compound are enclosed within c. 2.4 metre high security fencing. The development includes site infrastructure, fire walls (c. 10 m high), drainage works, all internal road/footpath access routes, landscaping and boundary treatment works, vehicular access and provision of 9 no. car parking spaces in the overall compound. Disabled parking spaces and electric car charging ports are not proposed due to occupancy and usage of the substation. The proposed 110 kV Substation and underground grid connection will serve the permitted ICT Facility permitted under WCC Reg. Ref.: 201088.

The proposed Oaklands 110 kV Substation layout is shown on Figure 2.2 below.

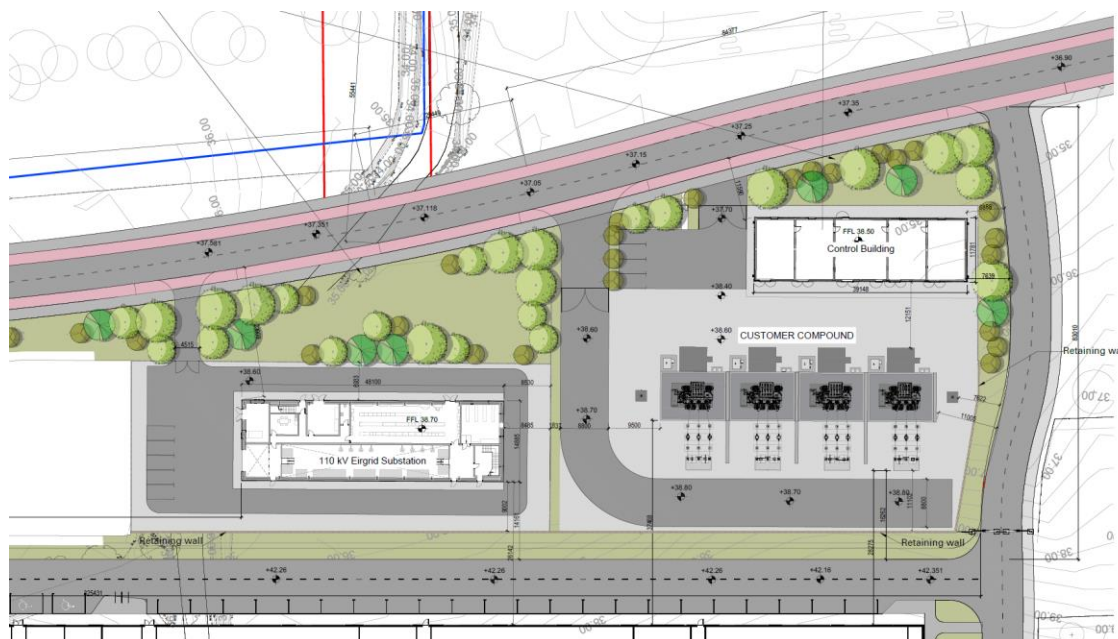


Figure 2.3 110 kV Substation Site Layout (Reddy Architects: DUB30-02-ZZZ-L00-DR-RAU-AR-1004)

Cable Circuits and New Masts

The underground cable (Cable Circuit A) is a single circuit 110 kV cable and communications ducts and 5 joint bays that will follow a liner route of 2,888 m; originating at the proposed 110 kV Substation and terminating at the existing 110 kV Arklow – Banoge overhead line. The 2,888 m route can be summarised as approximately:

- extending to the north-west c. 434 m from the proposed 110 kV Substation including a 103 m horizontal directional drilling (HDD) crossing under the Dublin-Rosslare rail line via.

- c. 800 m in the existing carriageway ducting along the R772 to the M11 Junction 21
- c. 300 m in carriageway through the M11 Junction 21
- Proceeding to the northwest c. 1,400 m in the existing carriageway along the L6187.
- At the terminus the cable connects to the existing 110 kV Arklow – Banoge overhead line via a proposed c. 17 m above ground level lattice mast adjacent to Knockeneahan Road (L2190).

The underground cable (Cable Circuit B) is a single circuit 110 kV cable and communications ducts and 4 joint bays that will follow a liner route of 2,164 m; originating at the proposed 110 kV Substation and terminating at the existing 110 kV Arklow – Banoge overhead line. The 2,164 m route can be summarised as approximately:

- extending to the north-west c. 416 m from the proposed 110 kV Substation including a 103 m horizontal directional drilling (HDD) crossing under the Dublin-Rosslare rail line via.
- 158 m in farmland crossing, and carriageway ducting along the R772
- 142 m under the M11 via HDD
- 600 m in private road (IDA), and future development lands (IDA)
- 900 m in farmland
- At the terminus the cable connects to the existing 110 kV Arklow – Banoge overhead line via a proposed c. 17 m above ground level lattice mast adjacent to Knockeneahan Road (L2190).

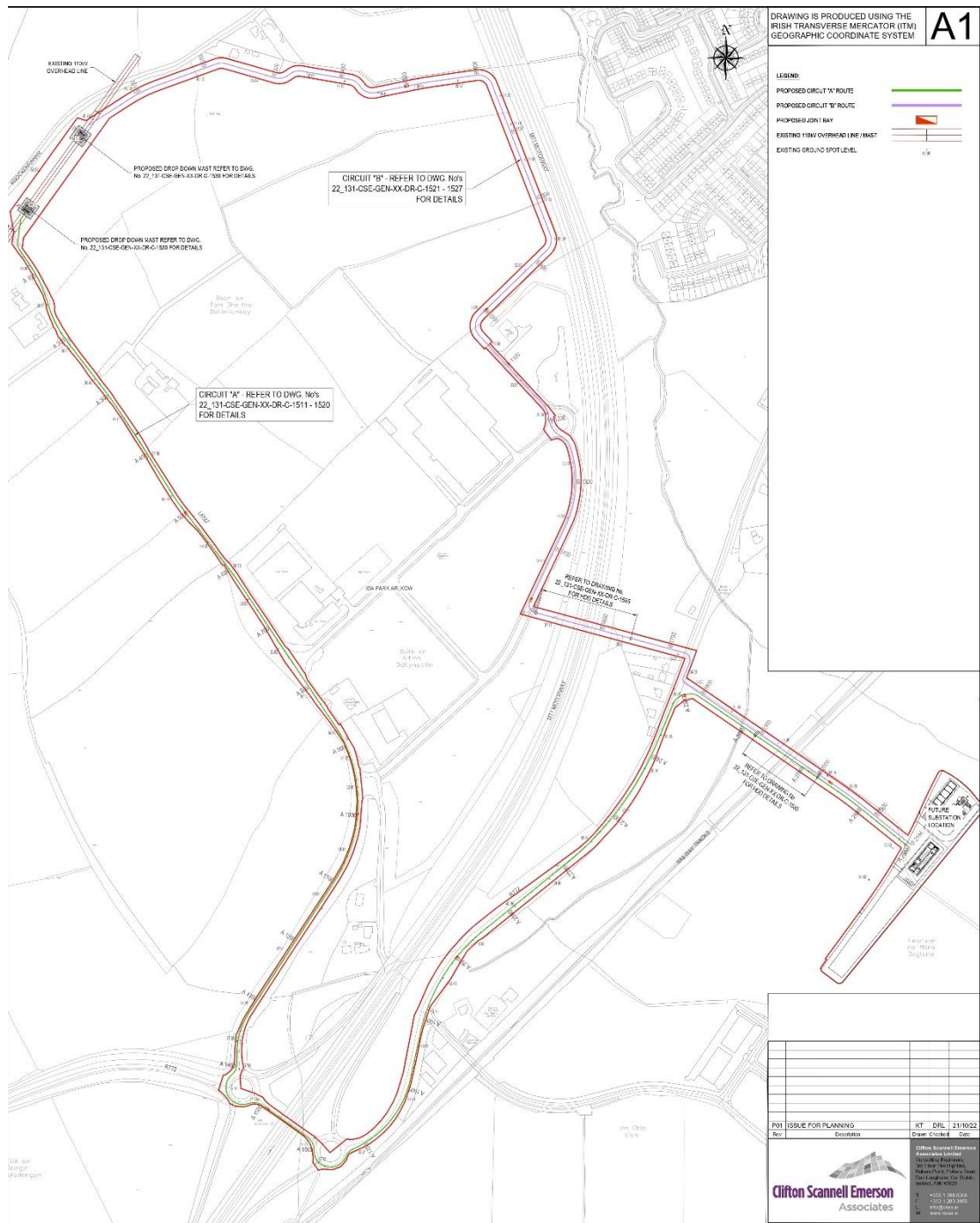


Figure 2.4 Cable Circuit Site Layout (CSEA Sheet: 22_131-CSE-GEN-XX-DR-C-1510)

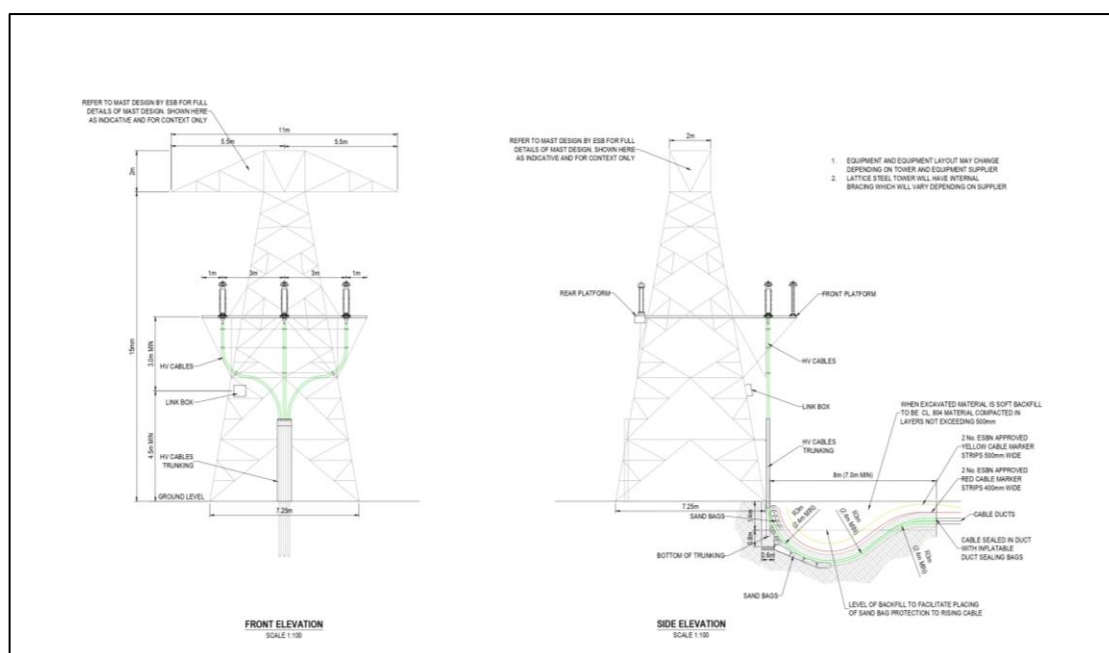


Figure 2.5 Typical lattice mast detail (CSEA Sheet: 1530)

2.3.1 Access, Roads and Parking

Access Arrangements

The 110 kV Substation site is located close to the M11, and the R772 and is currently accessible from Clogga Road. There is an existing two-way road from the Kish Business Park to the proposed site boundary (although no formal access); this road includes a 2 m wide pedestrian footpath and 2.5 m grass verge on both sides.

During construction a temporary access will be established for the 110 kV Substation from the Kish Business Park Road terminus at the western site of the site. It is proposed that the accesses and haul roads for vehicles, the contractors' compound and fencing will be utilised for all development on the main site.

The Cable Circuits and Masts are predominantly on public lands or accessed via existing agricultural entrances on the local road network.

It is proposed that during operation the 110 kV Substation will be accessed via controlled entry on the permitted inner relief road under WCC Reg. Ref. 201088, from the Kish Business Park road terminus at the western site of the site. This road will be adjacent to Armstrong Engineering and accessed via Clogga Road.

Access arrangements and potential traffic safety impacts are considered in Chapter 12 (Traffic and Transportation) of this EIAR.

Car and Cycle Parking

Car parking for 9 cars will be provided adjacent to the proposed 110 kV GIS substation. This is to allow for parking for full time staff as well as external staff, maintenance contractors and visitors attending the Proposed Development.

For further details on car parking rational see Chapter 12 (Traffic and Transportation) of this EIA Report and the application architectural and civils drawings provided.

2.3.2 Electricity, Potable Water, Surface Water, Foul Wastewater, and Telecommunications

The proposed 110 kV Substation and the cable connections are designed to support power demand for the three ICT Facilities previously permitted under WCC Reg. Ref. 201088. The Proposed Development will ultimately be owned and operated by ESB Networks.

The 110 kV Substation site has no direct connection to existing potable water supplies. Along the route of Cable Circuits A and B there is an existing watermain network traversing along the existing Regional Road R772, M11, through the existing Arklow Business Park and Kish Business Park.

There is no public surface water infrastructure located within or adjacent to the site. The 110 kV Substation site is drained by a series of agricultural ditches which connect to the Moneylane Stream which ultimately discharges into the Avoca River. There is a direct pathway from the site to the Moneylane Stream via over land flow that will require appropriate management during construction. The Permitted ICT Facility includes for the removal, infilling and redirection of the existing agricultural ditches that currently drain the site.

There is no existing public foul wastewater network at the site, properties in the adjacent development to the 110 kV Substation site within Kish Business Park treat their wastewater on site.

There are telecommunication lines in existence for telephone and broadband services in the area and fibre provisions for the Proposed Development.

2.4 DESCRIPTION OF CONSTRUCTION

2.4.1 Site Preparation Works and Establishment of Construction Services

Preparation of the site will require limited works with minimal site clearance along the route, establishing entranceways and haul roads for vehicles, surveying and setting out, setting up of the construction site with fencing, and establishment site compounds.

It is proposed that the accesses and haul roads for vehicles, the contractors' compound and fencing that will be established for the construction of the Permitted ICT Facility will be utilised for the Proposed Development.

The site compound will provide office, portable sanitary facilities, equipment storage, parking etc for contractors for the duration of the works. The construction compound will be fenced off for health and safety reasons so that access is restricted to authorised personnel only. All areas under construction will be fenced for security and safety purposes and temporary lighting supplied, as necessary.

The site preparation phase for the GIS substation will involve site clearance, excavations and levelling of the site to the necessary base level for construction, surveying and setting out for structures and any rerouting of services/connections to services.

A combination of bulldozer, excavators, trucks and other soil shifting plant will commence the main site clearance and levelling aspects.

2.4.2 110 kV Substation Construction Works

Levelling/Cut and Fill

It is proposed that some of the spoil generated will be reused under landscaped areas and/or in the formation level for roads and/or the construction compound. Any temporary storage of spoil required will be managed in accordance with a Construction and Environmental Management Plan (CEMP) to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment etc. (refer to Chapter 5 – Land, Soil and Hydrogeology and Chapter 13 – Waste Management of this EIA Report for further details).

For the underground cabling works all excavated material will be temporarily stored adjacent to the trench prior to re-use in the trench reinstatement (where applicable). Stockpiles will be restricted to less than 2 m in height.

The 110 kV Substation site requires a net fill of 22,091 m³. The recontouring of the 110 kV Substation lands will be undertaken as part of the Permitted ICT Facility. The Permitted ICT Facility required a net export of soil / stones. The Proposed Development will therefore utilise cut material from the Permitted ICT Facility site and will not require the importation of fill material.

Foundations, and Structures

Following the completion of site clearance and levelling, the 110 kV Substation will require foundations to structural engineer specifications. Building structures will comprise standard structural steel frames.

The 110 kV Substation and Control Room foundations are proposed to consist of a steel fiber reinforced concrete slab supported on 800 mm x 700 mm deep reinforced concrete beams. These beams are supported on 275 mm x 275 mm driven precast concrete piles. The depth of pile is anticipated to be in the order of c. 9 m below the FFL (subject to detailed design and further exploration of ground conditions) refer to Alan Traynor Consulting Engineers drawings 22-066-200, and 22-066-201 for further details.

Building Envelopes and Finishes

The outer finishing of the building envelopes are intended to be of a similar quality and appearance to the Permitted ICT Facility.

Access Roads, Underground Services, Landscaping

The access road system will be completed as part of the Permitted ICT Facility. Landscaping will be undertaken along the permitted link road to provide screening as set out in Reddy Architects drawing pack include with the application documentation.

Underground foul drainage, surface water networks, including hydrocarbon interceptor will be installed as part of the entailment of services for the Permitted ICT Facility. Full details on surface water drainage design are provided within the report 'Foul & Surface Water Calculations & Details' Water Services Report, prepared by Alan Traynor Consulting Engineers Ltd.

2.4.3 Underground Ducting and Underground Cable Installation

The works include the installation of underground cable ducts via trenching or HDD, and the trench is then reinstated in accordance with landowner specification. The trench will contain c. 5 no. HDPE Ducts. After the installation of the underground ducts the electrical cabling is pulled through the installed ducts in approximately 300 m to 800 m sections. Construction methodologies to be implemented and materials to be used will ensure that the cable is installed in accordance with the requirements and specifications of ESB Networks.

The Contractor and their appointed Site Manager will prepare a targeted Method Statement concisely outlining the construction methodology and incorporating all mitigation and control measures specified in the planning application and accompanying reports, and as required by planning conditions where relevant.

Trenching and Installation of Ducting

The lands where excavations are planned will be surveyed, prior to the commencement of works, with a cable avoiding tool and all existing underground services will be identified. The majority of the proposed Circuit Route A, Circuit Route B can be openly trenched, the trench is typically c. 600 mm wide by c. 1250 mm deep, with variations on this design to adapt to road crossings and watercourse crossings, etc. The excavators will open a trench to the required depth and width. Grade, smooth and trim trench floor, place bedding layer in accordance with the design drawings and specifications and compacted. The ducting will then be placed in the trench as per relevant specifications.

Excavated material will be temporarily stockpiled onsite for re-use during reinstatement where possible. Stockpiles will be restricted to less than 2 m in height. Stockpiles will be located a minimum of 50 m from any surface water features.

The excavated trench will be dewatered if required, from a sump installed within the low section of the opened trench. Where dewatering is required, dirty water will be fully and appropriately attenuated, through silt bags, before being appropriately discharged to vegetation or surface water drainage feature.

The newly installed ducts will be covered in accordance with the design drawings and specifications and compacted. The remainder of the trench will be backfilled with granular material and compacted. The trench will be reinstated as per existing surfacing i.e. landscaped in greenfield area where appropriate.

The proposed underground cable route crosses over Moneylane Stream at two locations using existing structures. Subject to detailed surveys the cable will cross either over or under the existing culvert structures. A typical cross section of the trench is illustrated in Figure 2.7 and Figure 2.8 below.

No more than a 100 m section of trench will be opened at any one time. The excavation, installation and reinstatement process will take place at a rate of c. 100 m per day. Following the installation of ducting, pulling the cable will take approximately 1 no. day between each joint bay, with the jointing of cables taking approximately 1 week per joint bay location.

A typical cross section of the trench is illustrated in Figure 2.6 below. The trenching method is subject to a detailed construction method statement by the construction contractor.

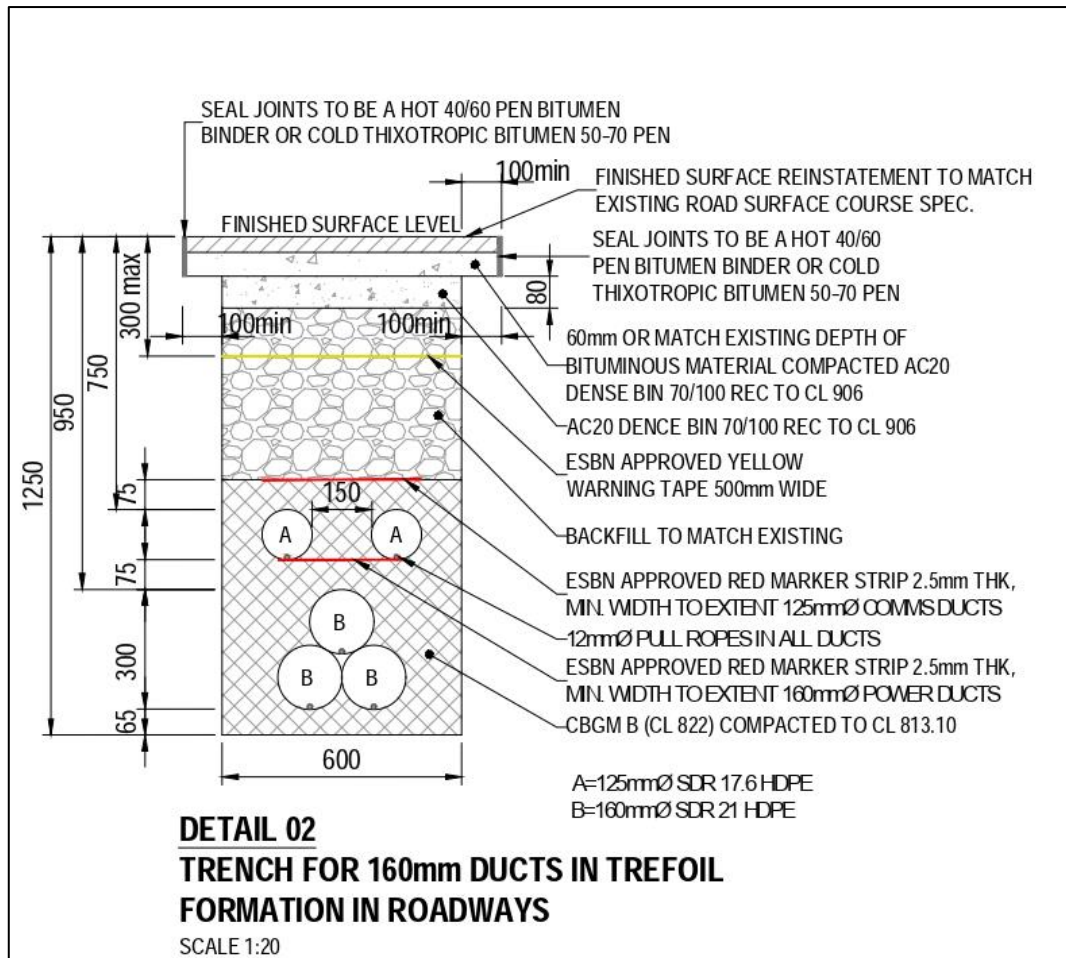


Figure 2.6 Typical Cable Cross Section (CSEA)

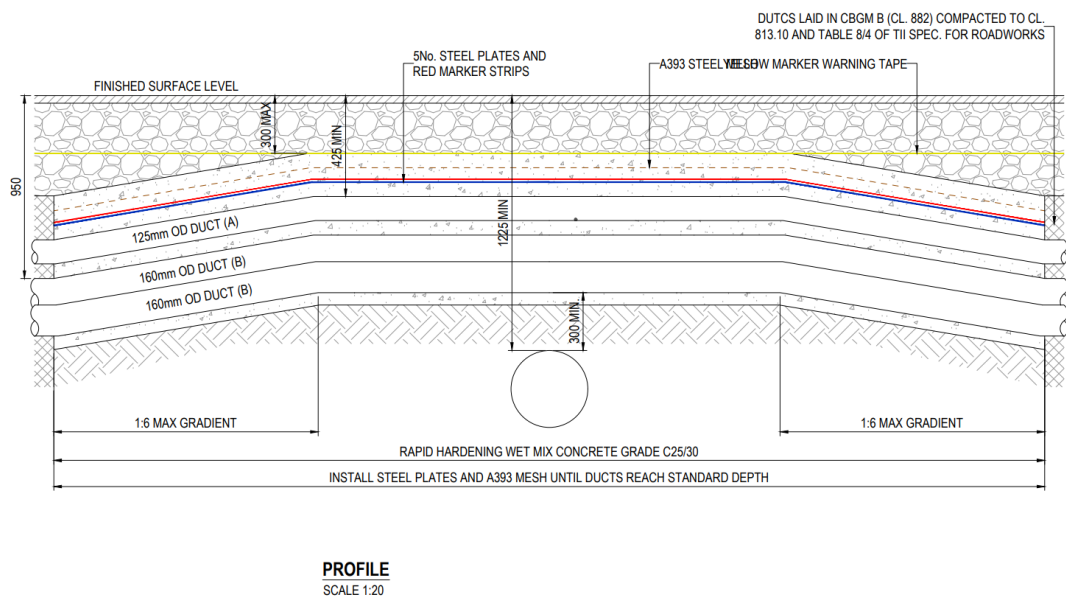


Figure 2.7 Typical overcrossing detail (CSEA sheet: 1544)

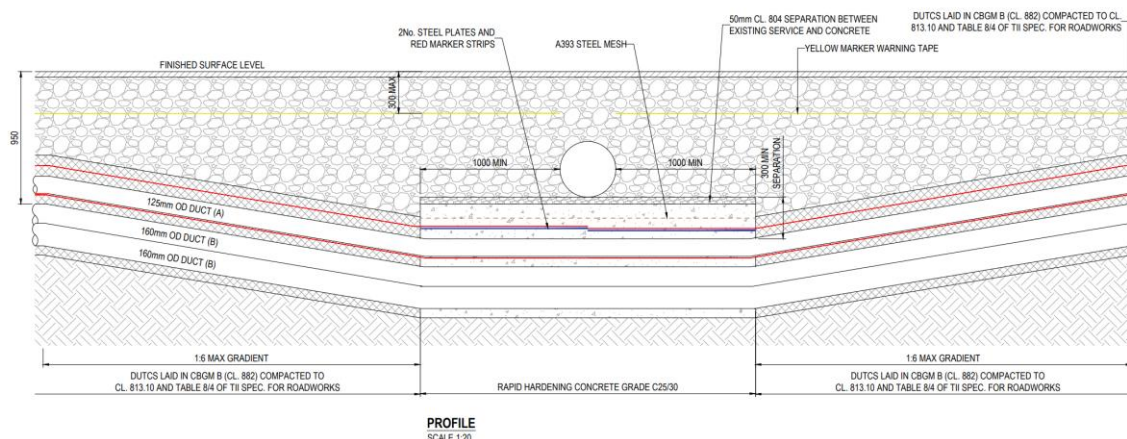


Figure 2.8 Typical undercrossing detail (CSEA sheet: 1545)

Horizontal Directional Drilling and Installation of Ducting

HDD is a method of drilling under obstacles such as bridges, railways, water courses, etc. in order to install cable ducts under the obstacle. The Dublin-Rosslare rail line will require Horizontal Direction Drilling (HDD) to lay the proposed Circuit Route A, Circuit Route B. The HDD will likely launch from the east of the Dublin-Rosslare rail line westwards underneath a stretch of c. 103 m at a maximum depth of c. 6 m the existing rail line. An additional HDD crossing will be required on the M11 for Circuit Route B, the HDD will likely launch from the east of the M11 westwards underneath a stretch of c. 142 m at a maximum depth of c. 6 m the existing motorway.

Entry and exit pits will be established approximately 2 m wide x 2 m long x 2 m deep using an excavator, the excavated material will be temporarily stored within the works area and used for reinstatement or disposed of to a licensed facility. The driller will push the drill string into the ground and will steer the bore path, and the works will be overseen by a surveyor. Once the first pilot hole has been completed, a hole-opener or back reamer will be fitted in the exit pit and will pull a drill pipe back through the bore to the entry side.

Once all bore holes have been completed, a towing assembly will be set up on the drill and this will pull the ducting into the bore. The entry and exit pits will be reinstated to the specification of ESB Networks and the landowner.

Following the installation of ducting, pulling the cable will take approximately 1 no. day for each span of ducting between each joint bay.

A typical cross section of the drill profile is shown in Figure 2.6 below. The exact HDD method is subject to a detailed Construction Method Statement by the construction contractor.

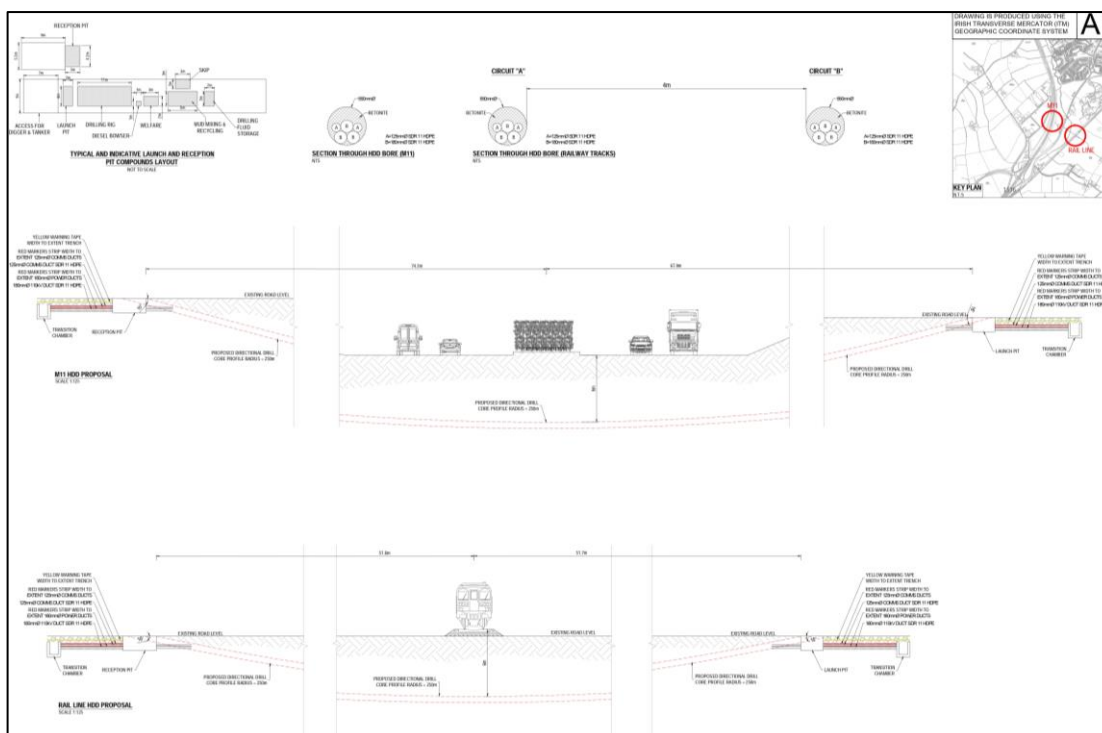


Figure 2.9 HDD Cable Cross Section (CSEA Sheet: 1535)

Joint bays, communication chambers, and link box chambers

Joint bays, communication chambers, and link box chambers are to be installed approximately every 650m - 800m along the proposed UGC route to facilitate the jointing of 2 no. lengths of UGC. Joint bays are typically 2.5 m x 6 m x 0.9 m pre-cast concrete structures installed below finished ground level. The jointing of cables will take approximately 1 week per joint bay location.

Communication chambers and Link Box are required at every joint bay location to facilitate communication links. Earth sheath link chambers and communication Chambers are located in close proximity to joint bays. Earth sheath link chambers and communication chambers are typically pre-cast concrete structures with an access cover at finished surface level.

The precise siting of all joint bays, earth sheath link chambers and communication chambers is subject to approval by ESB Networks. Marker posts will be used on non-roadway routes to delineate the duct route and joint bay positions.

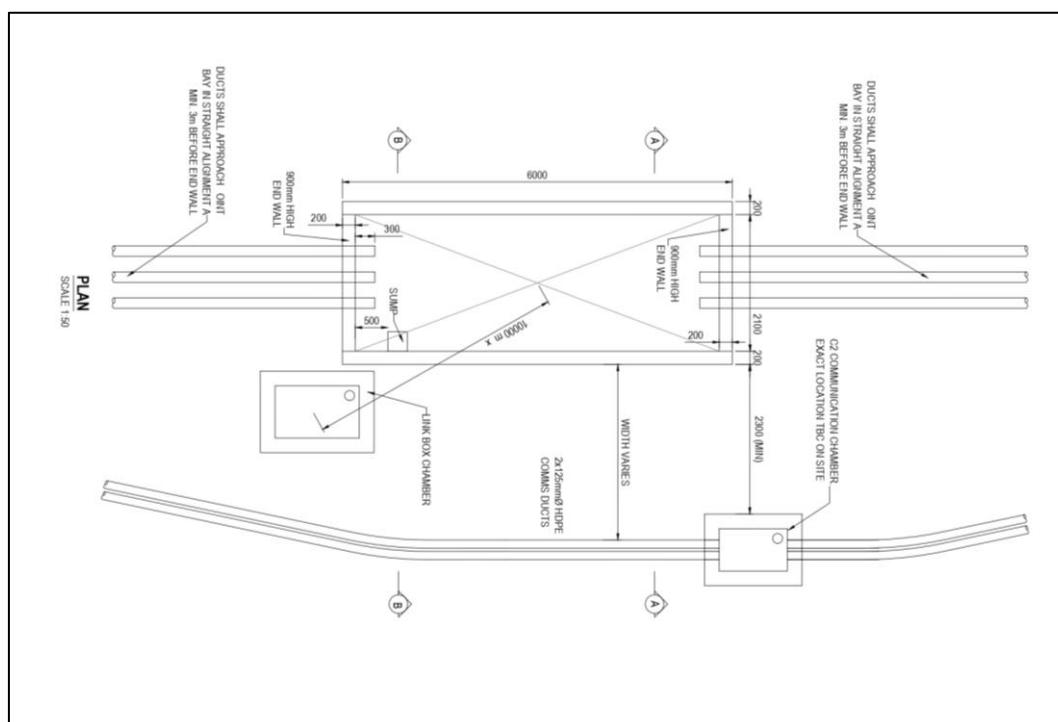


Figure 2.10 Typical Joint Bay Layout (CSEA Sheet: Drawing 1531)

2.4.4 Mast Installation and Connection to Overhead Lines

The proposed new masts will be installed on the site of the connection to the existing 110 kV Arklow – Banoge overhead line, breaking into the existing lines and connect the circuits underground. The works include the installation of two 110 kV lattice masts c. 17 m above ground level.

Construction methodologies to be implemented and materials to be used will ensure that the masts are installed in accordance with the requirements and specifications of ESB Networks.

2.4.5 Removal of Existing Lines (Demolition Works)

Once the proposed Circuit works are completed, cables installed and commissioning works are completed, the removal of a section of the existing overhead line electrical infrastructure between the new masts will be undertaken. The nature of the works means that the demolition and removal of the overhead line electrical infrastructure will commence after the underground line has been installed and commissioned.

2.4.6 Construction Duration

Estimates for the duration of the construction works are included in the table below. The overall start-to-finish duration is estimated to be 12 months with development aspects overlapping. Construction is anticipated to commence in Q3 2023 and be completed by Q3 2024.

No more than a 100 m section of trench will be opened at any one time. The second 100 m will only be excavated once the majority of reinstatement has been completed on the first. The excavation, installation and reinstatement process will take place at a rate of c. 100 m per day.

Table 2.3 Estimated Construction Duration

Work Package	Estimated Construction Duration
Substation and associated works	12 months
Ducting, cabling and mast works	8 months

Each of the following EIAR chapters include, as appropriate, an assessment of the potential impact of construction works on their individual environmental aspect and set out the relevant mitigation measures relating to those aspects.

2.4.7 Construction Staffing and Working Hours

It is anticipated that the construction of the facility will be completed during normal construction hours i.e. 7 am to 7 pm Monday to Friday, and 8 am to 2 pm on Saturdays. However, it is possible that the contractor may wish to carry out certain operations outside these hours i.e. Sunday or evening hours during long summer days etc. Such occurrences will be kept to a minimum and take place over a short timeframe and as such are unlikely to cause excessive disturbance.

It is estimated that there will initially be 15-20 staff on site on a typical day, however during peak construction periods this is expected to fluctuate up to a maximum of 35-60 staff and contractors on site per day. Site staff will include; management, engineers, construction crews, supervisors, environment health and safety personal, and maintenance contractors.

2.4.8 Construction Equipment and Materials

The key civil engineering works will involve the excavation of soil material through the trenching, and HDD works associated with the installation of the underground ducting that will accommodate the cabling. Other construction activities will include site storage of cement and concrete materials, fuels for construction vehicles.

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

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

Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination. Liquid materials will be stored within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications - BS8007-1987) to prevent spillage.

A 'Just in Time' delivery system will operate to minimise storage of materials on site. Key materials will include:

- Steel
- Concrete
- Composite Cladding
- Electrical Cabling
- Architectural Finishes
- Aggregate, Sand, Trench Backfilling Material, Ready-Mix Concrete Etc.;
- HDPE Ducting;

- Precast Chamber Units / Relevant Construction Materials For Chambers;
- Lattice Steel Tower;
- Insulators;
- Dropper Conductors;
- Connection Clamps;
- Surge Arrestors; And
- Electrical Connections.

Typical Construction Equipment:

- Tracked excavator (13 ton normally, 22 ton for rock breaker);
- Tracked dumper or tractor and trailer;
- Soil compactor;
- Winch;
- Crane, Teleporter;
- Chains / small tools, concrete vibrator.

2.4.9 Construction and Environmental Management

Construction Environmental Management Plan (CEMP)

AWN Consulting and the project team have prepared *Outline Construction Environmental Management Plan (CEMP) (2022)* that is included as Appendix 2.1. This outlines and explains the construction techniques and methodologies which will be implemented during construction of the Proposed Development.

Traffic management and road signage will be in accordance with the *Department of Transport: Traffic Signs Manual - Chapter 8: Temporary Traffic Measures and Signs for Road Works*. The Traffic management and road signage will be set out in the project specific Construction Traffic Management Plan (CTMP) prepared by the main contractor and agreed with the local authority.

The CEMP mitigation measures will be implemented to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection.

The CEMP will be implemented and adhered to by the construction Contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. All personnel working on the Site will be trained in the implementation of the procedures.

The construction Contractor will provide a further detailed CEMP that will include any subsequent planning conditions relevant to the Proposed Development and set out further detail of the overarching vision of how the construction Contractor of the Proposed Development manage the Site in a safe and organised manner.

Dust Management Plan

Construction stage dust management mitigation measures are set out in Section 8.6.1 of this EIAR, the suite of measures are designed to control dust at the construction site to ensure that no significant nuisance occurs at nearby receptors, and has been informed by international best practice guidance documents. The plan will be implemented in full during the construction works. For further information, refer to Chapter 8 (Air Quality and Climate).

Noise and Vibration Management

With regard to construction activities, reference will be made to BS 5228 (i.e. BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014) for noise and vibration control on construction and open sites, which offers detailed guidance on the control of noise and vibration from demolition and construction activities. For further information, refer to Chapter 9 (Noise and Vibration).

Construction & Demolition Waste Management Plan (C&D WMP)

The demolition waste will be segregated at source where practical and transferred off site for reuse, recycling and recovery, with landfill disposal only to be used where there are no available reuse, recycling or recovery options.

Chapter 14 contains a detailed description of waste management relating to construction of the Proposed Development. A site-specific Construction and Demolition (C&D) Waste Management Plan is included as Appendix 14.1 of this EIA Report. This C&D Waste Management Plan will be implemented to ensure best practice is followed in the management of waste from the Proposed Development.

The majority of construction waste materials generated will be soil from excavation works.

It is expected that volumes of wastes generated (other than excavated material and trees/shrubbery) from other construction activities will be negligible and will generally comprise waste generated from construction workers. These wastes would generally be organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided at the Site compound during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

It should be noted that until final materials and detailed construction methodologies have been confirmed it is difficult to predict with a high level of accuracy the construction waste that will be generated from the construction of the Proposed Development as the exact materials and quantities may be subject to some degree of change and variation during the detailed design and construction process.

2.4.10 Electricity, Potable Water, Surface Water, Foul Wastewater, and Telecommunications during construction

During construction, contractors will require temporary power for onsite accommodation, and construction equipment /plant. The power requirements will be relatively minor. During construction it is anticipated that generators will be provided on site to provide temporary power. Any excavations within the vicinity of existing electrical services will be carried out in consultation with EBS Networks to ensure there is no potential impacts on existing users. Once the construction of the Proposed Development is completed, ESB Networks personnel will be mobilised to complete the commissioning. The electrical connection should have no disruptions to the national grid during connection works

The proposed construction works (inclusive of the Permitted ICT Facility) include the removal, infilling and redirection of the existing agricultural ditches that currently drain the site. Surface water discharge from the site will be managed and controlled for the

duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction. Any discharge water will be treated using a silt-buster or similar to removed suspended solids prior to discharge.

The excavated trench for the underground line will be dewatered if required, from a sump installed within the low section of the opened trench. Where dewatering is required, dirty water will be fully and appropriately attenuated, through silt bags, before being appropriately discharged to vegetation or surface water drainage feature.

Welfare facilities will be provided for the contractors via portable sanitary facilities within the construction compound site during the construction works. Wastewater generated at the welfare facilities in the construction compound will be managed by means of a temporary sealed storage tank, with all wastewater being tankered off-site to an appropriately licensed facility for disposal.

During construction, a temporary connection will be required for welfare facilities, dust suppression and general construction activities. It is anticipated that a combination of tankered water and bottled water will be used. If a temporary connections is required this will be subject to relevant applications and approvals. The water demand during the construction phase will not be significant enough to affect existing pressures.

Telecommunications required during the construction phase will be provided via a mobile connection or temporary connection to the nearby telephone network.

2.4.11 Potential Impacts and Mitigation Measures During Construction

There are potential short-term nuisances such as dust, noise, as well as the potential for pollution of groundwater or the existing drainage ditches associated with demolition, excavations and construction.

In order to manage these short-term impacts the *Outline Construction Environmental Management Plan (CEMP)* prepared by AWN Consulting (Appendix 2.1) will be implemented and adhered to by the construction Contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. The specific mitigation measures to address potential environmental impacts, are presented in each individual EIAR chapter.

The main potential impacts during demolition, excavation, construction, and commissioning which require mitigation are:

- Management of run-off water in terms of silt runoff and dewatering (if required) (see Chapter 5 (Land, Soils, Geology & Hydrogeology) and Chapter 6 (Hydrology) for further information);
- Impacts on human beings in terms of nuisances relating to the air quality of the environs due to dust and other particulate matter generated (see Chapter 8 (Air Quality and Climate) for further information);
- Impacts on human beings in terms of nuisances due to plant noise and vibration from equipment (see Chapter 9 (Noise and Vibration) for further information); and;
- Effects on the road network (due to construction workers and other staff attending site (see Chapter 12 (Traffic and Transportation) for further information).

The potential for impacts depends on the type of construction activity being carried out in conjunction with environmental factors including prevailing weather conditions i.e. levels of rainfall, wind speeds and wind direction; as well as the distance to potentially sensitive receptors.

2.5 COMMISSIONING OF THE PROJECT

Once the construction of the Proposed Development is completed, ESB Networks will mobilise to complete the commissioning. Commissioning will be carried out over a period of weeks and is included within the construction timelines in Table 2.1 above.

Commissioning works primarily involve a suitably qualified individual connecting the relevant cables to a switchgear within the substations. Following this, energisation can take place.

Any final hard landscaping and final soft landscaping will be completed.

2.5.1 Potential Impacts During Commissioning and Mitigation Measures

As there is no requirement for chemicals usage and minimal access to the route by personnel there is no likely environmental effect as a result of commissioning.

2.6 OPERATION OF THE PROJECT

ESB Networks will be the transmission asset owner (TAO) and the distribution asset owner (DAO). EirGrid and ESB Networks will operate the transmission and distribution circuits remotely from their control centres in accordance with their statutory Licences. and ESB Networks will carry out any local operations on Eirgrid's behalf.

2.6.1 110 kV Substation

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

In addition to the weekly inspections, more comprehensive maintenance works will take place annually on each cubicle. This will require up to 4 staff to conduct testing at the substation over a maximum period of 15 days (120 hours).

It is expected that the proposed 4 new transformers (to be located east of and adjacent to the 110 kV GIS substation) will also be inspected during this time.

2.6.2 Underground 110 kV Cable Circuits and Masts

Once constructed, the proposed underground 110 kV circuits will not require any staff to operate them. Instead, ESB Networks maintenance staff will carry out a routine inspection of the asset one year after completion and once every three years thereafter.

2.6.3 Operational Access, Roads and Parking

Access Arrangements

The Cable Circuits and Masts are predominantly on public lands or accessed via existing agricultural entrances on the local road network. Once constructed, the proposed underground 110 kV circuits will not require any staff to operate them. Instead, ESB Networks maintenance staff will carry out a routine inspection of the asset one year after completion and once every three years thereafter.

It is proposed that during operation the 110 kV Substation will be accessed via controlled entry on the permitted inner relief road under WCC Reg. Ref. 201088, from the Kish Business Park road terminus at the western site of the site. This road will be adjacent to Armstrong Engineering and accessed via Clogga Road.

Car and Cycle Parking

Car parking for 9 cars will be provided adjacent to the proposed 110 kV GIS substation. This is to allow for parking for full time staff as well as external staff, maintenance contractors and visitors attending the Proposed Development.

2.6.4 Operational Electricity, Potable Water, Foul Water, and Telecommunications

Electricity

The 110 kV Substation, Cable Circuits, and Mast in themselves do not require an operational electrical supply. The proposed 110 kV substation is designed to support power supply for the Permitted ICT Facility.

Potable Water

The 110 kV Cable Circuits and Mast do not require an operational potable water supply. The proposed 110 kV Substation building has a potable water requirement associated with the toilet, and canteen facilities within the GIS building. The substation building is an unmanned facility with visiting maintenance crews. This is generally a two-man crew visiting the site for 2 days per month.

It is proposed to make a 32 mm connection to the 150 mm watermain, previously approved under Permitted ICT Facility, running in the access road adjacent to the proposed site. This connection will service the canteen and single toilet facility within the substation.

A Pre-Connection Enquiry form has been issued to Irish Water in relation to the feasibility of servicing the Permitted ICT Facility with a water supply connection (CDS21001316). Irish Water issued a Confirmation of Feasibility letter on 4 January 2022 (see Appendix 13.1) to confirm that the proposed water supply connection to the Irish Water network can be facilitated subject to upgrades. The upgrades outlined by Irish Water are for the upsizing of approx. 50 m of existing watermain to 150 mm, and the construction of approx. 50 m of new 150 mm watermain, on site storage will also be required for this development. An agreement will be reached with Irish Water to progress with the connection, and the Applicant will fund a portion of the extension works.

Foul Water

The 110 kV Cable Circuits and Mast do not require an operational foul water supply. The proposed 110 kV Substation building has a foul water requirement associated with the toilet, and canteen facilities within the GIS building. The 110 kV Substation is an unmanned facility with visiting maintenance crews. This is generally a two-man crew visiting the site for 2 days per month.

It is proposed to collect discharged foul water from the proposed 110 kV Substation using a suitably sized network and discharge into a new junior pumping station located in the green area adjacent to the 110 kV Substation. From here sewage will be pumped via a rising main to a new discharge manhole before gravity flowing into the Permitted ICT Facility network.

A Pre-Connection Enquiry form has been issued to Irish Water in relation to the feasibility of servicing the Permitted ICT Facility with a foul water connection (CDS21001316). Irish Water issued a Confirmation of Feasibility letter on 4 January 2022 (see Appendix 13.1) to confirm that the proposed foul water connection to the Arklow WWTP / Irish Water network can be facilitated subject to onsite treatment and upgrade works.

The Permitted ICT Facility includes for on-site treatment of foul water before being pumped via a rising main along the link road and discharge into a receiving discharge manhole located beside the existing Kish Business Park pumping station. Treated effluent then gravity flows into the existing pumping station in Kish Business Park. From that point effluent is pumped southwest along the railway line, under the railway line and then northeast to a gravity network which terminates at the Croghan Industrial Estate Pumping Station.

Surface water

It is proposed to collect runoff from the roofs and all hardstand areas of the 110 kV Substation using road gullies and a suitably sized network and discharge into the Permitted ICT Facility storm sewer which will run in the south western access road. Prior to discharging into this storm sewer in the access road, all run-off will pass through a petrol interceptor. There is no requirement for additional attenuation measures as the Permitted ICT Facility attenuation basin granted has been designed to accommodate all run-off for this Proposed Development.

The Permitted ICT Facility surface water network was designed by previous engineers to comply with the Greater Dublin Strategic Drainage (GDSDS), to service the entire site. Their design intent was to mimic the existing stormwater drainage of the greenfield site, whereby the surface water drained to the existing ditches along the boundary of the site. The Permitted ICT Facility design assumed the greenfield run-off was split equally between the existing culverts under the Dublin-Rosslare railway. The design allowed for the run-off, prior to discharging into the existing culverts, to pass through 2 no hydrobrakes which limited the flow to 101.92 l/s each (203.84 l/s total).

Transformer bases will provide for a leak retention of a minimum of 110% of the stored oil in the transformer. Surface water from each will be pumped from the sump via a pump and monitoring system which will shut down and alarm in the event of oil contamination. Surface water from the normal delivery of the pumps will discharge to the surface water pipes and Class1 interceptor system to prevent contamination

The Cable Circuits and Masts in themselves add no new hardstanding or require surface water management.

2.6.5 Potential Impacts During Operation and Mitigation Measures

The potential impacts of the Proposed Development during operation are very low in magnitude.

110 kV Substation is an unmanned facility with visiting maintenance crews. This is generally a two-man crew visiting the site for 2 days per month. The proposed new cable ducts and masts will produce no outward emissions.

The infrequent maintenance visits will result in very limited impacts from traffic and associated emissions to air and noise associated with that traffic. There will be some wastes generated from onsite activity and maintenance / repairs etc. All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site.

The only regular emission will be from stormwater from roofs and all hardstand areas, noise from the electrical infrastructure at the 110 kV Substation, there is the potential for spills of fuel, oil, or maintenance chemicals to occur on site. There is the potential for visual impacts associated with the proposed 110 kV Substation and masts.

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

ESB Networks has an Environmental Safety and Health Management System (EMS) which will be implemented at the Proposed Development during operations.

2.7 CHANGES TO THE PROJECT

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

If the proposed 110 kV Substation, underground cables and associated ducting are no longer required over the long term, then full decommissioning in accordance with prevailing best practice will be undertaken. All plant and equipment would simply be decommissioned, removed and recycled/disposed as appropriate. The costs associated with the decommissioning, removal and disposal of the asset will be met by the ESB Networks.

The cables to be retired will be identified and spiked (to ensure that decoupling from the switchgear has been successful and the cable is not live). The cable will then be cut and capped to protect the exposed cable. The excavated pit can be reinstated using the excavated material, with no import of fill required. The retired cable can remain in situ in the ground, with the potential for it to be returned to operation should it be required in the future.

2.8 DESCRIPTION OF OTHER RELATED PROJECTS

2.8.1 Permitted ICT Facility WCC Reg. Ref. 20/1088

The proposed 110 kV Substation will serve the Permitted ICT Facility under WCC Reg. Ref.: 20/1088. The Permitted ICT Facility will consist of the following:

- Demolition of existing outbuildings on the subject site, along with all site clearance and enabling works;
- Construction of 3 no. part one storey, part two storey information and communication technology (ICT) facility buildings, each with a gross floor area (GFA) of c. 22,210 sq.m (66,630 sq.m in total), and with a height (to parapet level) of c. 10.4 metres;
- Each of the 3 no. ICT facility buildings will accommodate ICT equipment rooms, associated electrical and mechanical equipment rooms, loading bays, maintenance and storage space, office administration areas, and staff facilities.
- Emergency generators (20 no. for each ICT facility building), flue stacks and associated plant are provided in a fenced compounds adjacent to each ICT facility;
- Extension of the existing road serving Kish Business Park to serve the subject site, with gated access points to the proposed ICT facility development to be provided off this roadway on its eastern side. The proposed roadway will form part of the inner relief road planned under Objective IT7 of the Arklow Town and Environs LAP 2018-2024;
- Construction of internal road network and circulation areas, footpaths, provision of 180 no. car parking spaces (60 no. spaces to serve each ICT facility) and 18 no. cycle parking spaces;
- Landscaping and planting, boundary treatments, lighting, security fencing, gatehouse (with a GFA of 175 sq.m), and all associated site works including underground foul and storm water drainage network, attenuation areas, and utility cables, on an application site area measuring c. 24.16 hectares.

The Permitted ICT Facility is anticipated to be constructed on a phased basis over 6 years. The anticipated phased development is set indicatively in Table 2.4 below.

Table 2.4 *Proposed Construction Phasing of the Permitted ICT Facility*

Phase	Building Name	Estimated Start	Estimated End	Construction Duration (months)
Phase 1	Building 1	Q2 2023	Q2 2025	24
Phase 2	Building 2	Q1 2025	Q4 2026	24
Phase 3	Building 3	Q4 2026	Q3 2028	24

Based on the applicant's current timelines, it is likely that the construction of the Proposed Development will directly coincide with the construction and commissioning works for the Permitted ICT Facility. However, it is submitted that these timelines may be subject to change outside the applicant's control.

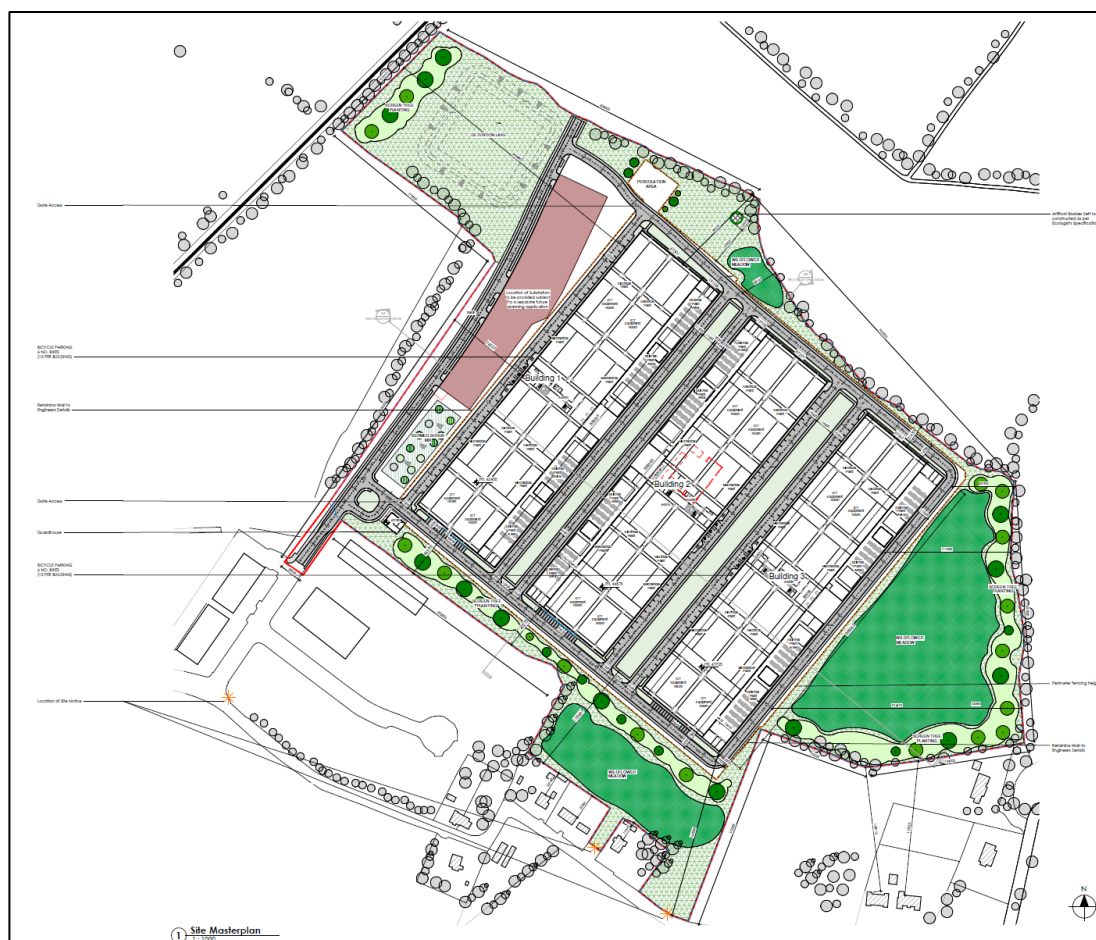


Figure 2.11 Site Layout for the Permitted Development

2.8.1.1 Potential Impacts from Other Related Projects and Mitigation Measures

As part of the assessment of the impact of the Proposed Development, account has also been taken of developments that are currently permitted or under construction within the neighbouring industrial parks and surrounding areas. The potential for Cumulative Impacts has been addressed in each Chapter of this EIA Report.

There are potential short-term nuisances such as dust, noise, as well as the potential for pollution of groundwater or the existing drainage ditches associated with the demolition, excavations and construction of the Permitted ICT Facility. In advance of work starting on site, the works contractor will further detail the outline Construction Environmental Management Plan (CEMP) to include the planning conditions under WCC Reg. Ref. 201088. The CEMP required under Condition 8 of WCC Reg. Ref. 201088 will set out the mitigation measures contained within the EIA and the overarching vision of how the construction of the Permitted ICT Facility will be managed in a safe and organised manner by the Contractor.

2.9 PERMITTED DEVELOPMENT AND PROPOSED DEVELOPMENT WITHIN THE SURROUNDING AREA

As part of the assessment of the impact of the Proposed Development, account has been taken of relevant developments that are currently permitted, or under construction and substantial projects for which planning has been submitted within the surrounding areas.

The search also showed a significant number of small extensions, retention and other minor alterations. These permissions were for established business within the vicinity of the development and have been considered as a part of the overall project impact.

The planning search tool was used to generate a list of relevant planning permissions from the surrounding areas of the Proposed Development within the previous five years. The outcome of this search is presented in Table 2.6 below.

The most relevant Proposed Development that may be capable of combining with the Proposed Development and resulting in cumulative effect during either the construction or operational phase is the proposed Biofuel Facility proposed under Reference: 21677 (under appeal ABP reg.: PL27.312181).

The proposed Biofuel Facility is anticipated to be constructed over 1 year. The total peak construction population on site is estimated to be up to 15 staff. A preliminary Construction Environmental Management Plan (CEMP) has been prepared for the proposed Biofuel Facility and the construction contractor shall develop the detailed Construction & Environmental Management Plan prior to commencement of development. The CEMP will incorporate mitigation measures outlined in the proposed Biofuel Facilities EIA report as they relate to the construction phase.

Table 2.5 WCC Planning History relevant within the vicinity of the subject site.

Planning Reference, Applicant, and Location	Development Description	Decision & Decision Date
Applicant: Kish Renewables Limited Reference: PL27.312181 Location: Kish Business Park, Clogga Road, Arklow, Co. Wicklow	Construction of Biofuel facility comprising of a part 3 storey and part single storey commercial building with a total floor area of 1771m ² , covered truck filling / unloading area. Pipe bridge and tank farm storage area. The overall building height is 14 metres with solar panels on the roof. The maximum height of any storage tank is 12 metres and the boiler room chimney is 15 metres. Extension of the existing Kish Business Park access road, footpaths, drainage and water supply to serve the subject site. New internal roads, footpaths, 21 no. car parking spaces, 10 no. cycle parking spaces and parking and circulation areas for 10 no. trucks; 2 no. vehicular entrances, pedestrian access, boundary treatment and landscaping, ESB substation and new underground foul and storm water drainage system for the site including rainwater harvesting, attenuation pond, full retention oil interceptor and associated works. The application site area is 1.6 hectares. An Environment Impact Assessment Report (EIAR) has been prepared and will be submitted to the Planning Authority with the planning application.	Decision: Appeal Decision Due Date: 26/04/2022
Applicant: John Pettitt Wexford UC Reference: 22747 Location: Pettits Supervalu, Wexford Rd, Knockanrahan Lower, Arklow	159.25 kilowatts (350no.) of roof mounted Photo Voltaic Solar Panels (788m ²) placed on the roof of our Arklow store, and all associated works.	Decision: Grant Permission (with Conditions) Date: 22/08/2022
Applicant: Armstrong Timber Engineering Ltd Reference: 22243 Location: Kish Business Park, Clogga Road, Arklow, Co. Wicklow	(i) Single storey industrial unit (Gross Area 2,380sqm) in lieu of that allowed under PPR21/951 and (ii) new car park and timber storage compound and all associated site works	Decision: Grant Permission (with Conditions) Date: 08/06/2022
Applicant: Votumann Ltd	(a) Retention permission for the demolition of the pre-existing dwelling on site. (b) Permission for 21 dwellings of 2 and 3	Decision: Grant

Reference: 21710 Location: Emoclew Road, Arklow, Co. Wicklow	storey terrace units with ancillary site development and services. (c) Permission for opening a new vehicular entrance along the front boundary and all associated works.	Permission (with Conditions) Date: 05/04/2022
Applicant: Armstrong Timber Engineering Ltd Reference: 21951 Location: Kish Business Park, Clogga Road, Arklow, Co. Wicklow	(i) Single storey industrial unit (Gross area 3150 Sqm) infill extension between existing buildings. (ii) New car park and timber storage compound (0.7 Ha) and all associated site works	Decision: Grant Permission (with Conditions) Date: 01/03/2022
Applicant: Charles McCreery Reference: 21713 Location: Clogga, Arklow, Co. Wicklow Y14 FW90	Demolition of existing single storey commercial building which comprises of the former 12 no bedroom, Clogga Bay hotel, demolition of existing 3 no bedroom dwelling adjoining the hotel, removal and backfill of the existing swimming pool, construction of 1 no single storey, detached replacement dwelling comprising 6 no bedrooms. The proposed dwelling will also include a revised vehicular driveway with car parking area accessed via existing vehicular entrance off Clogga Cove, private amenity space including soft landscaping and boundary treatments, provision of a new wastewater treatment system, suDS, and well and all ancillary works necessary to facilitate the development	Decision: Grant Permission (with Conditions) Date: 11/02/2022
Applicant: Cordiva Limited Reference: 211218 Location: Heatherside, Vale Road, Yardland Td, Arklow, Co. Wicklow	Extend the appropriate period of 08/610066 - residential development comprising a creche; 185 houses with 4 house types; 8 duplex units over 8 apartments; new access/relief road and infrastructure linking Vale Road to Lamberton Avenue; all services and ancillary site development works; relocation of part of existing overhead ESB lines; with temporary effluent treatment plant and sewerage pumping station at Yardland Td.	Decision: Grant Extension Permission Date: 13/01/2022
Applicant: Pascal Birmingham Reference: 211157 Location: Heatherside, Yardland Td, The Vale Road, Arklow Co Wicklow	Replacement of 1 no. detached house (House Type B) & 2 no. semi detached houses (House Type A) at site no's 20,21 & 22 The Drive to 3 no. detached houses (Type PBd) together with all associated site works within an existing estate (Heatherside being constructed at present) pursuant to Plan Reg. Ref 08/610066, 13/610035, 19/373.	Decision: Grant Permission (with Conditions) Date: 12/01/2022
Applicant: Aoife Somers & Henry Kinch Reference: 21257 Location: Ballygriffin, Arklow, Co. Wicklow	Detached bungalow with detached garage together with waste water treatment system to current EPA standards, on site bored well, new vehicular entrance onto main road and ancillary works	Decision: Grant Permission (with Conditions) Date: 11/06/2021
Applicant: Trevor Nuzum Reference: 20731 Location: Ballintombay, Arklow, Co. Wicklow	(i) machinery shed (492sqm) (ii) lean to extension (283sqm.) to existing building permitted under PRR 98/9110 and (iii) portacabin building for use as site office, all structures in connection with the applicants agricultural contracting business	Decision: Grant Permission (with Conditions) Date: 11/06/2021
Applicant: Crag Wicklow Limited Reference: 201088 Location: North & Northeast of Kish Business Park, Arklow, Co. Wicklow	Proposed Development, for which a ten-year permission is sought, consists of the following: Demolition of existing outbuildings on the subject site, along with all site clearance and enabling works; Construction of 3 no. part one storey, part two storey, information and communication technology (ICT) facility buildings, each with a gross floor area (GFA) of C. 22,210 sq. m (66,630 sq. m GAF in total), and with a height (to parapet level) of c. 10.4 metres; Each of the 3 no. ICT facility buildings will accommodate ICT equipment rooms, associated electrical and	Decision: Grant Permission (with Conditions) Date: 10/06/2021

	<p>mechanical equipment rooms, loading bays, maintenance and storage space, office administration areas, and staff facilities; Emergency generators (20 no. for each ICT facility building), flue stacks and associated plant are provided in fenced compounds adjacent to each ICT facility; Extension of the existing road serving Kish Business Park to access the subject site, with gated access points to the proposed ICT facility development to be provided off this roadway on its eastern side. The proposed roadway will form part of the inner relief road planned under Objective IT7 of the Arklow Town and Environs LAP 2018-2024; Construction of internal road network and circulation areas, footpaths, provision of 180 no. car parking spaces (60 no. spaces to serve each ICT facility) and 18 no. cycle parking spaces; Landscaping and planting, boundary treatments, lighting, security fencing, gatehouse (with a GFA of 175 sq. m), and all associated site works including underground foul and storm water drainage network, attenuation and percolation areas, and utility cables, on an application site area measuring c. 24.16 hectares. Site located to the North & Northeast of the existing Kish Business Park</p>	
<p>Applicant: Cordiva Limited Reference: 20235 Location: Heatherside, Yardland Td., The Vale Road, Arklow, Co. Wicklow</p>	<p>Revisions to development permitted under Reg Ref 08/610066 (as extended by Reg Refs 13/610035 and 19/373 and revised by Reg Refs 16/1418, 18/1033 and 19/266 and concurrent revisions applications Reg Ref 20/187 and shall provide for the replacement of 55 no previously permitted units located in 'Phase 3' (comprising 6 no type B, 16 no type C, 17 no type D and 16 no type X 3 bedroom semi detached / terraced two storey house units), with 84 no residential units (comprising 68 no 2 storey houses and 16 no apartment / duplex units arranged across 3 storeys). Permission is also being sought for the omission of 22 no previously permitted units comprising 6 no houses (consisting of 2 no 3 bedroom semi detached two storey type C house units and 4 no 3 bedroom terraced 2 storey type D house units) and 16 no apartments (consisting of 8 no 2 bedroom single storey / ground floor apartment unit and 8 no 3 bedroom 2 storey / duplex apartment units) located to the north of the site and in their place the provision of an enlarged area of public open space</p>	<p>Decision: Grant Permission (with Conditions) Date: 18/03/2021</p>
<p>Applicant: Cordiva Limited Reference: 201228 Location: Heatherside, Yardland Td., The Vale Road, Arklow, Co. Wicklow</p>	<p>Replacement of 2 no. semi detached houses (House Type C) at sites 1a & 2a The Drive to 2 no semi-detached houses (House Type ABs) and for the replacement of 4 no. terrace houses (House Type E) at sites 8, 9, 10 & 11 The Green to 4 no. terrace houses (House Type D1t), together with all associated site works within an existing estate (Heatherside being constructed at present) pursuant to Plan Reg. Ref 08/610066, 13/610035 & 19/373</p>	<p>Decision: Grant Permission (with Conditions) Date: 14/03/2021</p>
<p>Applicant: S. U. Autoparts Ltd Reference: 201060 Location: Unit C Croghan Industrial Estate, Emoclew Road, Arklow, Co. Wicklow</p>	<p>Section of building extended to make building square on north corner and elevation changes, and permission for a change of use to light industrial storage and the appropriate treatment and recycling or reclamation of metals and metal compounds from end of life vehicles, new front boundary security fencing, storage racking for up to 10 end of life vehicles awaiting depollution. The Proposed Development will be subject to a Waste Facility Permit and all associated works</p>	<p>Decision: Grant Permission (with Conditions) Date: 23/02/2021</p>
<p>Applicant: Cordiva Limited Reference: 20187 Location: Heatherside, Yardland Td., The Vale Road, Arklow, Co. Wicklow</p>	<p>Revisions to development permitted under Reg Ref 08/610066 (as extended by Reg Refs 13/610035 and 19/373 and revised by Reg Refs 16/1418, 18/1033 and 19/266) and shall provide for (1) the omission of 3 no residential units (comprising 2 no 4 bedroom semi detached two storey Type A house units and 1 no 4 bedroom detached 2 storey type A house unit) and the provision of 5 no new residential units (2 no type C2 units and 3 no type C2 units) at an alternative location within the site and (2) omission of a permitted community / crèche facility and delivery of a new crèche facility of c 353.9 sqm GFA at an alternative</p>	<p>Decision: Grant Permission (with Conditions) Date: 22/01/2021</p>

	location within the site. The new residential units shall comprise 5 no 3 bedroom house units (2 storeys in height) in the form of 2 no type C1 end of terrace units (c 96.8 sqm each) and 3 no type C2 mid terrace units (c96.8 sqm each) and associated private open space to the rear of each unit. The new crèche facility shall comprise a single storey building of c353.9 sqm GFA, associated outdoor play space of c 344.8 sqm, 2 no baby rooms, 2 no activity rooms, 1 no sleep room, entry foyer / shared central space, accessible WC, admin office, sluice / laundry area, staff tea station / kitchen, and dining area / family room / multipurpose space. The proposal shall also provide for 18 no car parking spaces (10 no car parking spaces to serve the 5 no residential units and 8 no car parking spaces to serve the new crèche facility), all associated landscaping works including boundary treatment, bin storage facilities, and all associated residential access roads and site development works. All other development within the site shall remain as permitted under Reg Ref 08/610066 (as amended and extended)	
Applicant: Paul Duignan Reference: 201032 Location: Kish, Clogga Road, Arklow, Co. Wicklow	Installation of a new effluent treatment system and percolation area in full accordance with EPA Cop 2009 standards and all associated site works, together with a new bored well.	Decision: Grant Permission (with Conditions) Date: 19/01/2021
Applicant: Vodafone Ireland Ltd Reference: 20822 Location: Eir, Croghan Industrial Estate, Emoclew Road, Arklow, Co. Wicklow	Extension of an existing telecommunications lattice tower (providing the new overall height of 37.5m), carrying existing antennas, dishes and associated equipment and additional antennas, dishes and associated equipment, together with new ground equipment cabinets, new fencing and all associated site development works	Decision: Grant Permission (with Conditions) Date: 17/11/2020
Applicant: Patrick Gregan & Richard Conroy Reference: 191171 Location: Lamberton, Coolgreaney Road, Arklow, Co. Wicklow	Housing estate on a 1.6744HA site, on the north side of Coolgreaney Road, Arklow, comprising of 33 units in total: (A) the construction of six no. 4 bedroom, semi detached 2 storey houses, 26 no. 3 bedroom semi-detached 2 storey houses and one no. 4 bedroom, detached 2 storey house; (B) the construction of a new access road and footpaths (cul-de-sac) and pedestrian access off coolgreaney road and all associated boundary treatment works; (C) provision of a 5,897sqm open space comprising of 4,097sqm of usable public open space suitable for recreational use; (D) all associated ancillary site development works	Decision: Grant Permission (with Conditions) Date: 19/10/2020
Applicant: LMH Engineering Reference: 20632 Location: IDA Business Park, Ballynattin, Arklow, Co. Wicklow	Erect a 2,300m ² manufacturing & engineering industrial unit with connecting 440m ² office building along with all associated site development works including storage yard, car parking, signage and connect to the existing services	Decision: Grant Permission (with Conditions) Date: 12/10/2020
Applicant: Robert Marshall Reference: 191322 Location: Kish Business Park, Clogga Road, Arklow, Co. Wicklow	Single storey 710 sqm industrial unit, comprising of a 236 sqm metal fabrication workshop, and 474 sqm trade sales and display area, plus 272 sqm concrete surfaced yard with security fence to the side of the proposed building, connect into the existing mains sewer and storm water systems, to provide car parking, a 3.5m high sign at the site entrance and all additional site works	Decision: Grant Permission (with Conditions) Date: 18/03/2020
Applicant: Cordiva Ltd Reference: 181033 Location: Heatherside, Vale Road, Yardland	Change of house type for sites numbers 3, 4, 7 and 8 The Drive from house type E (semi detached) to house type D1s (semi detached) and for site number 9 The Drive from 1 no house type C (detached) to 1 no house type C1s (semi detached) and for 1 no additional house type C1s (semi detached) on site number	Decision: Grant Permission

Td., Arklow, Co. Wicklow	10 The Drive and for change of house type for sites 11 to 16 The Park from 4 no house type A (detached) and 2 no house type A (semi detached) to 4 no house type D1t (Terraced) and 2 no house type C1s (semi detached) and permission for 2 no additional house type B1s (semi detached) on sites numbers 17 and 18 The Park and for the omittance of 2 no house type A (semi detached) at sites numbers 16 and 17 The Drive and 1 no house type A (detached) at site number 18 The rive and associated site works within an existing estate (Heatherside being constructed at present) pursuant to Plan Reg Ref 05/610066 and 13/610035	(with Conditions) Date: 13/12/2019
Applicant: Irish Water Reference: PA27.302556 Location: Arklow, Tinahask Lower and Ferrybank, Co. Wicklow.	The Proposed Development will comprise a new Wastewater Treatment Plant (36,000PE), Interceptor Sewers and associated Storm Water Overflows and Stormwater Storage Tank, Sea Outfall Pipelines and Upgrade to a Section of the existing Coastal Revetment.	Decision: Grant Permission (with Conditions) Date: 01/08/2019
Applicant: Ardale Property Ltd Reference: 18711 Location: Yardland Td, Vale Road, Arklow, Co. Wicklow	Extend the appropriate period of a permission - 08/66 - residential development comprising a creche; 185 houses with 4 house types; 8 duplex units over 8 apartments; new access/relief road and infrastructure linking Vale Road to Lamberton Avenue; all services and ancillary site development works; relocation of part of existing overhead ESB lines; with temporary effluent treatment plant and sewerage pumping station at Yardland Td	Decision: Grant Extension Permission Date: 23/05/2019
Applicant: Kish Business Park Ltd Reference: 18711 Location: Kish Business Park, Clogga Road, Arklow, Co. Wicklow	Single storey industrial unit (Gross Area 1513sqm) comprising 6 individual units for light industrial and warehousing use, 35no carparking spaces, truck unloading bay, connection to existing services and all associated site works	Decision: Grant Extension Permission Date: 09/04/2019
Applicant: Armstrong Timber Engineering Ltd Reference: 181283 Location: Unit 1 Kish Business Park, Clogga Road, Arklow, Co. Wicklow	56 sqm of existing first floor office and external window and full permission for office (gross area 120 sqm) and windows at second floor, new fire escape at ground floor, additional parking and all associated site works	Decision: Grant Permission (with Conditions) Date: 27/02/2019
Applicant: Wicklow County Council Reference: 171234 Location: Lands known as Meadowvale (now named Delany Park), Wexford Road, Arklow, Co. Wicklow	Development will consist of 47 residential units comprising (a) 20 no. 1 bed units, (b) 21 no. 2 bed units, (c) 4 no. 3 bed units and (d) 2 no. 4 bed units	Decision: Grant Permission Date: 08/03/2018
Applicant: Restwing Trading Ltd Reference: 171337 Location: Yellow Lane, Knockenrahan Lower, Arklow, Co. Wicklow	Change of use from industrial warehouse to plastic waste recycling facility and associated works	Decision: Grant Permission (with Conditions) Date: 09/02/2018
Applicant: Thomas Hyland Reference: 171068 Location: Wexford Road, Arklow, Co. Wicklow	Green open space to vehicle storage compound and shall include the following (a) change of use of open green space to vehicle storage compound (b) formation of gravel surface (c) construction of boundary wall including metal railing (d) formation of an additional vehicle entrance (e) associated site works	Decision: Grant Permission (with Conditions)

		Date: 28/11/2017
Applicant: Armstrong Timber Engineering Ltd Reference: 17941 Location: Unit 1 Kish Business Park, Clogga Road, Arklow, Co. Wicklow	Single storey industrial unit (gross area 1523 sqm) for timber storage, revised parking layout and all associated site works and RETENTION of revised layout to eastern gable doors to existing building and boundary fence treatment	Decision: Grant Permission (with Conditions) Date: 22/11/2017

3.0 ALTERNATIVES

3.1 INTRODUCTION

The requirement to consider alternatives within an EIAR is set out in Annex IV (2) of the EIA Directive (2014/52/EU) and in Schedule 6 of the Planning and Development Regulations, 2001, as amended (“the Regulation”), which state:

*A description of the **reasonable alternatives [emphasis added]** 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.*

Schedule 6(2)(b) of the Regulations implement this requirement by requiring the following information:

(b) a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) 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 selecting the chosen option, including a comparison of the environmental effects;

Reasonable alternatives may include project design proposals, location, size and scale, which are relevant to the Proposed Development and its specific characteristics. The regulations require that an indication of the main reasons for selecting the preferred option, including a comparison of the environmental effects to be presented in the EIAR.

The *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018)* – states:

The Directive requires that information provided by the developer in an EIAR shall 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. The developer must also indicate the main reasons for the option chosen taking into account the effects of the project on the environment.

Reasonable alternatives may relate to matters such as project design, technology, location, size and scale. The type of alternatives will depend on the nature of the project proposed and the characteristics of the receiving environment. For example, some projects may be site specific so the consideration of alternative sites may not be relevant. It is generally sufficient for the developer to provide a broad description of each main alternative studied and the key environmental issues associated with each. A ‘mini- EIA’ is not required for each alternative studied.

As such, the consideration and presentation of the reasonable alternatives studied by the project design team is an important requirement of the EIA process.

This section provides an outline of the reasonable alternatives examined during the design phase. It sets out the main reasons for choosing the development as proposed, taking into account and providing a comparison on the environmental effects.

This section assesses the evolution of development and the alternatives examined by the Applicant relating to the location, size and scale and project design and technology of the Proposed Development. This section provides a full justification for the Proposed Development and provides a comparison of the environmental effects of each alternative option.

The reasonable alternatives examined throughout the design process are set out as follows:

- Do nothing alternative;
- Alternative project locations;
- Alternative layout, size and scale;
- Alternative processes; and
- Alternative mitigation measures.

This chapter describes the alternatives that were considered for the Proposed Development, where applicable, under each of these headings and the reasons for the selection of the chosen options, including a comparison of environmental effects.

3.2 DO NOTHING ALTERNATIVE

The Proposed Development site is currently an undeveloped greenfield site used for agricultural purposes. The proposal subject of this planning application forms part of a wider development site for the development consisting of three ICT facility and ancillary structures (WCC Reg. Ref.: 201088) as described in Chapter 2, Section 2.8). The proposed 110 kV Substation and underground grid connection will serve the permitted ICT Facility.

Developing the permitted ICT Facility at this location would also derive the benefits and maximise upon existing infrastructure, which is supported by the county development plan and maximise upon the development potential of the site.

The do-nothing scenario would result in both the Proposed Development and the permitted ICT Facility not proceeding at this time. Given the zoning of this land, it is likely that development on these lands would proceed at some point in the future.

3.3 ALTERNATIVE PROJECT LOCATIONS

3.3.1 110 kV Substation

The applicant is not a Local Authority or a State Body (as set out under Part XI of the Planning and Development Act as amended). The applicant is a private entity and requires electricity connections to power the Permitted ICT Facility on the adjoining lands at Kish Business Park.

The Proposed Development is designed to support the power demand of development on lands adjoining the proposed 110 kV substation.

On the 10th of June 2021, a final grant of permission was issued by the Wicklow County Council for Permitted ICT Facility on the adjacent lands under Reg. Ref.: 20/1088. The Permitted ICT Facility included the site of the 110 kV Substation now proposed.

The proposed location is deemed to be the most logical location on the site for such a development and to provide the energy needed for the area. It was not deemed practicable or necessary therefore, to consider an alternative location for the proposed 110 kV Substation during this assessment.

3.3.2 110kV Transmission Line Route

The assessment of the alternative routes for the 110kV transmission line considered four route options for the 110kV transmission line as follows:

- Route Option 1 – Via the town of Arklow to Arklow Substation
- Route Option 2 – Via the town of Arklow to the permitted Pollahoney substation
- Route Option 3 – Loop in / loop out to existing Arklow – Banoge overhead line
- Route Option 4 – Via Emoclew road to Arklow substation

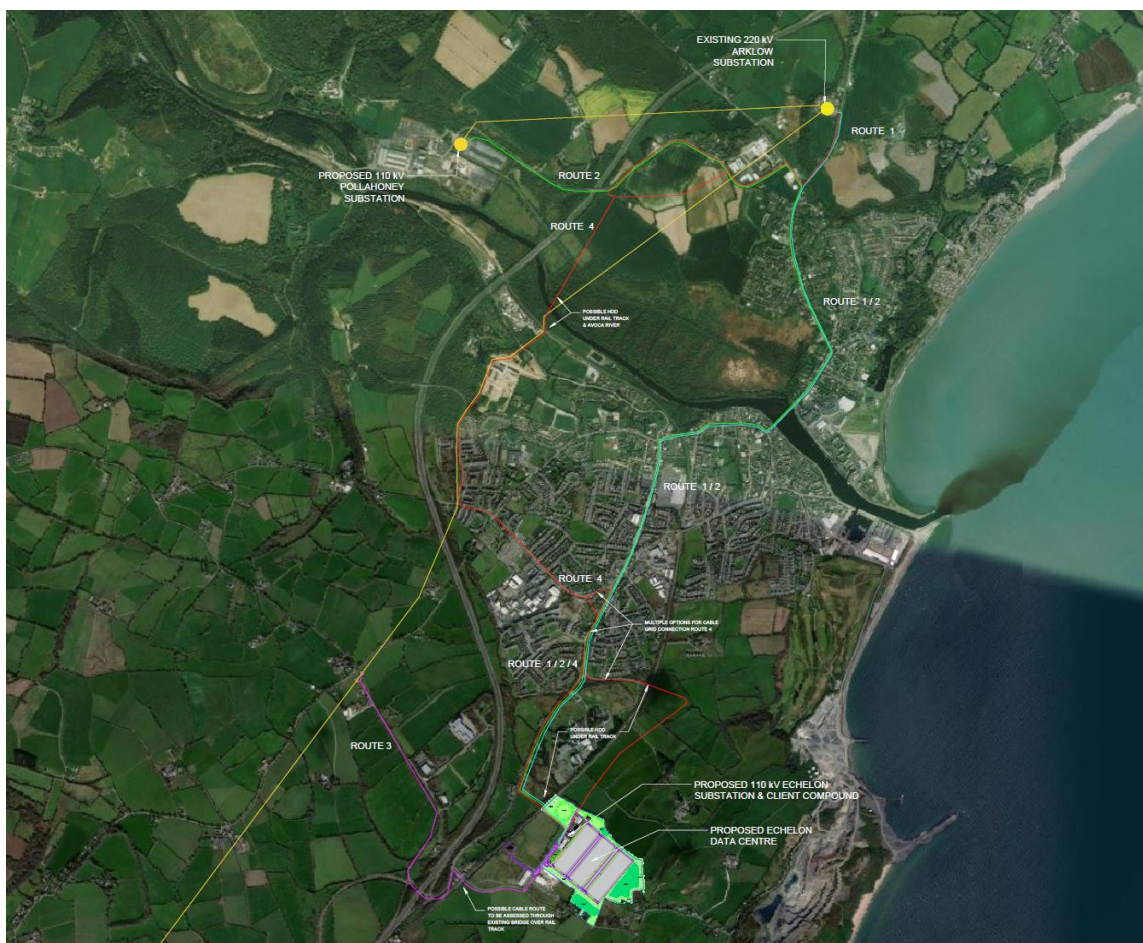


Figure 3.1 Proposed 110 kV Grid Route Options

3.3.2.1 Route Option 1 – via the town of Arklow to Arklow substation

Route Option 1 passes below the rail line to the west of the proposed 110 kV Substation site via horizontal directional drilling (HDD), passes through private lands to the northwest, and then follows public roads northwards through the town of Arklow, crossing the Avoca River at the 19 Arches Bridge, and proceeds north along public roads to the existing Arklow 220 kV substation.

3.3.2.2 Route Option 2 – via the town of Arklow to Pollahoney substation

Route Option 2 broadly follows the same path as Route Option 1, before branching off westward to the south of the Arklow substation, proceeding beneath the M11 before reaching the permitted Pollahoney 110 kV substation (which was permitted under a previous section 182A application under ABP Ref.: 309252-21).

3.3.2.3 Route Option 3 – Loop in / loop out to existing Arklow – Banoge overhead line (Chosen Route)

Route Option 3 proceeds from the proposed 110 kV Substation site to the southwest, crossing the nearby railway line via an existing bridge, and crossing the M11 before proceeding northwest along public roads to a loop in / loop out of the existing Arklow – Banoge 110 kV overhead line. This option would require the construction of two drop-down transmission line masts in order to loop in and out of the existing overhead line.

3.3.2.4 Route Option 4 – via Emoclew road to Arklow substation

Route Option 4 provides several sub-options, following a similar route to Routes 1 and 2 (with some possible deviations), before diverging at Emoclew Road and proceeding northwest via public roads and private lands, before crossing beneath the Avoca River via HDD, and proceeding northeast via Arklow Town Marsh proposed Natural Heritage area, and private lands and public roads and reaching the existing Arklow 220 kV substation.

3.3.2.5 Consideration of Route Options

A preliminary appraisal and comparison of the environmental effects of the potential route options was undertaken as part of the route selection process to determine the more preferred and less preferred option, and in some cases there was no discernible difference between the route options and are therefore considered neutral.

This preliminary appraisal of the potential environmental effects Construction Phase for each environmental factor is listed in Table 3.1 below. For the construction phase, the duration of impacts for both route options would be **short term** in duration as the works for the underground cable works would have a duration of less than 1 year.

Table 3.1 Summary of route preference for each environmental factor

Environmental Factor	Route Option 1	Route Option 2	Route Option 3	Route Option 4
Human Health and Populations				
Land, Soil Geology and Hydrogeology				
Hydrology				
Biodiversity				
Air Quality				

Noise and Vibration				
Landscape and Visual Impact Assessment				
Archaeology and Cultural Heritage				
Material Assets, including traffic and Waste				

Less Preferred (greater potential environmental impact)	Neutral (neutral potential environmental impact)	More Preferred (lessor potential environmental impact)

There is the potential for significant effects on biodiversity associated with Route Options 4 as this crosses the Arklow Town Marsh Proposed Natural Heritage Area. Furthermore, Route Options 1, 2, 4 have greater potential for significant effects on biodiversity and hydrology with the HDD crossing under the Avoca River. The Route Options 1, 2, 4 also come into contact with a greater number of sensitive residential receptors and road users therefore resulting in a greater potential for noise, air quality (dust) and human health and population effects.

Route Option 3 includes the installation of new masts that will result in greater visual effects. The review of relevant environmental factors shows a preference for Option 3 based on short term impacts during construction. This is primarily due to the fact that Option 3 is a significant shorter route and avoids crossing any significant watercourses or area of ecological importance and comes into proximity to a lessor number of sensitive residential receptors and road users being impacted.

It is noted that the above preferences in Table 3.1 are based on potential Construction Phase impacts only. In terms of the Operational Phase for either of the route options, each of the environmental factors were considered to have a **long-term, neutral** and **imperceptible** impact on the environment.

Through the design process Route Option 3 (the chosen route) was refined into the Proposed Development shown in Figure 3.1.

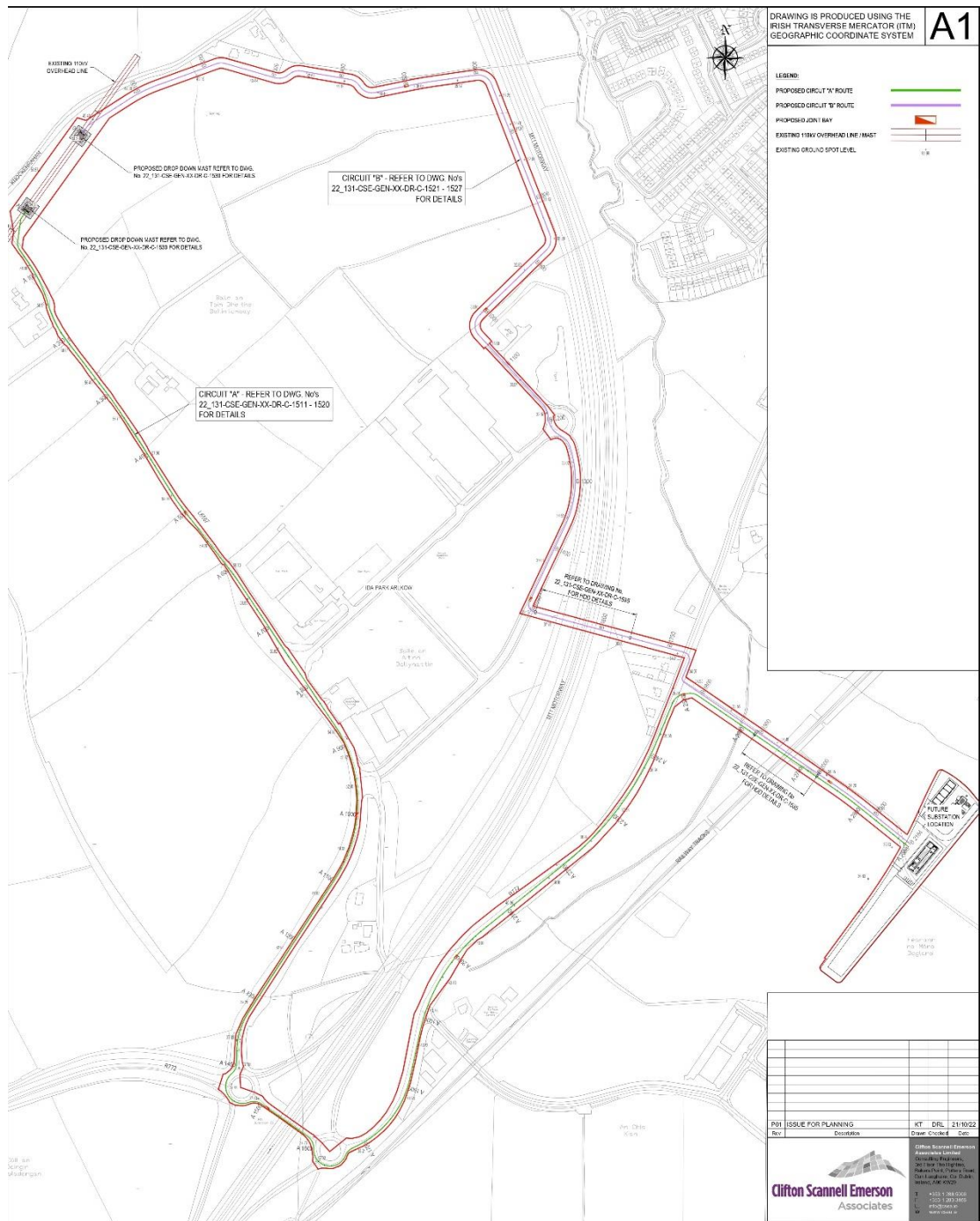


Figure 3.2 110 kV Route option 3 (Chosen Route)

3.4 ALTERNATIVE DESIGN/LAYOUTS

The proposed 110 kV Substation and underground cable design based on requirements stipulated by the ESB Networks and EirGrid. The design of the substation units is centred around the equipment requirements of ESB Networks that are required to provide an efficient and safe service. Therefore, from an alternative 'design' point of view, the flexibility to select alternatives 110 kV Substation and underground cable is not available to the Applicant. The proposed 110 kV Substation and underground grid connection will serve the permitted ICT Facility permitted under

WCC Reg. Ref.: 201088. This permitted development reserved adequate space for the Proposed Development.

Whilst there are no alternatives for design, there is the floatability to alter the layouts of the Proposed 110 kV Substation. The assessment of the alternative layouts for the 110 kV Substation considered three design options as follows:

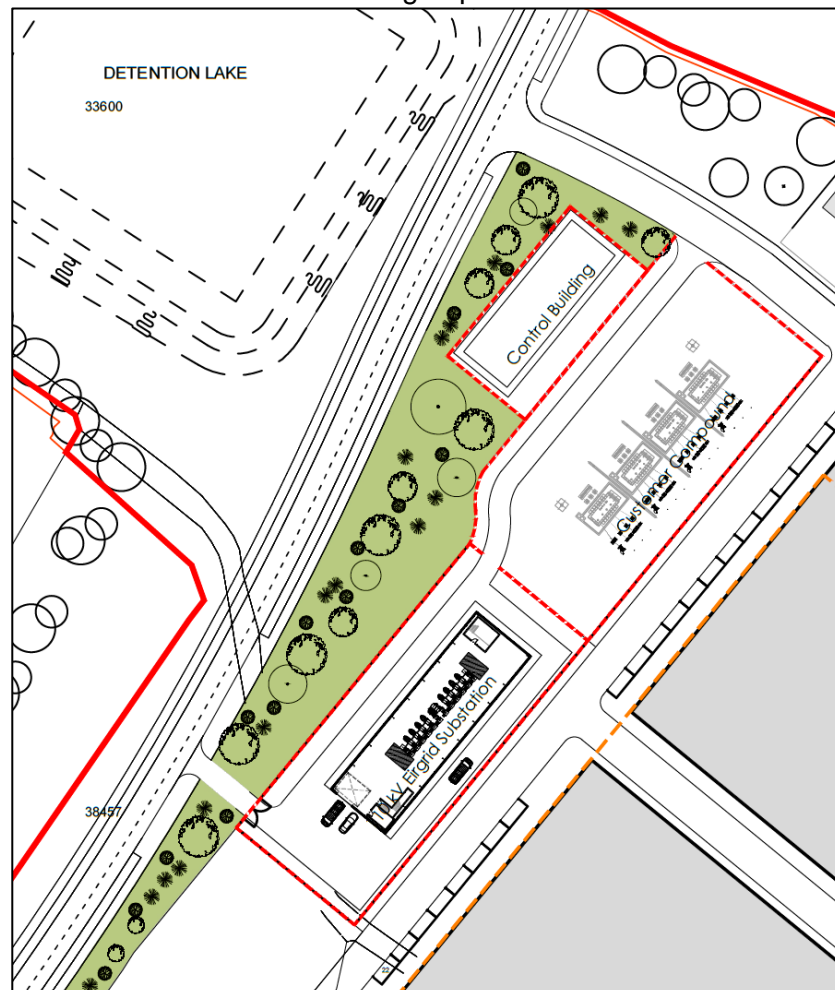


Figure 3.3 110 kV Substation Layout Option 1

Option 1, which is detailed in Figure 3.3 above, shows a layout of similar design to the chosen layout. It has one access road which is centred between the control building and the customer compound which continues to the substation. It provides adequate parking, ample landscaping for screening of the development at the link road and requires little alterations to the current environment. This option, however, was viewed negatively from an ESB standard design perspective as it did not allow for separate access or appropriate circulations space as per ESB minimum requirements, it only allows for one access road to both the substation and the customer compound.

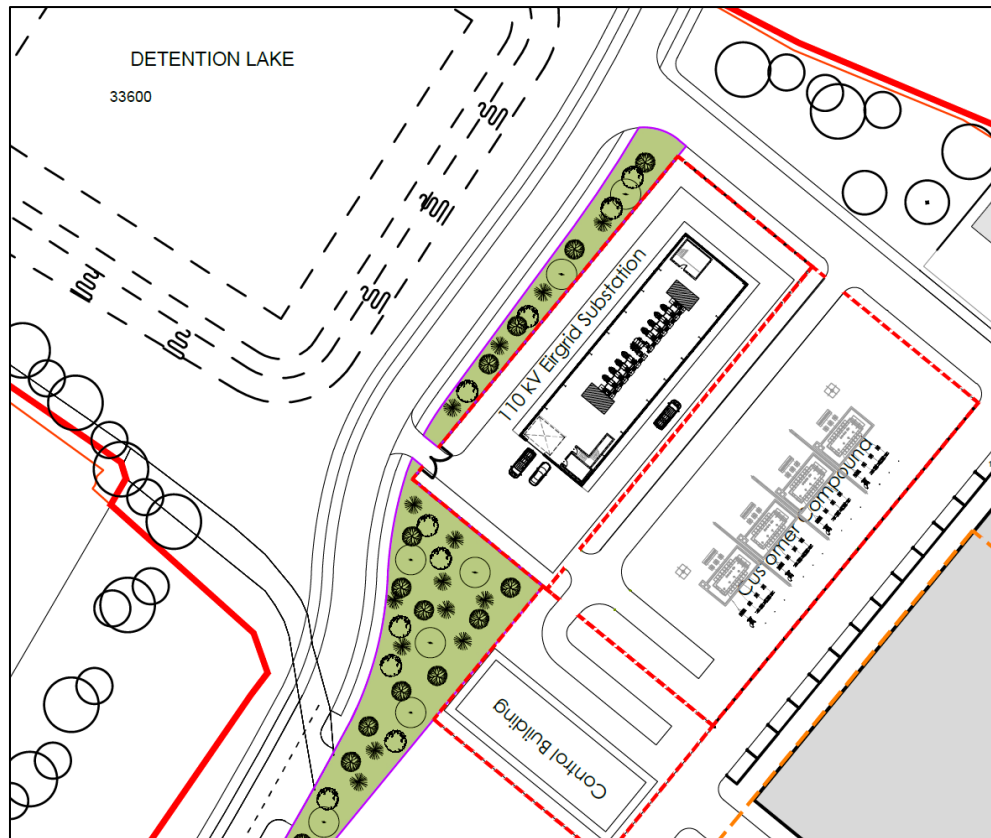


Figure 3.4 110 kV Substation Layout Option 2

The second option, as depicted in Figure 3.4 above, allows for the substation and customer compound to be located near the entrance to the site and allow easy access to both. This option, however, involves extensive construction works to move the link road and the detention lake to provide capacity for the aligning facilities. There is also a negative landscape and visual impact with this option as it does not provide adequate screening between the development and the link road.

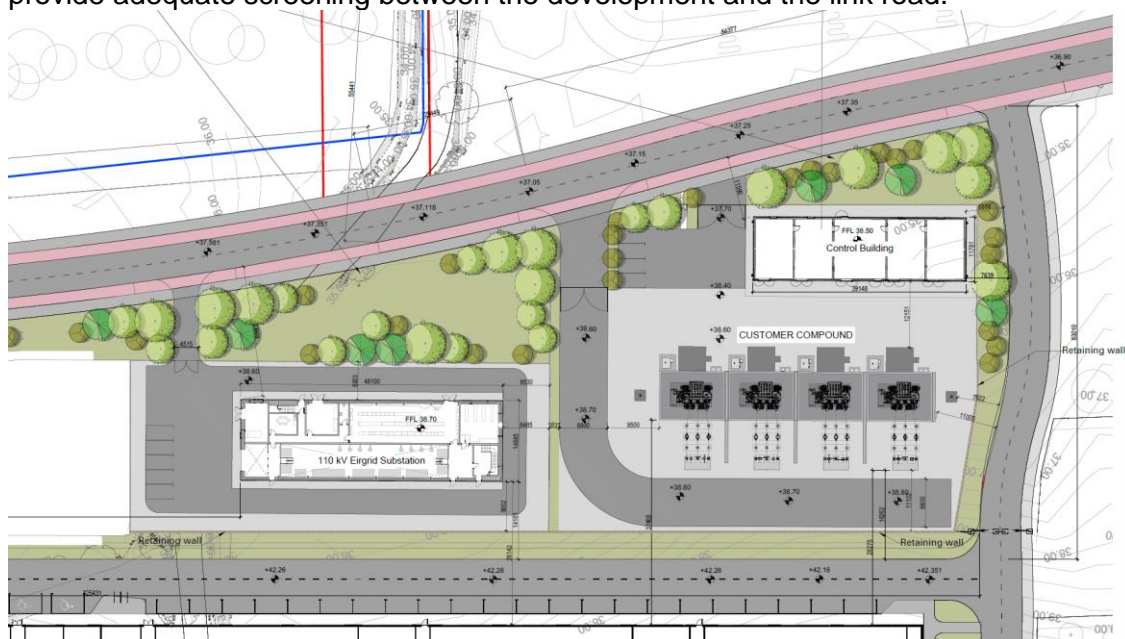


Figure 3.5 Option 3 – Chosen layout

Option 3, shown above in Figure 3.5, is the chosen site design. It is very similar to Option 1; however, it rectifies the access road issue with Option 1, with the chosen layout providing for separate access roads to both the customer compound and the substation. This layout removed any requirement of extensive construction works as the link road and the detention lake do not need to be relocated. There is ample parking, and the chosen design maximised the available green space between the substation and the permitted link road to provide for soft landscaping and allow for screening.

3.5 ALTERNATIVE PROCESSES

This section typically examines the project processes in relation to likely emissions to air and water, likely generation of waste and likely effect on traffic to determine the process that is least likely to impact on these parameters.

The underground 110 kV transmission line will become an integral part of the national high voltage electricity grid which is currently operated by ESB Networks. As such the underground cable installations must meet ESB Network's strict specifications to ensure it will be seamlessly absorbed into the national grid infrastructure and can provide a reliable power supply. Therefore, from an alternative 'process design' point of view, the flexibility to select alternative processes for integrating into the current national grid is not available to the Applicant.

In terms of the proposed processes, the proposed 110 kV Substation will employ the same electricity generation and transmission processes that are used by ESB Networks at their other facilities in Ireland and represents the most up-to-date and state of the art processes currently available. As appropriate, alternative processes are considered on an ongoing basis by ESB Networks as a part of each of their operations based on many factors including technical feasibility, environmental impact, efficiency, security, reliability and cost. Therefore, from an alternative 'process design' point of view, the flexibility to select alternative processes for integrating into the current national grid is not available to the Applicant.

3.6 ALTERNATIVE MITIGATION

For each aspect of the environment, each specialist has considered the existing environment, likely impacts of the Proposed Development and reviewed feasible mitigation measures to identify the most suitable measures appropriate to the environmental setting of the Proposed Development.

In deciding on the most suitable mitigation measure the specialist has considered relevant guidance and legislation. In each case, a comparison of environmental effects was made, and the specialist has reviewed the possible mitigation measures available and considered the use of the mitigation in terms of the likely residual impact on the environment. The four established strategies for mitigation of effects have been considered: avoidance, prevention, reduction and offsetting (not required in this development). Mitigation measures have also been considered based on the effect on quality, duration of impact, probability and significance of effects.

The selected mitigation measures are set out in each of the EIA Report Chapters.

3.7 CONCLUSIONS ON ALTERNATIVES

The design of the proposed 110 kV Substation has been selected with due regard to minimising the environmental and visual impact once in situ. The selection of the design has been constrained to the standard specifications required by ESB Networks for connection to the national grid.

The selected route for the 110 kV underground cable installation is the most suitable route for the Proposed Development from an engineering perspective taking into account access to land, cost and environmental effects.

It is considered that the Proposed Development location, layout and design is the most suitable choice to provide the support required to meet the power requirements of the Permitted ICT Facility.

4.0 POPULATION AND HUMAN HEALTH

4.1 INTRODUCTION

This chapter has been prepared to assess the likely significant impacts on Population and Human Health in respect of the Proposed Development.

The EU (2017) *Guidance on the preparation of the Environmental Impact Assessment Report* outlines that human health is a very broad factor that is highly project dependent. This guidance states:

The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the project, effects caused by changes in disease vectors caused by the project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study.

Human health should be considered in the context of environmental pathways which may affect health such as air quality, noise, water and soil quality. All can contribute to negative effects on human health by facilitating the transport of contaminants or pollutants. An evaluation of the effects of these pathways on health, by considering the accepted standards of safety in dose, exposure or risk of air quality and noise levels for example, is considered appropriate, as these standards have been arrived at via scientific and medical research.

The EPA (2015) Advice Notes explains that the scope of population and human health is project dependant but should consider significant impacts likely to affect aspects such as: convenience (expanded range of transport options); displaced settlement patterns (residential); employment opportunities; land use patterns; access for tourism, amenity, health impacts and/or nuisance due to noise, dust or water pollution; and health and safety. The EPA Guidelines (2022), notes that the transposing legislation does not require assessment of land-use planning, demographic issues or detailed socioeconomic analysis (EPA, 2022). Furthermore, the EPA Advice Notes (2015) states that issues such as employment, commercial competition, zoning, property prices, agri-business and other social and economic issues are dealt with by more specific instruments (such as the Planning Acts).

Furthermore, in accordance with the EPA (EPA, 2022), the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR. The likely significant impacts on with Human Health and Population in regards to issues such as soils, geology and hydrogeology, water, air quality, noise and vibration, traffic and landscape are addressed in detail within the following EIA chapters:

- Chapter 5 – Land, Soils, Geology and Hydrogeology;
- Chapter 6 - Hydrology;
- Chapter 8 - Air Quality and Climate;
- Chapter 9 - Noise and Vibration;
- Chapter 10 - Landscape and Visual Impact; and
- Chapter 12 - Traffic and Transportation.

Where these topics are dealt with in further detail elsewhere in this EIA Report, the relevant chapters have been cross referenced in this Chapter to provide the Planning Authority with a context for their determination.

The assessment of other health and safety issues that are carried out under other EU Directives are also relevant. These may include reports prepared under the Industrial Emissions, Waste Framework, Landfill, Strategic Environmental Assessment, Seveso III, Water Framework Directive, Floods or Nuclear Safety Directives. In keeping with the requirement of the amended Directive, an EIAR considers the results of such assessments without duplicating them.

4.2 METHODOLOGY

4.2.1 Relevant Legislation and Guidance

This chapter has been prepared in accordance with:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. Environment Protection Agency (EPA, 2022)
- Health Impact Assessment Guidance. Institute of Public Health (IPH), (IPH, 2021).
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report European Commission (EU, 2017)
- Advice Notes for Preparing Environmental Impact Statements Draft Environment Protection Agency (EPA, 2015).

This chapter follows these guidelines and will examine the health effects relevant to the Proposed Development as they relate to the relevant study area.

The description of the sensitivity, magnitude and significance, outlined within this assessment are based on the Health Impact Assessment Guidance (IPH, 2021) criteria, while the probability and duration of effects are based on the definitions set out within Section 3.7 of the 'Guidelines on information to be contained in Environmental Impact Assessment Reports' (EPA, 2022).

4.2.2 Data Sources of information

The following sources of information have been used in this assessment:

- 2011 Census carried out by the Central Statistics Office (CSO) 10 April 2011. Made available from <https://www.cso.ie/en/>
- 2016 Census carried out by the Central Statistics Office (CSO) 24 April 2016. Made available from <https://www.cso.ie/en/>
- Pobal HP Deprivation Index based on 2011 Census Data (CSO) Made available from <https://www.pobal.ie/>
- Pobal HP Deprivation Index based on 2016 Census Data (CSO) Made available from <https://www.pobal.ie/>
- Google maps available from <https://www.google.com/maps>
- OpenStreetMap and contributors available from <https://www.openstreetmap.org>
- GeoHive contributors and available from <https://www.geohive.ie/>

4.2.3 Study Area

There is no specific guidance available on an appropriate study area to focus the assessment of existing land use and/or permitted projects. The research area has been established using expert judgement and based on the accessibility of data and taking into consideration the potential for impact from the Proposed Development.

It is acknowledged that projects like the one proposed can have an impact on activity in a larger area than only the site itself. Generally, the closer to the works, the greater the potential for impacts. The most significant environmental impacts are likely to be confined within 50-150 m of the Proposed Development. Some effects from the Proposed Development, including air quality and traffic, might have a larger area of effect, and these are addressed in further detail in the corresponding expert assessments that set out the chapters within this EIAR.

The project being considered, is not expected to have Regional, National or International, or Transboundary impacts on Human Health. Therefore, the Study area has been restricted to the neighbouring community (site-specific population), and wider community (local population). A general study area of 1 km from the site location is included for population statistics, while the wider area of 2.5 km from the site location has been used to inform the baseline description of the area.

In the desk-based assessment of Population Health Sensitivity the use of Electoral Divisions (ED) statistics from CSO have been utilised. Electoral Divisions are the smallest legally defined administrative areas in the state; developed with the intention of producing areas roughly equivalent in both population and "rateable value" (CSO).

The selection ED within the study area has included EDs that are either entirely contained within or partially within 1 km of the Proposed Development site. In the case of the Proposed Development, the site is located within the Arklow Rural ED (038), and within 1 km of the site are the ED's of Arklow No. 1 Urban ED (001) and Ballylarkin ED (045). These EDs are located within Republic of Ireland, County Wicklow, and County Wexford.

4.2.4 Population Impact Assessment Categories

4.2.4.1 Assessment Sensitivity of Population

The assessment of significance of an impact is a professional appraisal based on the sensitivity of the receptor and the magnitude of effect. Within any area, the sensitivity of individuals in a population will vary. The Health Impact Assessment Guidance (IPH, 2021) sets out conceptual model of the different components of sensitivity (Figure 4.1). It uses criteria (segments) and indicative classifications (levels) to explore, and explain, a finding of sensitivity. The conclusion may be summarised as a high, medium, low or negligible sensitivity to change.

The existing sensitivity of the receiving environment (in terms of population and human health) has been appraised for the study area with a desk-based assessment of routine demographic and health indicators, rather than the use of surveys or collection of primary data. This includes analysis of existing data (based on the availability of information) from the Central Statistics Office (CSO) and Pobal to build up a profile of the baseline population information within the study area. Topographical maps and Google maps have also been used to inform the baseline description of the area to inform the proximity of the Site to areas of economic activity, employment, community infrastructure, emergency services, tourism and recreation amenities.

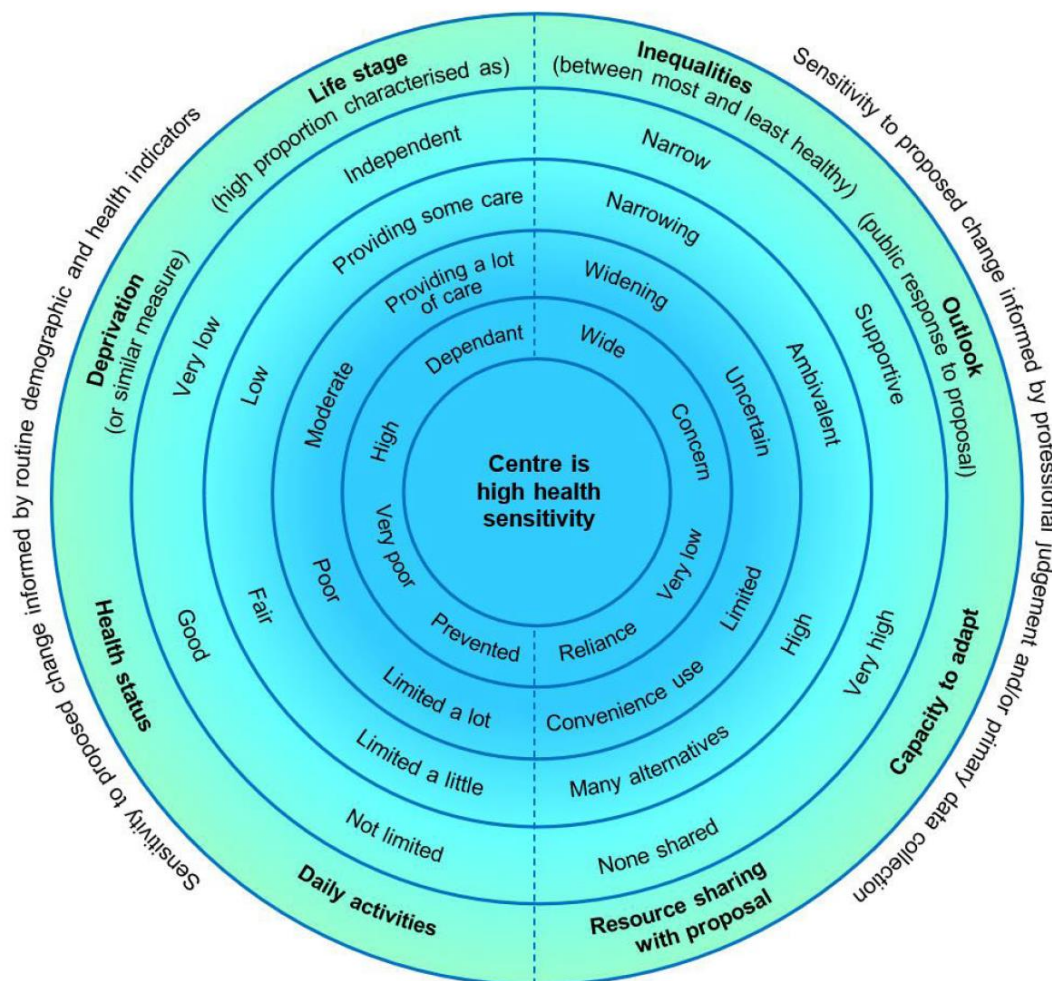


Figure 4.1 Health sensitivity: conceptual model (Source: Health Impact Assessment Guidance (IPH, 2021))

4.2.4.2 Magnitude of Impact

Magnitude considers the characteristics of the change which would affect the receptor as a result of the proposal. The Health Impact Assessment Guidance (IPH, 2021) sets out a conceptual model of the different components of sensitivity (Figure 4.2). Again, this model provides different components of *magnitude*. It uses criteria (segments) and indicative classifications (levels) to explore, and explain, a finding of *magnitude*. The conclusion may be summarised as a high, medium, low or negligible magnitude of change.

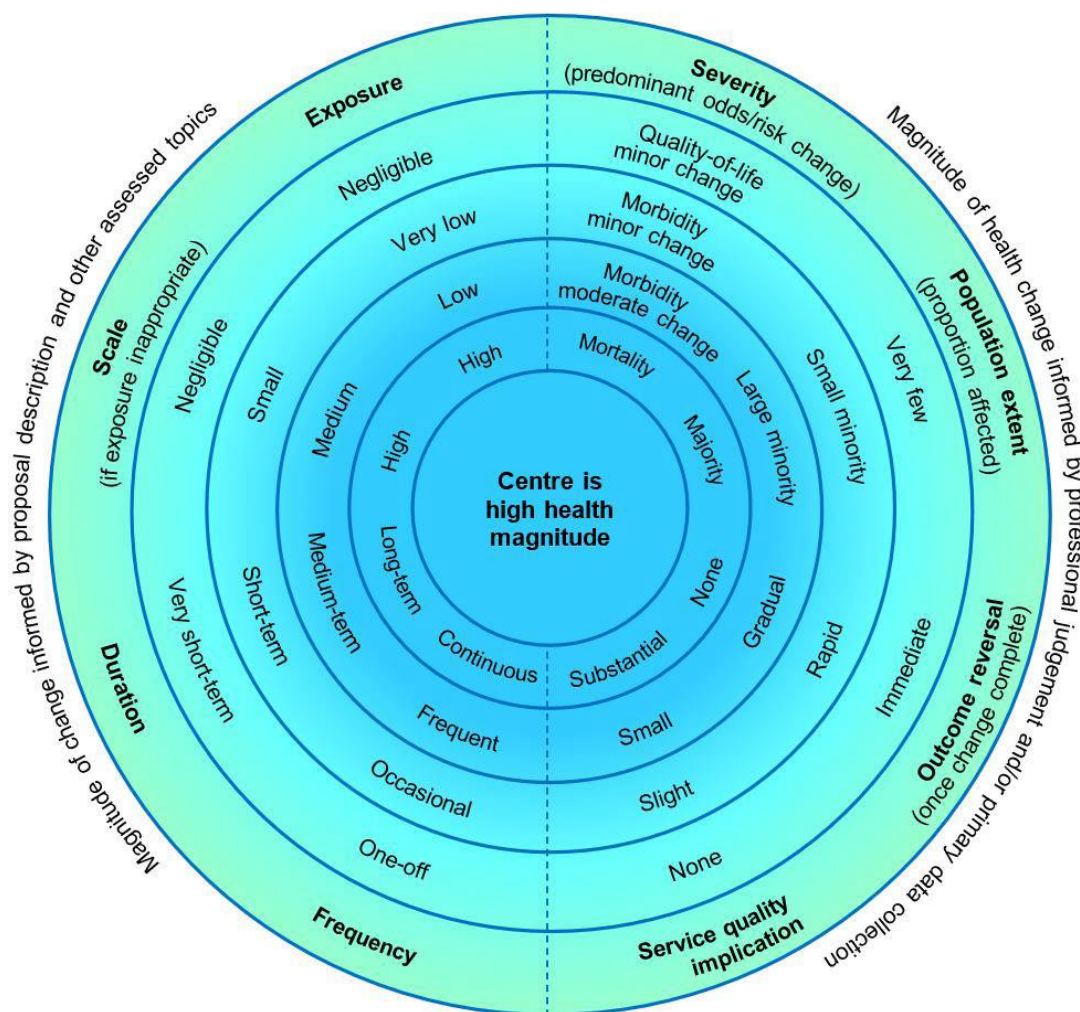


Figure 4.2 Health magnitude: conceptual model (Source: Health Impact Assessment Guidance (IPH, 2021))

4.2.4.3 Significance of Effects

Significance relies on informed, expert judgement about what is important, desirable or acceptable with regards to changes triggered by the proposal in question. The assessment of the significance of effects in this assessment is a professional appraisal and has been based on the relationship between the magnitude of the effects and the sensitivity of the receptor.

The Health Impact Assessment Guidance (IPH, 2021) sets out a conceptual model of the different components of significance. It uses criteria (segments) and indicative classifications (levels) to explore, and explain, a finding that a health effect is significant or not significant.

The Health Impact Assessment Guidance (IPH, 2021) model brings together different types of evidence, e.g. scientific literature, public health priorities, regulatory standards and health policy. The model thus not only take into account a range of evidence sources, but also a diversity of professional perspectives, e.g. academics, public health practitioners, regulators and policy makers.

The model below, includes the factors of magnitude of impact and the sensitivity of receptors as determined in Section 4.2.1 and Section 4.2.2 above. This EIA

assessment typically relies on regulatory thresholds, where there would be formal monitoring by regulators, to set out the acceptability or desirability of change to population health.

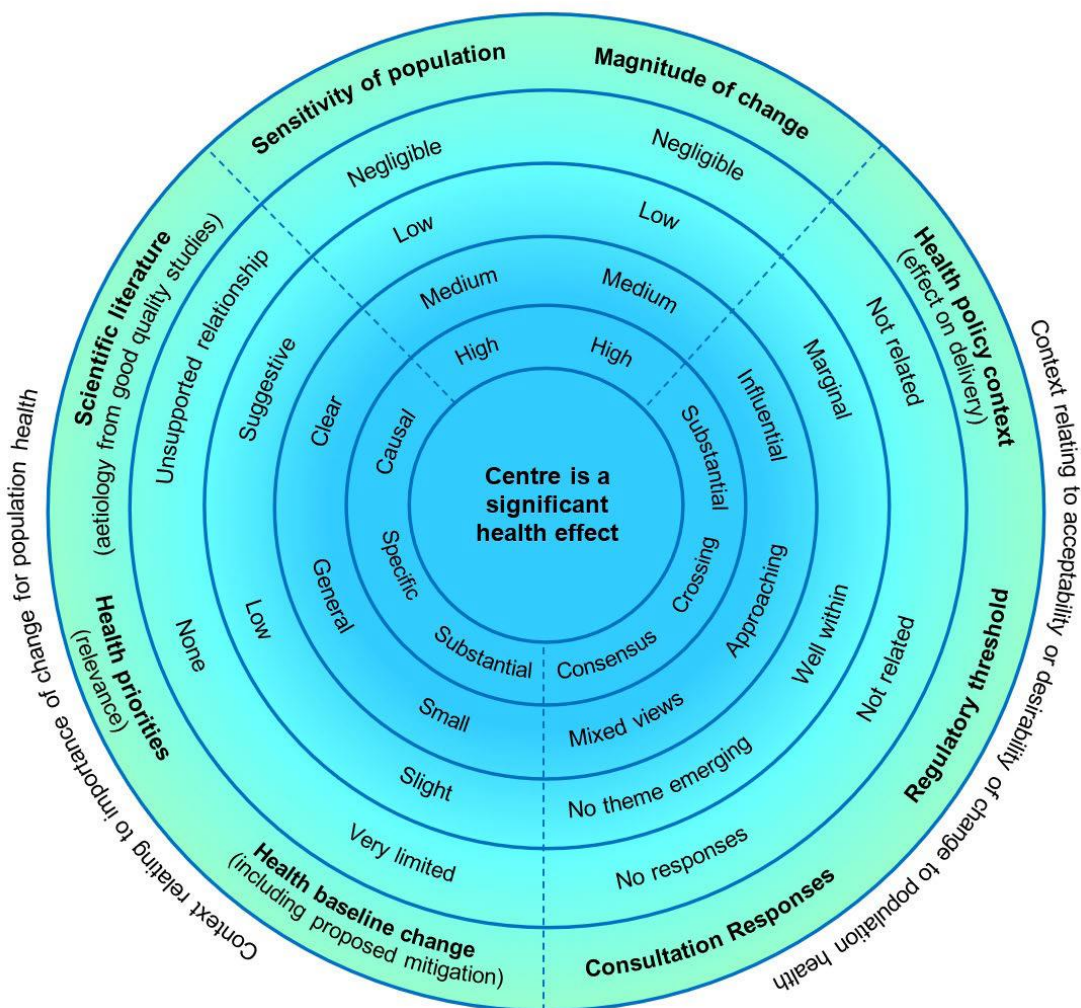


Figure 4.3 Health significance: conceptual model

4.2.5 Difficulties Encountered / Forecasting Methods

No particular difficulties were encountered in preparing the population assessment.

There are uncertainties in relation to assessing impacts on individuals or communities due to the lack of individual health data and the difficulty in predicting effects, which can only be based on general guidance and assumptions.

Forecasting methods and methodology, if any, are set out within the specialist chapters that this assessment relies upon.

4.3 RECEIVING ENVIRONMENT

4.3.1 Population Health Sensitivity within the Study Area

The purpose of the population health sensitivity assessment is to identify the likely sensitivity of the local population and its capacity to absorb change. It is considered

that for the purpose of this assessment that available data on: Population; Deprivation; Life Stage; and Health Status within the Study Area provides sufficient information to establish the population sensitivity and to provide the Planning Authority with a context for this assessment.

4.3.1.1 Population

The latest census data (2016) shows that the populations in Arklow Rural ED saw a higher population growth as compared with the ROI. Arklow No. 1 Urban ED and Ballylarkin ED also saw population growth but lower than that of the ROI (Table 4.1).

Table 4.1 Population change at National, County and Electoral Division level from 2011 – 2016
(Source: www.cso.ie)

Area	Population for Census Year		% Change 2011-2016
	2011	2016	
State - Republic of Ireland	4,588,252	4,761,865	+3.8
Arklow Rural ED	1,310	1,367	+4.4
Arklow No. 1 Urban ED	9,817	9,976	+1.6
Ballylarkin ED	837	855	+2.2

4.3.1.2 Deprivation

The Health Impact Assessment Guidance (IPH, 2021) outlines that impact assessments should consider if the population is already stressed by limited resources or high burdens as well as if groups are affected that have reduced access to financial, social and political resources. Deprivation differences between areas are indicative of social gradients, which are central to the consideration of health inequalities.

Deprivation statistics for Ireland are available from the Pobal HP Deprivation Index that shows the overall affluence and deprivation. This Index draws on data from the national Census and combines three dimensions of relative affluence and deprivation: Demographic Profile, Social Class Composition and Labour Market Situation that are measured by ten key socio-economic indicators from the Census of Population.

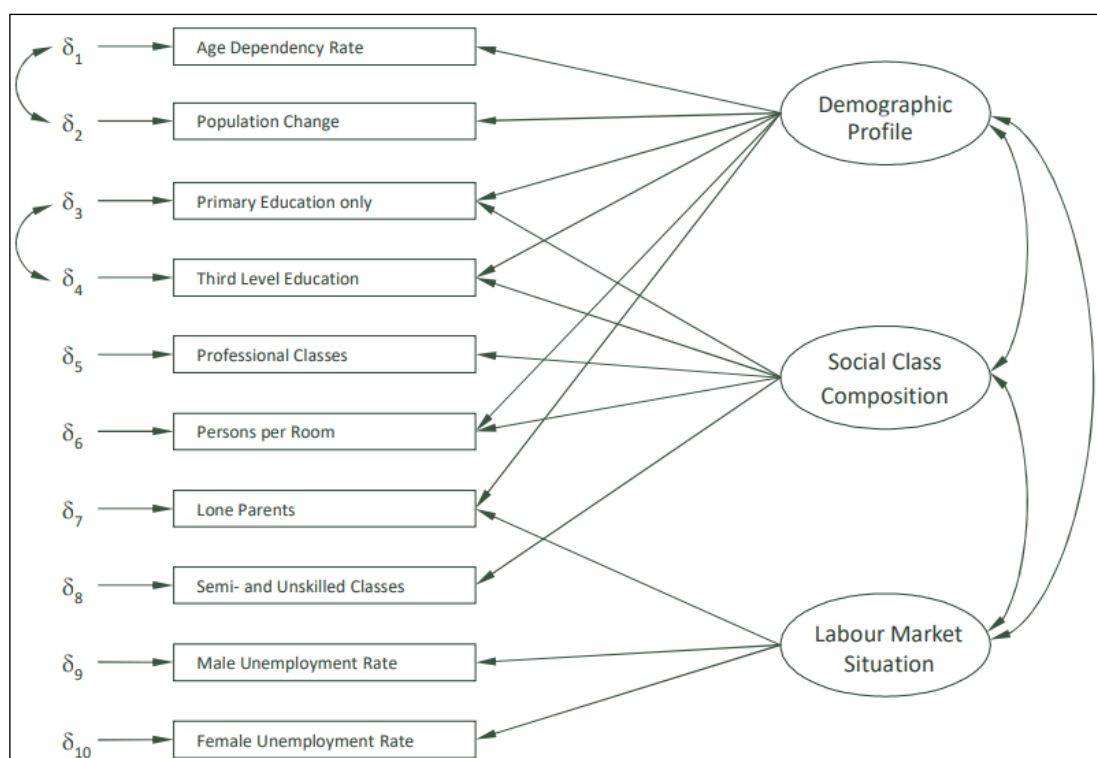


Figure 4.4 Basic Model of the Pobal HP Deprivation Index

The Pobal HP Deprivation Index Relative Index Score allows for the provision of descriptive labels with the scores, which are grouped by standard deviation as seen in Table 4.2 below.

In order to make a uniform assessment using the conceptual model as set out in Figure 4.1 above a relative Population Sensitivity the Deprivation Score of ‘Very disadvantaged’, or ‘Extremely disadvantaged’ would represent a high sensitivity. Conversely, a ‘Extremely affluent’ or ‘Very affluent’ would represent a very low sensitivity.

Table 4.2 Pobal HP Index Relevant Index Score labels (Source: Pobal HP Deprivation Index)

Deprivation Score	Pobal HP Description	Sensitivity of Population
> 30	Extremely affluent	Very Low
20 to 30	Very affluent	Very Low
10 to 20	Affluent	Low
0 to 10	Marginally above average	Low
0 to -10	Marginally below average	Moderate
-10 to -20	Disadvantaged	Moderate
-20 to -30	Very disadvantaged	High
< -30	Extremely disadvantaged	High

The data in Table 4.3 show the Pobal HP Deprivation Index Relevant Index Scores for the Study Area based on the 2016 Census. These figures show for the year 2016 show that the study area is ‘Marginally Below Average’ as compared with the ROI which is also ‘Marginally Below Average’. This indicates a Moderate Population Sensitivity (Deprivation) within the study area.

Table 4.3 Deprivation Score within the Study Area (Pobal HP Deprivation Index, 2016 Census)

Area	Deprivation Score	Pobal HP Description
State - Republic of Ireland	-4.2	Marginally Below Average
Arklow Rural ED	-2.34	Marginally Below Average
Arklow No. 1 Urban ED	-7.75	Marginally Below Average
Ballylarkin ED	-1.43	Marginally Below Average

4.3.1.3 Life Stage (Age Dependency)

The Health Impact Assessment Guidance (IPH, 2021) outlines that life-course analysis is often used in public health and reflects differing health sensitivities and needs at different ages. Typically, children and older people are particularly sensitive to change, including due to being dependants. Dependents are defined for statistical purposes as people outside the normal working age of 15-64. Dependency ratios are used to give a useful indication of the age structure of a population with young (0-14) and old (65+) shown as a percentage of the population of working age (15-64).

A low dependency ratio indicates that there is a larger proportion of working population age (15–64) years as compared to young (0-14) and old (65+). Conversely, a high dependency ratio indicates that there is a larger proportion of young (0-14) and old (65+) as compared to working population age. High dependency ratio can also indicate if some groups are more likely to be at home during the day (for example, due to childcare, or retired persons) and would therefore be more likely to be impacted by a development within the area.

Age dependency ratio are available through the Pobal Online Geo-Profiling tools (<https://maps.pobal.ie/>) which are based on the national Census.

The age dependency ratio for the study area is shown in Table 4.4 below. From these dependency ratios we can tell that the study area is less dependent when compared with ROI as a whole. Indicating a largely 'independent' population within the Study Area as compared ROI which can be defined as per the conceptual model as 'providing some care' to 'providing a lot of care'.

Table 4.4 Age Dependency Ratio within the Study Area (Pobal Geo-Profiling, 2016 Census)

Area	Age Dependency Ratio for Census Year	
	2011	2016
State - Republic of Ireland	49.30	52.70
Arklow Rural ED	35.57	36.74
Arklow No. 1 Urban ED	33.62	35.59
Ballylarkin ED	36.68	36.66

4.3.1.4 Health Status (General Health)

The CSO as part of the census records an overall self-reported measure of population health within Ireland. Areas with a poor health status are typically considered to be of a higher sensitivity and more susceptible to change in environmental conditions.

Table 4.5 below shows the Self-reported measure of population health within the Study Area compared to ROI. This shows the area predominately self-reports their health as 'Very Good' in-line with national trends.

Table 4.5 Self-reported measure of population health (CSO, 2016 Census)

Area	% population describing their general health					
	Not Stated	Very Bad	Bad	Fair	Good	Very Good
State - Republic of Ireland	3.33%	0.29%	1.32%	8.04%	27.65%	59.38%
Arklow Rural ED	2.85%	0.36%	0.88%	7.61%	25.68%	62.62%
Arklow No. 1 Urban ED	2.09%	0.31%	1.68%	9.27%	28.41%	58.24%
Ballylarkin ED	1.63%	0.12%	0.94%	6.08%	24.91%	66.32%

4.3.1.5 Ability to perform daily activities

People's ability to perform day-to-day activities is relevant to population sensitivity, particularly where there are changes in access to services or community amenities. Persons with disabilities can also be more susceptible to the changes in environmental conditions. The CSO as part of the census records an overall self-reported measure of persons with disabilities within Ireland.

Table 4.6 details the number of persons with a disability compared to the population as a whole. The data shows that the Arklow Rural Ed and Ballylarkin ED have a lower % of Persons with a disability than the national average; indicating that for persons within the area there are relatively limited restrictions on daily activity. Arklow No. 1 Urban ED has a higher % of Persons with a disability than the national average; indicating that there is a slight increase of restrictions on daily activity.

Table 4.6 Persons with a disability (CSO, 2016 Census)

Area	Persons with a disability	Population	% Persons with a disability
State - Republic of Ireland	643,131	4,761,865	14%
Arklow Rural ED	169	1,367	12%
Arklow No. 1 Urban ED	1,575	9,976	16%
Ballylarkin ED	83	855	10%

4.3.1.6 Summary of Population Health Sensitivity

The sensitivity of the surrounding area has been considered based on the details of the published data available from CSO and Pobal. The study area has seen a population growth between the 2011 and 2016 census. The Pobal HP Deprivation Index shows the area be Marginally Below Average indicating a Moderate Population Sensitivity (Deprivation) within the study area.

There is a low age dependency ratio, therefore a large proportion of the population is within working age, thus considered as largely independent and judged to be not sensitive to change. The information presented above for the study area shows, a high proportion [66 – 58%] describes their health status as 'Very Good' and low proportion as 'Bad' or 'Very Bad'. The data shows that no. 2 ED within the study area have a lower % of Persons with a disability than the national average; indicating that for persons within the area there are relatively limited restrictions on daily activity. No. 1 ED has a higher % of Persons with a disability than the national average; indicating that there is a slight increase of restrictions on daily activity.

The population within the study area is therefore not particularly sensitive to change, with a ranking of low to medium sensitivity.

4.3.2 Location and Character of the Local Environment

The purpose of describing the location and character of the local environment provides useful information on the current local community and usage within the study area provide the Planning Authority with a context for this assessment. This includes community and social infrastructure that covers a range of services and facilities that meet local and strategic needs and contribute towards a good quality of life. In this context it includes local business, residential areas, education, health facilities, emergency services, and places of worship, and green infrastructure.

Furthermore, the baseline identifies tourism and landscape amenity within the study Area which provides an indication on current intrinsic values placed on the area for local, national and international users that may be impacted by the Proposed Development.

The local environment also includes areas of natural resources that relate to populations and human health that may be impacted by the Proposed Development, this includes economic resources, recreational and bathing waters, and drinking water resources.

While a general study area of ED's within 1 km from the site location is included for population statistics, the wider area of 2.5 km from the site location has been used to inform the baseline description of the area.

4.3.2.1 Community and Social Infrastructure within the Study Area

Residential and Employment areas

The site is located adjacent to the Kish Business Park and is located on lands predominantly zoned E1 – Employment and E Special – Special Employment under the Arklow and Environs Local Area Plan 2018 – 2024. These zonings designate land '*To provide for the development of enterprise and employment*' and '*To provide for a large, single, undivided employment development*' respectively.

Notable facilities within the vicinity of the site include; Armstrong Timber Engineering, ASL Safety & Training (plant and machinery), Concept Joinery (furniture), Dolphin Distributors (distribution service), Arc Building Products (manufacturer), Glenhaven Foods (poultry processing), Elavon Merchant Services (financial institution), Paramount Packaging Limited (food packaging distribution), Senator Windows and Doors Wicklow (window installation service) and Servier (Ireland) Industries Ltd (pharmaceuticals).

The site is also adjacent to areas zoned RE – Existing Residential and passes through a section of land zoned OS2 – Open Space 2. OS2 lands are typically used for buffer zones, green corridors and other uses that protect and enhance the natural environment. Other uses that are deemed compatible with proper planning and sustainable development may be open for consideration where they do not undermine the purpose of this zoning.

The closest shopping centres of note is the Bridgewater Shopping Centre c. 2.5 km north east of the site.

Notable concentrations of residential settlements occur to the north of the site in the nearby Arklow urban area. To the south, west and east of the site there are scattered residential developments typical of their rural setting.

There are a number of noise-sensitive locations, both private and commercial in the vicinity of the proposed development. Further information can be found in Chapter 9, Noise and Vibration.

Education, Childcare, Schools

There are a number of primary and secondary schools in the vicinity of the Proposed Development including:

- Gaelscoil an Inbhir Mhóir, c. 660 m north;
- Carysfort Mixed National School, c. 1 km north east;
- Glenart College, c. 1.1 km north;
- St Mary's College, c. 1.6 km north east;
- Saint Mary's Girls National School, c. 1.7 km north east;
- Arklow CBS, c. 1.5 km north east;
- St John's Senior National School, c. 1.5 km north east;
- Gaelcholáiste na Mara, c. 1.8 km north; and
- SS Michael and Peter Junior School, c. 1.9 km north east.

The closest third level institution in the area is South East Technological University Wicklow, located c. 25 km north of the site.

Healthcare Services

The Healthcare Services within the study area are Arklow Health Centre c. 2.0 km north east, Primary Care Health Center c. 2.0 km north east and Caredoc Arklow c. 1.9 km north east.

There are no hospitals within the study area, the nearest is St. Columcille's Hospital, Loughlinstown, Co. Dublin, located c. 50 km north of the site.

Emergency Services

The Arklow Garda Station is located c. 1.9 km north east of the site and the Arklow Fire Station is located c. 520 m north east of the site.

Places of Worship

There are five places of worship in the vicinity of the development:

- Arklow Christian Community Church, c. 1.6 km north east of the site;
- Saint Saviour's Church, c. 1.7 km north east of the site;
- St Mary's & Peter's Catholic Church, c. 1.8 km north east of the site;
- Banner of Love Church Arklow, c. 2.1 km north east of the site; and
- Arklow Baptist Church, c. 2.1 km north east of the site.

Green Infrastructure, Landscape and Amenity, within the Study Area

The nearest noteworthy features for recreational use are Arklow Rock Parnells GAA Club located c. 500 m to the north, and Glenart Wood located c. 1.4 km north. The Woods feature a 5 km looped walking trail. The Moneylane Stream flows around the site boundary, flowing in a southerly direction to the west of the site, an easterly direction to the south of the site and finally a northerly direction to the east of the site, before reaching the Ballyduff Stream and ultimately the Avoca River. Further east of

the site is the Wicklow coastline, featuring The Cove, Hanging Rock Beach and the Arklow Rock Walking Trail.

In terms of landscape amenity, large buildings and infrastructure are the dominant elements of the landscape within the Kish Business Park and visual amenity is limited. This area can be considered of low sensitivity to the Proposed Development, which is of similar character. The surrounding primarily agricultural land within the Study Area has a Landscape Character Area ranging from Low to Medium. To the east of the site along the coastline the Landscape Character Area is High. There are no listed or scenic views, no landscape or amenity designations or protected trees pertaining to the site, and no protected structures or National Monuments on the site.

4.3.2.2 Tourism within the Study Area

Tourism is returning to strong growth and continues to play a hugely influential role in Ireland's economic success.

The development site is located within Wicklow County which has 64 km of scenic coastline, extensive woodlands, the Wicklow Mountains and a number of attractive towns as well as several centres of residential, retail and service industries. The Tourism Statement of Strategy and Work Programme 2017 – 2022 outlines tourism in the county as a range of:

'Outstanding landscapes and natural beauty and rich cultural and heritage assets. Top attractions include:

- *Glendalough Monastic City;*
- *Powerscourt Estate;*
- *Wicklow's Historic Gaol;*
- *National Sealife Centre;*
- *The Bray to Greystones Cliff Walk;*
- *Russborough House;*
- *Kilmacurragh Botanic Gardens;*
- *The Wicklow Way;*
- *Avondale Forest Park; and*
- *Killruddery House.*

In addition to the major attractions listed, some of Ireland's best golf courses, excellent harbours, a world class marina and top of the range sports facilities, Wicklow has a wide range of walks and trails.'

The development site is located next to an existing business park and is not located near any areas of significance or local tourism. There are no. 2 areas zoned T - Tourism under the Arklow and Environs Local Area Plan 2018 – 2024 within the Study Area, the Moneylands Farm and BnB c. 650 m north east of the site, and a currently undeveloped site c. 200 m east of the site. Tourism is not a major industry in the immediate environs of the site.

4.3.2.3 Natural Resources within the Study Area

Geological Heritage, and Economic Resources

A review of Geological Survey Ireland online maps has shown that there are no areas of geological heritage within the Study Area. There is no. 1 active quarry c. 1.2 km to the east of the site, the Arklow (Parnell) Quarry, operated by Roadstone Ltd and

producing aggregates and fill materials. The processing which happens at the quarry includes excavator, blasting, crushing, grading, fixed plant and mobile plant. There are no. 8 mineral localities within the study area. Mineral types include granite, iron, ironstone, sand, silica, marl, and coal.

Recreational Waters and Bathing Waterbodies

A review of Environmental Sensitivity Mapping online maps that includes the Register of Protected Areas (RPA) under the Water Framework Directive (WFD) has shown that there is no. 1 protected Recreational Waters or Bathing Waterbodies within the Study Area. The Clogga Recreational Water (Bathing) (Protected Area Code: PA3_0130) is located c. 2 km from the site. The site is adjacent to the Moneylane Stream, that flows to the Avoca River and ultimately to Arklow Harbour, there are no RPA located there.

Drinking Water Resources

A review of Environmental Sensitivity Mapping and Geological Survey of Ireland online maps that includes the Water Abstraction locations, and Groundwater Source Protection Areas has been undertaken. This shows no Groundwater Source Protection Areas within the Study Area. There are a number of Water Abstraction locations of varying depths within the study area for industrial, domestic and agricultural use.

Risk of Major Accident Hazards or Disasters

The potential for a project to cause risks to human health, cultural heritage or the environment due to its vulnerability to external accidents or disasters is considered where such risks are significant, e.g. the potential effects of floods on sites with sensitive facilities. Where such risks are significant then the specific assessment of those risks in the form of a Seveso Assessment (where relevant) or Flood Risk Assessment may be required.

Landslides, Seismic Activity and Volcanic Activity

There is a negligible risk of landslides occurring at the site and in the immediate vicinity due to the topography and soil profile of the site and surrounding areas. There is no history of seismic activity in the vicinity of the site. There are no active volcanoes in Ireland so there is no risk of volcanic activity. Further detail is provided in Chapter 5 (Land, Soils, Geology and Hydrogeology).

The Proposed Development site is not vulnerable to landslides, seismic activity or volcanic activity. Therefore, there is no significant potential for the Proposed Development to cause risks to human health due to its vulnerability to landslides, seismic activity or volcanic activity.

Proximity to Seveso or Industrial Emissions Sites

The potential for major accidents to occur at the facility has also been considered with reference to establishments registered with the Health and Safety Authority in accordance with the Control of Major Accident Hazards (COMAH) Regulations that implements the Seveso III Directive.

There are no significant risks in relation to the Proposed Development and Major Accident Hazards.

The site is not a Seveso facility and is not within the consultation distance of any Seveso facility.

In the vicinity of the site there is no. 1 existing IE Licenced site that could potentially give rise to cumulative effects. Sigma Aldrich Ireland Limited, located on the Vale Road, Ballyraine Lower, Arklow, c. 1.9 km from the site is an EPA IE Licenced site (P0089-05) with regard to chemicals manufacturing.

Risk of Flooding

The potential risk of flooding on the site was also assessed. As stated in Section 6.3.6 of Chapter 6 (Hydrology), a Flood Risk Assessment was carried out by AWN Consulting. This analysis showed that the development site is outside any identified flood zones and does not indicate the site is at risk from any fluvial, pluvial or coastal flooding event. The development site is situated in Flood Zone C with respect to coastal and fluvial flooding and the 2 No. 110kV transmission lines will be underground. Therefore, this does not pose a risk to flooding. Therefore, the development is classified as appropriate for this flood zonation. There are no historic flood events recorded in the vicinity of the site and there is no record of pluvial flooding events within the site boundaries.

4.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The Proposed Development is located on a Site with a total area of c. 8.68 hectares (ha) of predominantly agricultural land.

The '110 kV Substation Site', is located within the Kish Business Park and comprises part of an irregularly shaped field bounded by hedgerows typical of its agricultural setting. The 110 kV Substation Site is currently in use as agricultural lands. To the south of the 110 kV Substation Site is Armstrong Timber Engineering, there are agricultural lands to the north and east, and the Dublin-Rosslare rail line, R772, and M11 are located to the west. The 110 kV Substation Site is presently bounded by greenfield agricultural lands to the north and east, which are subject to permitted development for a 3 no. ICT Facility Buildings and associated development under Wicklow County Council (WCC) Reg. Ref.: 201088 (hereafter referred to as the 'Permitted ICT Facility').

The 'Circuit Route A', is a linear route of 2934 m; between the 110 kV Substation Site to the existing 110 kV Arklow – Banoge overhead line located to the west. This route crosses perpendicular to the Dublin-Rosslare rail line, then follows the R772 to cross the culverted Moneylane Stream and underneath the M11 motorway at Junction 21, then traverses along the L6187, enters agricultural lands at Knockeneahan Road (L2190), and terminates at the existing 110 kV Arklow – Banoge overhead line.

The 'Circuit Route B', is a linear route of 2216 m; between the 110 kV Substation Site to the existing 110 kV Arklow – Banoge overhead line located to the west. The route crosses perpendicular to the Dublin-Rosslare rail line, the Moneylane Stream, R772, M11, then traverses an IDA Business Park, and open agricultural lands adjacent to the M11 and Knockeneahan Road (L2190) and terminates at the existing 110 kV Arklow – Banoge overhead line.

The Moneylane Stream is situated to the west of the 110 kV Substation Site and flows in a northerly direction. The 110 kV Substation Site and Permitted ICT Facility is drained by a series of agricultural ditches which connect to the Moneylane Stream and ultimately discharges into the Avoca River.

The Proposed Development is described in further detail in Chapter 2 (Description of the Proposed Development).

4.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

The main potential impacts on population and human health from the Proposed Development are potential for spills/leaks, air emissions, noise, visual, and traffic impacts. The baseline environment, pollution pathways, relevant mitigation measures and residual impacts have been assessed in greater detail within the corresponding specialist chapters; Chapter 5 (Soils, Geology and Hydrogeology); Chapter 6 (Hydrology); Chapter 8 (Air Quality and Climate), Chapter 9 (Noise and Vibration); Chapter 10 (Landscape and Visual); and Chapter 12 (Traffic and Transportation).

A summary of the main potential impacts as they are relevant to human health criteria during construction, commissioning, operation and decommissioning of the Proposed Development is presented herein.

4.5.1 Construction Phase

4.5.1.1 Potential Impacts on Businesses and Residences

The main potential impacts on local businesses and residences associated with the Proposed Development will be in relation to nuisances; air quality, noise, visual impact and traffic. The potential impacts and mitigation measures to address them are dealt with within the corresponding chapters of this EIA Report as follows:

- Chapter 8 – Air Quality and Climate
- Chapter 9 – Noise and Vibration
- Chapter 10 – Landscape and Visual Impact
- Chapter 12 – Traffic and Transportation

Construction will have an indirect positive effect on support industries such as builder suppliers, construction material manufacture, maintenance contracts, equipment supply, landscaping and other local services. There will also be a need to bring in specialist workers on a regular basis that may increase the above estimated working population at times. Specialists are only likely to stay for shorter periods depending on the nature of the work. The construction phase, therefore, is considered to have the potential to have an ***imperceptible, temporary and neutral*** impact on the economy and employment of the local and wider area.

4.5.1.2 Potential Impacts on Landscape Amenity and Tourism

The site is classified as 'urban area' in the WCDP Landscape Assessment. These are the areas of (generally) lowest landscape sensitivity in the county. Even though the landscape sensitivity to the proposed development is not high, the site will be fundamentally changed by the development. There will be landscape impacts to nearby residential properties on the Clogga road unless mitigated. There are no significant visual effects from the development, however, there are a small number of residential properties in the area, and a tourism site (Moneylands Farm), which are exposed to the site and would unavoidably experience some reduction in visual amenity as a result of the development.

4.5.1.3 Potential Impact from Land and Water Emissions on Human Health

With reference to Chapter 5 (Soils, Geology and Hydrogeology) and Chapter 6 (Hydrology) during construction of the Proposed Development, excavation works will occur at the proposed site and along the 110Kv underground cable encompass removing material along roadways. Due to the lack of previous development at the site and the historical agricultural use at the site, the risk of contaminated soils being present onsite is low and this was confirmed by onsite soil sampling and analysis. However, it is assumed that the material removed along the roadways is expected to be contaminated. This material will be required to be removed and disposed by a licenced contractor to an appropriate waste facility. Material that is exported from site, if not correctly managed or handled, could impact negatively on human beings (onsite and offsite) as well as water and soil environments.

Contaminated water which arises from construction sites can pose a significant short-term risk to groundwater quality for the duration of the construction if contaminated water is allowed to percolate to the aquifer.

There is a risk of accidental pollution incidences from the following sources:

- Suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates)) – arising from excavation and ground disturbance;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage;

During the construction phase at this site there is potential for an increase in run-off due to the introduction of impermeable surfaces and the compaction of soils. There is a possible direct pathway from the excavations works area to the surface water drainage ditches onsite and the Moneylane Stream via over land flow.

4.5.1.4 Potential Impact from Air Quality on Human Health

The greatest potential impact on air quality during the construction phase of the Proposed Development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 350 m of a construction site, the majority of the deposition occurs within the first 50 m. As per Section 8.2.2.1 the major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (movement of heavy vehicles).

There are no demolition works associated with the Proposed Development. The sensitivity of the area, as determined in Section 8.3.3, is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. As outlined in Table 8.8, this results in an overall medium risk of dust soiling impacts and a low risk of dust related human health impacts as a result of the proposed earthworks activities.

The dust emission magnitude for the proposed construction activities can be classified as small as a worst-case as the total building volume will be less than 25,000 m³. As outlined in Table 8.9, this results in an overall low risk of dust soiling impacts and a negligible risk of human health impacts as a result of the proposed construction activities.

As outlined in Table 8.10, this results in an overall low risk of dust soiling impacts and a negligible risk of human health impacts as a result of the proposed trackout activities.

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase. Particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the Proposed Development satisfy the DMRB assessment criteria in Section 8.2.2.1. It can therefore be determined that the construction stage traffic will have an **imperceptible, direct, neutral and short-term** impact on air quality.

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO₂ and N₂O emissions. The Institute of Air Quality Management document Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2014) states that site traffic and plant is unlikely to make a significant impact on climate. As per Section 8.3.4, Ireland had total GHG emissions of 46.19 Mt CO₂eq in 2021, emissions from the construction phase of the Proposed Development will be a small fraction of this. Therefore, the potential impact on climate is considered to be **imperceptible, direct, neutral and short-term**.

4.5.1.5 Potential Impact from Noise and Vibration on Human Health

Exposure to excessive noise is becoming recognised as a large environmental health concern. According to the 2015 European Commission report 'Noise Impacts on Health', (European Commission, 2015), the most common effects of noise on the vulnerable include;

- Annoyance
- Sleep Disturbance
- Heart and circulation problems
- Quality of Life
- Cognitive Process
- Hearing

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of road traffic, vibration is perceptible at around 0.5mm/s and may become disturbing or annoying at higher magnitudes. Noise and vibration impacts associated with the development have been fully considered within Chapter 9 of the EIA Report.

As detailed in Chapter 9 Noise and Vibration, construction works associated with cable works will be the dominant source of noise at the nearest noise sensitive locations when they occur. Other construction activity from the Proposed Development is at sufficient distance from a significant proportion of the proposed cable works, so that when they occur at the same time, cumulative issues will not be a material issue. It is possible that significant construction noise occurs while the works are being carried out at short distances from noise-sensitive locations. However, as the works will proceed along the route the duration of the effect is considered brief.

In terms of noise associated with the gird connection route the associated effect is stated to be **Negative Significant and Brief**. In relation to the noise from the substation construction, the associated effect is stated to be **Negative, Slight and Temporary**.

Additional traffic introduced onto the local road network due to the construction phase of the Proposed Development will not result in a significant noise impact. In terms of noise associated with these construction activities the associated effect is stated to be **Neutral, Imperceptible and Temporary**.

In terms of vibration, due to the distance of activities from the site to the nearest sensitive locations and controlling vibration levels to those detailed in Table 9.7 of Chapter 9 the associated effect is stated to be **Neutral, Imperceptible and Temporary**.

4.5.1.6 Potential Impact from Traffic and Transportation on Human Health

The World Health Organisation Report 'Health Effects and Risks of Transport Systems: The Hearts Project' (World Health Organisation, 2006) states that road traffic is a major cause of adverse health effects - ranking with smoking and diet as one of the most important determinants of health in Europe. The report states;

“Traffic-related air pollution, noise, crashes and social effects combine to generate a wide range of negative health consequences, including increased mortality, cardiovascular, respiratory and stress-related diseases, cancer and physical injury. These affect not only transport users but also the population at large, with particular impact on vulnerable groups such as children and elderly people, cyclists and pedestrians”

In the Department of Communications, Climate Action & Environment document *Cleaning Our Air – Public Consultation to Inform the Development of a National Clean Air Strategy* vehicle emissions are included as a key source of health impacts in Ireland (DOCCA&E, 2017).

An assessment of the additional traffic movements associated with the Proposed Development during the construction phase is presented in Chapter 12 (Traffic and Transportation).

As set out in Chapter 12 (Traffic and Transportation) a traffic assessment was completed to determine the impacts of the construction traffic on the surrounding road networks. It was determined that the higher proportional additional trips on the Clogga Road are due to the existing flows being relatively low, whilst the additional flows on the other two links the R772 and L6187 are insignificant compared to existing flows.

As the works associated with the ducting and cabling works will require trenching and reinstatement in the R772 and L6187 public roads there will be a need to carry out the works under traffic management via shuttle working. This will impact traffic locally to the works. These works will be carried out over only part of the eight month time frame required for this part of the works.

4.5.1.7 Potential Impacts from Major Accident Hazards and/or Natural Disasters on Population and Human Health

The Proposed Development has the potential for an impact on the health and safety of workers employed during the construction phase. The activities of the applicant's contractors during the construction phase will be carried out in accordance with the

Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013) to minimise the likelihood of any impacts on workers' health and safety.

As outlined in Section 4.3.2 there is a negligible risk of external natural disasters; including landslides, seismic activity, volcanic activity and sea level rise. There is a negligible risk of major accidents to occur at the facility due to the lack of proximity to Seveso/Control of Major Accident Hazards (COMAH) Regulations sites.

As stated in Chapter 6 (Hydrology) the site is in Flood Zone C. Therefore, this does not pose a risk to flooding. Therefore, the development is classified as appropriate for this flood zonation. There are no historic flood events recorded in the vicinity of the site and there is no record of pluvial flooding events within the site boundaries.

The potential effect is therefore **imperceptible**, and unlikely, respect of Major Accident Hazards or Natural Disasters on Population and Human Health during the Construction Phase of the Proposed Development.

4.5.2 Operational Phase

4.5.2.1 Potential Impacts on Businesses and Residences

The main potential impacts on local businesses and residences associated with the Proposed Development will be in relation to nuisances; air quality, noise, visual impact and traffic. The potential impacts and mitigation measures to address them are dealt with within the corresponding chapters of this EIA Report as follows:

- Chapter 8 – Air Quality and Climate
- Chapter 9 – Noise and Vibration
- Chapter 10 – Landscape and Visual Impact
- Chapter 12 – Traffic and Transportation

It is not expected there will be any likely significant effects on local residential figures in association with the operation of the Proposed Development.

4.5.2.2 Potential Impacts on Amenity and Tourism

The site would be fundamentally changed by the development. The topography would be altered, and the grassland fields and mature hedgerows removed (erasing the long-standing field pattern) and replaced by industrial scale buildings and ancillary infrastructure. While the impact would be of high magnitude on the site itself, at the wider scale (landscape scale) the development would be in keeping with the plan-driven trend of change towards an urban area dominated by employment uses. The landscape sensitivity can be considered **low-medium**, the magnitude of change to the landscape would be **low-medium**, with the significance of the potential landscape effects can be classified **'slight' and neutral**.

Seven viewpoints representative of the receiving environment were selected for visual impact assessment informed by verified photomontages. The viewpoints were selected to represent the range of potential visual receptors in terms of sensitivity, as well as views from various angles and distances from the site. Further information of this assessment can be found in Chapter 10 Landscape and Visual Impact, with a summary of effects and sensitivity in Table 10.6.

4.5.2.3 Potential Impact from Land and Water Emissions on Human Health

With reference to Chapter 5 (Soils, Geology and Hydrogeology) and Chapter 6 (Hydrology) there will be a minimal increase in hardstanding area associated with the Proposed Development. The total additional hardstanding area that will discharge collected runoff into the Permitted ICT Facility storm sewer is 0.412ha. There is a potential for leaks and spillages from vehicles along access roads and in parking areas. Any accidental emissions of oil, petrol or diesel could cause soil/groundwater contamination if the emissions are unmitigated.

In the event of a fire at the 110 kV substation facility, firewater could become contaminated and in the absence of mitigation may contaminate soil and groundwater.

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

There is a potential for leaks and spillages of the fuel and oil during storage and transport. In addition to this there is a potential for localised leaks and spillages from vehicles along access roads and in parking areas. Any accidental emissions of oil, petrol or diesel could cause contamination if the emissions enter the water environment unmitigated.

4.5.2.4 Potential Impact from Air Emissions on Human Health

During operation, the cables will be buried underground and therefore there will be no emissions to atmosphere. There is the potential for maintenance vehicles accessing the substation site to result in emissions of NO₂, PM₁₀/PM_{2.5} and CO₂. However, due to the infrequent nature of maintenance activities and the low number of vehicles involved emissions are not predicted to be significant. A detailed air quality and climate assessment was scoped out for the operational stage of the development as per the UK DMRB screening criteria. Operational stage impacts to air quality and climate are predicted to be imperceptible, direct, neutral and long-term.

4.5.2.5 Potential Impact from Noise and Vibration Emissions on Human Health

Exposure to excessive noise is becoming recognised as a large environmental health concern. According to the 2015 European Commission report 'Noise Impacts on Health', (European Commission, 2015), the most common effects of noise on the vulnerable include;

- Annoyance
- Sleep Disturbance
- Heart and circulation problems
- Quality of Life
- Cognitive Process
- Hearing

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of road traffic, vibration is perceptible at around 0.5mm/s and may become disturbing or annoying at higher magnitudes. Noise and vibration impacts associated with the development have been fully considered within Chapter 9 of the EIA Report.

The EirGrid Evidence Based Environmental Studies Study 8: Noise – Literature review and the evidence-based field study on the noise effects of high voltage transmission development (May 2016) found that with 110Kva substations the measured noise levels were below the night time threshold limit and well below the daytime threshold limits for serious and moderate annoyance in outdoor living areas. The substation installation will have comparable noise emissions to the 110 kV unit and considering the nearest noise sensitive locations, which are those along Ballynattin Road (the R772) at a distance of 275 m, the noise emissions from the substation will be inaudible at the nearest NSLs. The resultant noise effect is stated to be **Neutral Imperceptible Long Term**.

Due to the fact that the proposed 110 kV lines will be located underground there are no operational operation noise impacts associated with the Proposed Development. Mitigation measures are therefore not required. The resultant noise effect is stated to be **Neutral, Imperceptible and Long Term**.

4.5.2.6 Potential Impact from Traffic and Transportation on Human Health

The World Health Organisation Report ‘Health Effects and Risks of Transport Systems: The Hearts Project’ (World Health Organisation, 2006) states that road traffic is a major cause of adverse health effects - ranking with smoking and diet as one of the most important determinants of health in Europe. The report states;

“Traffic-related air pollution, noise, crashes and social effects combine to generate a wide range of negative health consequences, including increased mortality, cardiovascular, respiratory and stress-related diseases, cancer and physical injury. These affect not only transport users but also the population at large, with particular impact on vulnerable groups such as children and elderly people, cyclists and pedestrians”

In the Department of Communications, Climate Action & Environment document *Cleaning Our Air – Public Consultation to Inform the Development of a National Clean Air Strategy* vehicle emissions are included as a key source of health impacts in Ireland (DOCCA&E, 2017).

An assessment of the additional traffic movements associated with the Proposed Development during the construction and operational phases is presented in Chapter 12 (Traffic and Transportation).

The traffic assessment results can be seen in Table 12.3 of Chapter 12 which indicates that there would be an negligible increase in traffic associated with the operational phase of the development.

4.5.2.7 Potential Impacts from Major Accident Hazards and/or Natural Disasters on Population and Human Health

The Proposed Development has been designed with consideration given to the health and safety risks of people living and working in the vicinity. The facility has been designed by skilled personnel in accordance with internationally recognised standards, design codes, legislation, good practice and experience.

As outlined in Section 4.3.2 there is a negligible risk of external natural disasters; including landslides, seismic activity, volcanic activity and sea level rise. There is a negligible risk of major accidents to occur at the facility due to the lack of proximity to Seveso/Control of Major Accident Hazards (COMAH) Regulations sites.

As stated in Chapter 6 (Hydrology) and Section 4.3.2, the Proposed Development is in Flood Zone C. Therefore, this does not pose a risk to flooding. Therefore, the development is classified as appropriate for this flood zonation. There are no historic flood events recorded in the vicinity of the site and there is no record of pluvial flooding events within the site boundaries.

The potential effect is therefore **imperceptible**, and unlikely, respect of Major Accident Hazards or Natural Disasters on Population and Human Health Operational Phase of the Proposed Development.

4.6 REMEDIAL AND MITIGATION MEASURES

4.6.1 Construction Phase

The mitigation measures to address the potential impacts on population and human health from the Proposed Development have been assessed within the corresponding specialist chapters; Chapter 5 (Soils, Geology and Hydrogeology); Chapter 6 (Hydrology); Chapter 8 (Air Quality and Climate), Chapter 9 (Noise and Vibration); Chapter 10 (Landscape and Visual); Chapter 12 (Traffic and Transportation).

4.6.1.1 Businesses and Residences

There are no potential likely significant impacts on Businesses and Residences therefore additional measures are not required. Any impact will be further mitigated by the use of binding hours of construction as well as the measures set out in Chapter 5 (Soils, Geology and Hydrogeology); Chapter 6 (Hydrology); Chapter 8 (Air Quality and Climate), Chapter 9 (Noise and Vibration); Chapter 10 (Landscape and Visual); Chapter 12 (Traffic and Transportation).

The construction phase, therefore, is considered to have the potential to have an **imperceptible, temporary and positive** impact on the economy and employment of the local and wider area.

4.6.1.2 Landscape Amenity and Tourism

As described in Chapter 10 Landscape and Visual Impact, no significant visual effects were identified. However, a Landscape Plan is recommended to be prepared for the site which include measures for protection of hedgerows during construction. The implementation of the Landscape Plan would have significant benefits to (a) the site's biodiversity, by expanding, connecting and diversifying habitats, and (b) the occupants of nearby residential properties, by screening the buildings from view.

4.6.1.3 Land and Water Emissions

All mitigation measures outlined within the Chapter 5 and Chapter 6 will be implemented alongside a *Construction Environmental Management Plan (CEMP)*, as well as any additional measures required pursuant to planning conditions which may be imposed. The construction phase mitigation measures set out in the CEMP, these will be implemented by the construction Contractor to ensure that pollution and nuisances arising from site clearance and construction activities is prevented where possible and managed in accordance with best practice environmental protection. The mitigation measures detailed in Chapter 5 and Chapter 6 will address the main activities of potential impact which include:

- Control of soil excavation and export from site;

- Sources of fill and aggregates for the Proposed Development;
- Fuel and chemical handling, transport and storage; and
- Control of water during construction.

4.6.1.4 Air Emissions

Mitigation measures proposed to minimise the potential effects on human health in terms of air quality during the construction phase are set out in Chapter 8, Section 8.6.1. These include measures for dust control in relation to Site Management, Site Roads, Land Clearing, Storage Piles and Site traffic on Public Roads, to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to ensure that no dust nuisance occurs a series of measures drawing on will be implemented, drawing on best practice guidance from Ireland, the UK and the USA.

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed; and
- The specification of effective measures to deal with any complaints received.

4.6.1.5 Noise and Vibration Emissions

Mitigation measures proposed to minimise the potential effects on human health in terms of noise and vibration during the construction phase are set out in Chapter 9.

Mitigation measures will reference BS5228 Parts 1 and 2, which offer detailed guidance on the control of noise and vibration from demolition and construction activities. Once these are put in place, such as limiting the number of high-noise activities at the closest boundary to the properties, and best practice noise and vibration control measures will be employed by the contractor during the construction phase, the likelihood of a significant impact will be reduced sufficiently.

4.6.1.6 Traffic and Transportation

With reference to Chapter 12 (Traffic and Transportation) Section 12.6.1, a detailed Construction Environmental Management Plan (CEMP) has been prepared by AWN Consulting. The plan includes measures to minimise the impacts associated with the construction phase upon the peak periods on the surrounding road network.

All construction traffic is recommended to access and exit the site from the N11 Junction 21 with no HGV construction traffic permitted to travel through Arklow town.

HGV trips are anticipated to arrive and depart the site at a uniform rate throughout the day, to avoid pressure on the morning and evening peak hour periods.

The contractor will be required to designate an area within the confines of the site dedicated to operative car parking. There will be no parking permitted on the surrounding road network by the contractor or site operatives.

4.6.1.7 Major Accident Hazards and/or Natural Disasters

The potential effect is imperceptible, and unlikely, in respect of Major Accident Hazards or Natural Disasters on Population and Human Health during the Construction Phase of the Proposed Development. Therefore, no specific mitigation measures are required.

4.6.2 Operational Phase

The mitigation measures to address the potential impacts on population and human health from the Proposed Development have been assessed within the corresponding specialist chapters; Chapter 5 (Soils, Geology and Hydrogeology); Chapter 6 (Hydrology); Chapter 8 (Air Quality and Climate), Chapter 9 (Noise and Vibration); Chapter 10 (Landscape and Visual); Chapter 12 (Traffic and Transportation).

4.6.2.1 Businesses and Residences

There are no potential likely significant impacts on Businesses and Residences therefore additional measures are not required.

4.6.2.2 Amenity and Tourism

With reference to Chapter 10 (Landscape and Visual), there were no significant visual effects identified, and the proposal would contribute to the planned urbanisation of the Arklow southern environs, where an extensive expansion of the town is envisioned, with employment the predominant use. It is recommended that a Landscape Plan be prepared for the protection and enhancement of biodiversity. This would include;

- Proposals for supplementary planting to the perimeter hedgerows, to fill any gaps and maximise the habitat value and visual screening potential of the hedgerows;
- Proposals for the establishment and management of belts of woodland in the unused parts of the site around the buildings, particularly to the west, south and south east where there is potential for effective visual screening to reduce the effects on nearby residential properties;
- Proposals for the establishment and management of wildflower meadow in the remaining unused parts of the site, and in the green strips between the buildings;
- Measures to anticipate the demise of ash trees, including the felling and removal of affected specimens, and replanting of trees that will attain similar size without the risk of reinfection (i.e., beech, oak sycamore or lime).

The implementation of the Landscape Plan would have significant benefits to (a) the site's biodiversity, by expanding, connecting and diversifying habitats, and (b) the occupants of nearby residential properties, by screening the buildings from view.

4.6.2.3 Land and Water Emissions

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

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

The Proposed Development will provide a significant improvement to the local drainage catchment as it is proposed to provide full attenuation for increase in hardstand area in compliance with the requirements of the Greater Dublin Strategic Drainage Study. A number of measures will be put in place to minimise the likelihood of any spills entering the water environment to include the design of the car park, fitting of refuelling areas with hydrocarbon interceptors and on-site speed restrictions. It is proposed to collect runoff from the roofs and all hardstand areas using road gullies and a suitably sized network and discharge into the storm sewer previously granted under planning ref: 20/1088 which will run in the south western access road. Prior to discharging into this storm sewer in the access road, all run-off will pass through a petrol interceptor.

4.6.2.4 Air Emissions

No mitigation is proposed for the operational phase of the Proposed Development as impacts to air quality or climate will be ***imperceptible***.

4.6.2.5 Noise and Vibration Emissions

As the operational noise impact associated with the Proposed Development is negligible, mitigation measures are not required.

4.6.2.6 Traffic and Transportation

With reference to Chapter 12 (Traffic and Transportation) Section 12.6.2, the subject site will be accessible to staff from the Kish Business Park internal road and spine road.

Due to the negligible increase in traffic associated with the operational phase of the development as shown in Table 12.3 of Chapter 12, there are no further mitigation measures required.

4.6.2.7 Major Accident Hazards and/or Natural Disasters

The potential effect is imperceptible, and unlikely, in respect of Major Accident Hazards or Natural Disasters on Population and Human Health during the Operational Phase of the Proposed Development. Therefore, no specific mitigation measures are required.

4.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

4.7.1 Construction Phase

4.7.1.1 Businesses and Residences

It is predicted that there will be a slight positive impact on local business activity during the construction phase with the increased presence of construction workers using local facilities. This job creation will result in a **positive**, local to regional, **imperceptible, short-term** socioeconomic impact.

The presence of these site personnel in the area during the construction phase will create a slight additional demand in the area for services, particularly for food from local shops, restaurants and cafés. There will also be economic benefits for providers of construction materials and other supporting services, e.g., quarries. This is predicted to result in a positive, local to regional, indirect, not-significant, short-term socioeconomic impact.

Overall the construction phase is considered to have the potential to have an **imperceptible, temporary and neutral** impact on local businesses and residences. The residual impacts on local businesses and residences in relation to air quality, noise, visual impact, and traffic has been summarised in the below sections.

4.7.1.2 Landscape Amenity and Tourism

With reference to Chapter 10 (Landscape and Visual), implementation of the Landscape Plan would meaningfully reduce the negative visual effects on the small number of affected residential properties around the site. The planting would also have significant biodiversity benefits. The proposed substation and underground line in terms of both landscape and visual effects, is **neutral, slight and permanent**.

4.7.1.3 Land and Water Emissions

The implementation of mitigation measures outlined in Section 5.6.1 will ensure that the potential impacts on the geological and hydrogeological environment do not occur during the construction phase and that the residual effect will be **short-term-imperceptible-neutral**. Following the TII criteria for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

The implementation of mitigation measures highlighted in Section 6.5.4 will ensure that the potential impacts on the surface water environment do not occur during the construction phase and that the predicted impact will be **short-term, imperceptible, and neutral**.

4.7.1.4 Air Emissions

As detailed in Chapter 8 (Air Quality and Climate) Section 8.7.1, best practice mitigation measures are proposed for the construction phase of the Proposed Development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the Proposed Development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of

construction of the Proposed Development will be short term, direct, negative and imperceptible with respect to human health.

4.7.1.5 Noise and Vibration Emissions

During the construction phase of the Proposed Development there will be some impact on nearby noise sensitive properties due to noise emissions from site traffic and other activities. The application of noise limits and hours of operation (i.e. as per Table 9.4, along with implementation of appropriate noise and vibration control measures, as summarised in Section 9.6.1), will ensure that noise and vibration impact is kept to a minimum.

During periods where the works along the grid connection route are close to noise sensitive locations, the construction noise effects are expected to be negative, significant, but brief, as the works will progress along the route.

For the majority for the construction phase and activities, the noise effects are negative, slight and temporary.

4.7.1.6 Traffic and Transportation

Construction works for the substation will include site levelling works at the site, and these will largely be contained within the site. There will be materials required for the building works, and deliveries will spread throughout the working day. Construction operatives will travel to and from the site, but the anticipated timings of trips will largely be offset from the peak times on the local road network. Works for the ducting and cabling element will be carried out in a linear manner on the local links which will result in localised delays due to traffic management. Based on the assessment of the network links there will be insignificant effects on the receiving traffic and transportation environments. The residual effect of construction works will be **short term, insignificant and negative**.

4.7.1.7 Major Accident Hazards and/or Natural Disasters

There are no significant potential impacts on Human Health from Major Accident Hazards and/or Natural Disasters; therefore, there are no residual impacts.

4.7.2 Operational Phase

4.7.2.1 Businesses and Residences

The Proposed Development will result in an **imperceptible, positive** impact due to increased employment opportunities and improved accessibility to jobs in the area during the operation phases.

The predicted impacts on local businesses and residences in relation to air quality, noise, visual impact, and traffic has been summarised below.

4.7.2.2 Landscape, Amenity and Tourism

With reference to Chapter 10 (Landscape and Visual), while no significant negative landscape or visual effects have been predicted, and in the long term the effects will become neutral, it was recommended that a Landscape Plan be prepared for the site.

Implementation of the Landscape Plan would meaningfully reduce the negative visual effects on the small number of affected residential properties around the site. The planting would also have significant biodiversity benefits.

The buildings, associated engineering, roads, hardstanding and soft/hard landscape works have been designed to pre-emptively mitigate adverse effects on landscape character and sensitive visual receptors where possible, otherwise termed 'embedded mitigation', as assessed and identified above. Therefore, no mitigation measures other than those built into the proposal are proposed.

The proposed substation and underground line in terms of both landscape and visual effects, is **neutral, slight and permanent**.

4.7.2.3 Land and Water Emissions

The implementation of mitigation measures highlighted in Section 5.6 will ensure that the potential impacts on the geological and hydrogeological environment do not occur during the operational phase and that the residual effect will be **long-term-imperceptible-neutral**. Following the TII criteria (Appendix 6.1) for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

The implementation of mitigation measures highlighted in Section 6.6.3 will ensure that the potential impacts on the surface water environment do not occur during the operational phase and that the predicted impact will be **short-term, imperceptible and neutral**.

4.7.2.4 Air Emissions

Operational phase impacts associated with the Proposed Development are predicted to be long-term and imperceptible as the cables will be buried underground once constructed and there will be minimal emissions associated with maintenance vehicles accessing the substation site.

4.7.2.5 Noise and Vibration Emissions

As the operational noise impact associated with the Proposed Development is negligible, there are no residual noise or vibration impacts associated with the Proposed Development.

4.7.2.6 Traffic and Transportation

The Proposed Development will have an insignificant effect on the road network, in particular the road links in the proximity of the development. Overall the residual effect of the development will be **long term** in duration of **insignificant, neutral** effect.

4.7.2.7 Major Accident Hazards and/or Natural Disasters

There are no significant potential impacts on Human Health from Major Accident Hazards and/or Natural Disasters; therefore, there are no residual impacts.

4.8 CUMULATIVE IMPACT ASSESSMENT

The potential for cumulative impact of the Proposed Development with any/all relevant other planned or permitted developments as outlined in Chapter 2 (Description of

Proposed Development) are discussed in Sections 4.8.1 and 4.8.2 below for construction and operational phases.

The likely cumulative impact of the Proposed Development in conjunction with these cumulative developments upon health in relation to noise, dust generation, construction traffic, visual impacts, etc., associated with the works; have been assessed in the respective EIA Report Chapters.

4.8.1 Construction Phase

The only simultaneous construction projects capable of combining with the Permitted Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. There is also the potential for the Proposed Development to combine with the construction phase of the Biofuel Facility proposed under WCC Reg. Ref. 21.677. Overall there will be no cumulative impact to surface water quality from the Proposed Development in combination with the Permitted ICT Facility, and the proposed Biofuel Facility, therefore, there will be no cumulative impact on the Surface Waterbody Status and minimal cumulative potential for change in the natural hydrogeological regime. With the implementation of mitigation measures to protect soil and water quality in compliance with legislative standards the residual cumulative effect on land, soils, geology and hydrogeology of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be **neutral, imperceptible, and temporary** in duration (due to the duration of the construction works of the Proposed Development and the proposed Biofuel Facility lasting no more than 12 months).

The only simultaneous construction projects capable of combining with the Proposed Development is the Permitted ICT Facility (WCC Reg. Ref. 20/1088). Additionally, there is the potential for the Proposed Development to combine with the construction phase of the Biofuel Facility proposed under WCC Reg. Ref. 21.677. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the Proposed Development, the Permitted ICT Facility and the permitted Biofuel Facility are deemed **short-term, direct, negative and imperceptible**. Due to the relatively small scale of the Proposed Development and the short-term construction stage significant cumulative impacts to climate are not predicted.

There is the potential for cumulative impacts between the Proposed Development, the Permitted ICT Facility and the Biofuel facility during a simultaneous construction phase. The noise effects at the closest noise-sensitive locations to the ICT and Biofuel sites remains to be negative, slight, and temporary, for a number of reasons;

- the smaller scale of the substation works in comparison with the ICT facilities;
- the additional distance from the houses at Ballynattin to the ICT facilities, in comparison with the substation, and
- any noise effects due to the construction route, will, for the majority of the time, be at houses which are at greater distances from the ICT Facility site.

It is anticipated that some site clearance works associated with the Permitted ICT development (ref 20/1088) will be carried out concurrently with the development works. Those site clearance works would generate less than the peak construction traffic volumes accounted for in the traffic assessment. These, combined with the Proposed Development would not be greater than the peak construction traffic for the ICT Facility. While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during a simultaneous construction phase; the effect is considered to be **neutral, imperceptible, and temporary** in duration (due to the

duration of the construction works of the Proposed Development and the proposed Biofuel Facility lasting no more than 12 months). With the implementation of mitigation measures set out in Section 12.6 the residual cumulative effect on traffic and transportation during the construction phase of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be **negative, imperceptible, and temporary** in duration.

In relation to the potential cumulative effects within the landscape and visual environment during the construction phases, those key engineering works which could result in cumulative impact if not adequately mitigated include:

- The 110kV Substation, including the Control Centre and customer compound, access and earthworks;
- The associated construction works of the proposed underground line;
- The associated construction works of the proposed pylons;
- Permitted ICT Facility WCC Reg. Ref. 20/1088
- Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

While there is the potential for cumulative impacts between the Proposed Development and the Permitted ICT Facility during a simultaneous construction phase, the effect is considered to be **neutral, imperceptible, and temporary** in duration (due to the duration of the construction works of the Proposed Development lasting no more than 12 months). While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during a simultaneous construction phase, the effect is considered to be **neutral, imperceptible, and temporary** in duration. The proposed cumulative effects during construction of the underground line in combination with the permitted ICT facility buildings development and Biofuel Facility, in terms of both landscape and visual effects, is **neutral, slight and temporary**.

It is anticipated that some site clearance works associated with the Permitted ICT development (ref 20/1088) will be carried out concurrently with the development works. Those site clearance works would generate less than the peak construction traffic volumes accounted for in the previous assessment. These, combined with the proposed development would not be greater than the peak construction traffic for the ICT Facility. While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during a simultaneous construction phase; the effect is considered to be neutral, imperceptible, and temporary in duration (due to the duration of the construction works of the Proposed Development and the proposed Biofuel Facility lasting no more than 12 months). With the implementation of mitigation measures set out in Section 12.6 the residual cumulative effect on traffic and transportation during the construction phase of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be neutral, imperceptible, and temporary in duration (due to the duration of the construction works of the Proposed Development lasting no more than 12 months).

4.8.2 Operational Phase

The only simultaneous projects capable of combining with the Permitted Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed Development to combine with the operational phase of the proposed Biofuel Facility under WCC Reg. Ref. 21.677. Cumulatively the Proposed Development, the Permitted ICT Facility, and the proposed Biofuel Facility could result in localised reduced recharge to ground. The aquifer underlying the site is a locally important aquifer which is moderately productive only in local zones. The Proposed Development and known other development have a relatively small footprint in

comparison to the underlying aquifer size. As such, the impact is considered to be Low. There is the potential for accidental releases from fuel storage/unloading at the Proposed Development, the Permitted ICT Facility and the Biofuel Facility which could contaminate groundwater or soil environments unless mitigated adequately. Localised accidental discharge of hydrocarbons could occur in storage vessels, car parking areas and along roads unless diverted to surface water drainage system with petrol interceptors. While there is the potential for cumulative impacts between the Proposed Development, the Permitted ICT Facility and the Biofuel facility during operation; the effect is considered to be **neutral, imperceptible, and long-term** in duration.

In relation to climate, there will be no direct operational CO₂ emissions associated with the Proposed Development. The Proposed Development will facilitate the development of the permitted ICT facility (WCC Reg. Ref. 20/1088). The indirect CO₂ emissions associated with the electricity to operate the ICT facility development were determined within the EIAR for the development and were found to be insignificant in relation to climate. Overall, the impact to air quality and climate as a result of the proposed cumulative development will be **negative, direct and long-term** ranging from imperceptible to slight.

There are no operational noise and/or vibration impacts associated with the Proposed Development, hence cumulative impacts do not arise in this instance.

The Proposed Development includes measures to integrate with the adjacent Permitted ICT Facility development which provides onsite cycle and pedestrian facilities to align the works with improvements for such facilities in the broader transportation environment. The development will have a cumulative impact on the broader transportation environment. Even accounting for background traffic growth, the development will not have a significant impact on the capacity of the local network. With the implementation of mitigation measures set out in Section 12.7 the residual cumulative effect on traffic and transportation during the operational phase of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be **negative, imperceptible, and long term** in.

In relation to the potential cumulative impacts landscape and visual environment from the operational stages, the following could result in a cumulative impact if not adequately

- The Permitted ICT Facility WCC Reg. Ref. 20/1088
- Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).
- The access road and earthworks.
- The proposed pylons.

While there is the potential for cumulative impacts between the Proposed Development and the Permitted ICT Facility during operation, the effect is considered to be **neutral, imperceptible, and long-term** in duration. While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during operation, the effect is considered to be **neutral, imperceptible, and long term** in duration. The proposed steel latticework pylons are larger and taller than the existing adjacent double timber power poles. The additional existing structures are of a similar nature, however. While there is the potential for cumulative impacts between the Proposed Development the existing power infrastructure during operation, the effect is considered to be **negative, slight, and long-term** in duration.

In relation to the potential cumulative impacts on traffic and transportation from the operational stages, the proposed development will necessitate additional movements of vehicles on the local road network. The Proposed Development includes measures

integrated with the adjacent Permitted ICT Facility development which provides onsite cycle and pedestrian facilities to align the works with improvements for such facilities in the broader transportation environment. The development will have a cumulative impact on the broader transportation environment. Even accounting for background traffic growth, the development will not have a significant impact capacity of the local network. The potential combining of the operational traffic associated with the developments together would only result in a small increase on the surrounding network. With the implementation of mitigation measures set out in the EIAR for the permitted ICT facility the residual cumulative effect on traffic and transportation during the operational phase of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be **neutral**, **imperceptible**, and **long term** in duration.

4.9 REFERENCES

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

Environment Protection Agency, *Advice Notes for Preparing Environmental Impact Statements Draft* (EPA, 2015)

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

Central Statistics Office. Statbank Databases (Accessed January 2022, <https://www.cso.ie/en/databases/>)

Central Statistics Office. Census of Population, 2011 and 2016. (Accessed January 2022, <https://www.cso.ie/en/census/>)

Central Statistics Office. Labour Force Survey, 2020 (Accessed January 2022, www.cso.ie/en/statistics/labourmarket/labourforcesurvey/ifs)

Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC, Directive 2012/18/EU)

5.0 LAND, SOILS, GEOLOGY AND HYDROGEOLOGY

5.1 INTRODUCTION

This chapter of the EIAR has been prepared by AWN Consulting Ltd. which assesses and evaluates the likely significant impacts of the Proposed Development on the land, soil, geological and hydrogeological aspects of the site and surrounding area. In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

A description of the Proposed Development is provided in Chapter 2 (Description of the Proposed Development). Particulars of the Proposed Development are reiterated herein only insofar as they relate to the assessment of potential impacts on surface water in the receiving environment.

5.2 METHODOLOGY

5.2.1 Guidance and criteria for rating of effects

This assessment includes a review of the existing environment, the potential impacts of the Proposed Development, mitigation measures, and the potential impacts. The Assessment has been carried out generally in accordance with the following guidelines:

- Environment Protection Agency, *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (2022)
- European Union, *Guidance on the preparation of the Environmental Impact Assessment Reports* (2017)
- Institute of Geologists of Ireland (IGI) *Guidelines for the preparation of Soils Geology and Hydrogeology Chapters of Environmental Impact Statements* (2013); and
- National Roads Authority (NRA) *Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (2009).

In the EIA assessment, consideration is given to both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed activities on that attribute.

The Transport Infrastructure Ireland (TII) (formerly National Roads Authority) criteria¹ is used for estimating the importance of the soil, geology and hydrogeological attribute (Table 1 in Appendix 5.1).

The magnitude of the potential environmental impacts effects on the land, soil, geological and hydrogeological environment is based on the TII matrix presented in Table 2 in Appendix 5.1 and the quality, significance and duration of potential impacts

¹ National Roads Authority (NRA) *Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (2009).

are described in this chapter in accordance with the criteria provided in Table 1.2 of Chapter 1 (Introduction).

In assessing likely potential and predicted impacts, account has been taken of both the importance of the attributes and the predicted scale and duration of the likely impacts. Where an impact is identified, planned mitigation measures are identified and assessed.

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

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

5.2.2 Sources of Information

Desk-based geological information on the substrata (both quaternary deposits and bedrock geology) underlying the extent of the site was obtained through accessing national databases and site archives. The collection of baseline regional data was undertaken by reviewing the following sources:

- Geological Survey of Ireland (GSI) - on-line mapping, Geo-hazard Database, Geological Heritage Sites & Sites of Special Scientific Interest, Bedrock Memoirs and 1:100,000 mapping;
- Teagasc soil and subsoil database;
- Ordnance Survey Ireland - aerial photographs and historical mapping;
- Environmental Protection Agency (EPA) – website mapping and database information;
- National Parks and Wildlife Services (NPWS) – Protected Site Register; and
- Wicklow County Council(s) - illegal landfill information;

Site specific data was derived from a site walkover and the following sources:

- Information from the site investigations, completed by Ground Investigations Ireland (GII) 2020;

- Consultation with the project engineer;
- Proposed site plans and drawings;
- Foul & Surface Water Calculations & Details (October, 2022), completed by Alan Traynor Consulting Engineers Ltd.
 - AECOM Infrastructure Report 2020, submitted with the Permitted ICT Facility

5.3 RECEIVING ENVIRONMENT

5.3.1 Site Description

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

The Proposed Development site c. 8.68 ha is located on predominantly agricultural land and is located in the townlands of Kish and Boglands, to the south of Arklow, County Wicklow. The subject lands are bounded to the West and North by mainly greenfield agricultural lands, to the north-east by Arklow town, to the East by the Dublin-Wexford rail line and to the south by mainly greenfield agricultural lands and some residential dwellings. IDA Business Park is also located within the central section of the Proposed Development site.

Currently the landscape of the receiving environment is peri-urban in character. It incorporates some remaining agricultural use (in the form of large grassland fields divided by hedgerows), several clusters of rural housing along the Clogga Road, and a cluster of warehousing/factory type buildings at the Kish Business Park adjacent to the site. The sensitivity of the landscape to the Proposed Development is not high. The site itself would be fundamentally altered, with the removal of the grassland fields and internal hedgerows to accommodate the industrial-scale buildings and ancillary infrastructure. However, at the wider scale (the 'landscape scale') the development would be in keeping with the plan-driven trend of change towards an urban area dominated by employment uses.

There are no potential for impacts on recorded archaeological, architectural or cultural heritage sites associated with the Proposed Development. There are no recorded sites of architectural heritage value listed in the National Inventory of Architectural Heritage for the county, or in the Register of Protected Structures. However, a late 19th / early 20th century farmhouse, outbuildings and gardens survive in ruins on the site.

A detailed site description of the site and context can be found in Chapter 2 (Description of development) and Chapter 3 (Planning and Development Context).

Figure 5.1 presents the site location and surrounding land uses in context of the Proposed Development.



Figure 5.1 Site Location and Surrounding Land Use (source: Google Earth Pro, 2022)

5.3.1.1 Topography and Setting

A search of the surrounding area for EPA Licenced sites shows that there is one active Industrial Emissions (IE) licensed facility, and one Integrated Pollution Control (IPC) facility and one EPA licensed waste facility in the vicinity of the site (EPA, 2022); as described in Chapter 2 (Descriptions of Proposed Development).

The majority of the Proposed Development site has historically been used for agriculture and there is no evidence of soil or groundwater contamination based on previous site use, site investigation and soil quality assessment. The site is drained by a series of land drains which discharge beneath the Dublin- Rosslare railway at two locations to the Moneylane stream c. 0.91 km downgradient of the site. One of the land drains is named the Springfield stream on EPA mapping. The Moneylane stream joins the Avoca c. 2.3 km further downgradient (north) and ultimately this discharges to the Irish sea at Britttas Bay.

Currently the landscape of the receiving environment is peri-urban in character. It incorporates some remaining agricultural use (in the form of large grassland fields divided by hedgerows), several clusters of rural housing along the Clogga Road, and a cluster of warehousing/factory type buildings at the Kish Business Park adjacent to the site. The site itself would be fundamentally altered, with the removal of the grassland fields and internal hedgerows to accommodate the industrial-scale buildings and ancillary infrastructure of the Permitted ICT Facility.

The historic mapping below from c. 1837-1842 indicates the historic use and the present day aerial imagery – See Figures 5.2-5.3.

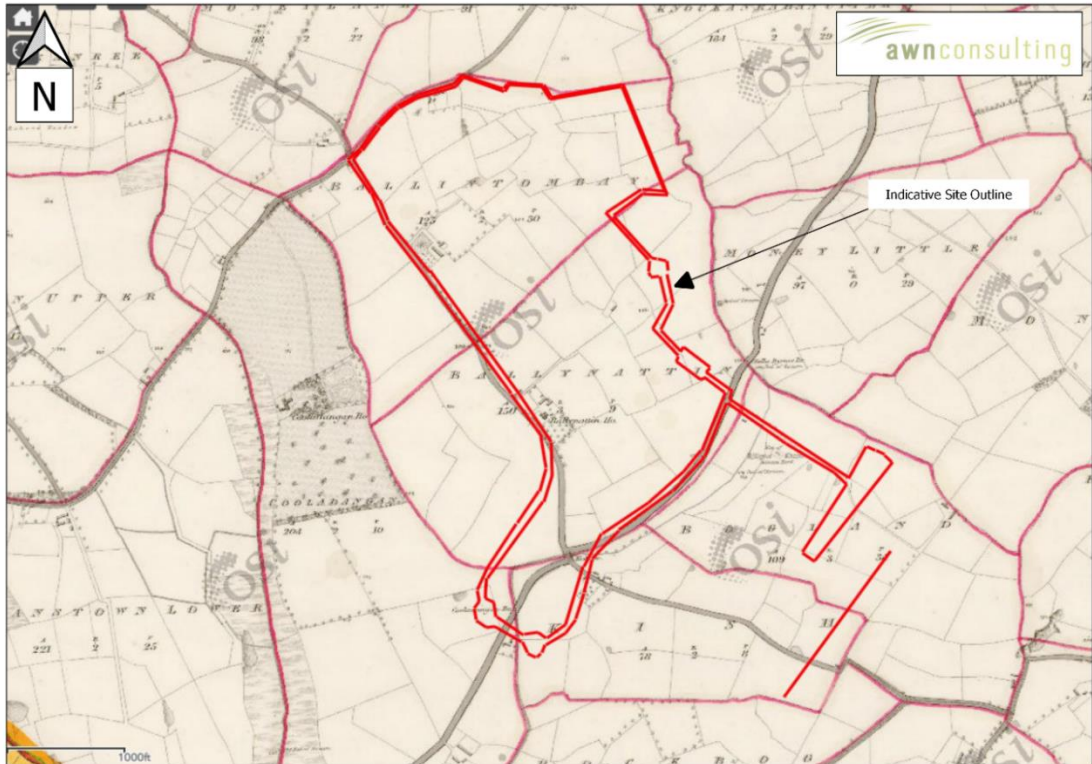


Figure 5.2 Historic Map 6 inch Colour (c. 1837-1842) (source www.osi.ie): showing the approximate site location highlighted in red.



Figure 5.3 OSi Aerial Map (2013-2018) (source www.osi.ie): showing the approximate site location highlighted in red.

5.3.1.2 Geological Heritage

The GSI (2022) on-line mapping was reviewed to identify sites of geological heritage for the site and surrounding area. There are no recorded sites within the boundary of at the development site, or sites which could be considered suitable for protection.

The nearest geological heritage site is the Kilpatrick Sandhills (Site code WX026) and is described as a mature sand dune system which extends along 2 kilometres of coastline and is located on the coast c. 4.9 km south-east of the site.

In addition to the above, site c. 6.4 km North of the site is the Snugborough (Site Code WW054) the feature is an excellent example of a periglacial feature, formed in permafrost and the Goldmines River (Site code WW033) located c. 8.4 km to the North-west, this is the site of Wicklow's gold rush or 1798 when placer gold was discovered in the gravels.

The Proposed Development will not impact on these geological heritage features due to the significant distance from the development lands and the characteristics of these features.

5.3.1.3 Site drainage

The site is drained by existing drainage ditches which ultimately discharge into onsite and offsite watercourses (Springfield 10 & Moneylane 10). The current EPA watercourse mapping shows an existing stream called Springfield 10 located in the most eastern portion of the Proposed Development site adjacent to the proposed 110 kV Substation. However, this feature is not shown in any of the old aerial or mapping records provided within the GeoHive website. It has been determined that, this feature is likely a surface water drainage feature that has developed over time along the laneway in a roadside ditch (as seen in Figure 5.2), rather than a pre-existing natural watercourse.

The Moneylane 10 enters the Proposed Development site from the South before exiting the site where it merges with the Springfield 10 before flowing in a northerly direction on the opposite side of the Arklow Bypass. This is discussed further in Chapter 6 (Hydrology), and the Foul & Surface Water Calculations & Details included with the planning documentation.

The Springfield 10 flows in a westerly direction and enters the Moneylane 10 along the sites eastern boundary. The Moneylane 10 flows North before merging with the Ballyduff Stream c. 1.4km downstream. The Ballyduff Stream enters the River Avoca a further 2.2km downstream before eventually flowing into the southwestern Irish Sea at Ballybrittas Bay c. 8km downstream of the Proposed Development site.

The hydrological environment is presented in detail in Chapter 6 (Hydrology).

5.3.2 Regional Soils

The Teagasc soil mapping indicates that the soils are comprised primarily of sandstone and shale till (AminPD & AminSRPT). The soil mineral is composed primarily of poorly drained (mainly acidic) with the western area of the site experiencing Deep well drained mineral (mainly acidic). The EPA have classed this area as agricultural land used for pastoral farming and as non-irrigated arable land. The Teagasc soil map for the site is presented below as Figure 5.4.

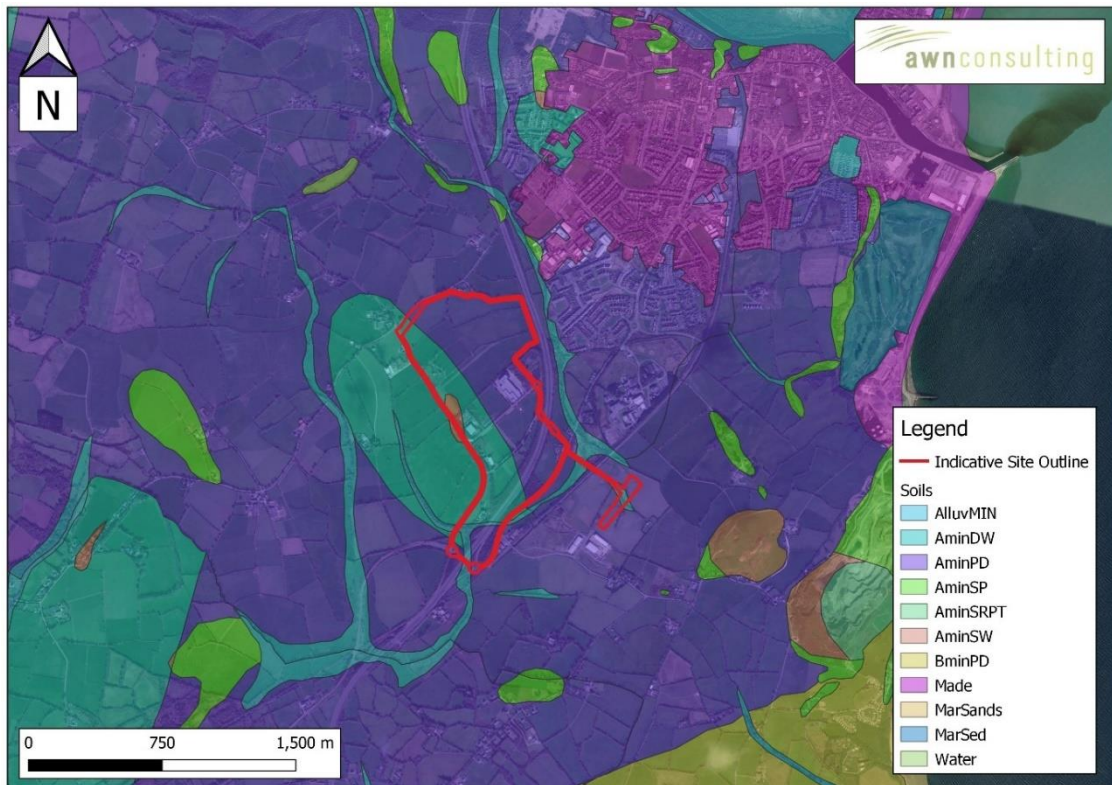


Figure 5.4 Soils Map (Source: Teagasc, 2022)

5.3.3 Subsoils (Quaternary)

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

The GSI/ Teagasc mapping database of the subsoils in the area of the subject site indicates one principal soil type, as shown in Figure 5.5. The subsoil type present across the site is:

- Irish Sea Till derived from Lower Palaeozoic sandstones and shales (IrSTLPSsS) with matrix of Irish Sea Basin origin present within small areas in the southern portions of the site.



Figure 5.5 Subsoils Map (Source: Teagasc, 2022)

5.3.3.1 Site Investigations

Site investigations were undertaken in January/February 2020 by Ground Investigations Ireland (GII) within adjacent lands to the immediate East of the development area for the Permitted ICT Facility. These investigations consisted of 12 No trial pits (Table 5.1) and 4 no. boreholes (Table 5.2) refer to Figure 5.6 for the location of these exploratory holes. The Appendix 5.3 and 5.4 to this report demonstrates provides the full GII report soil and water quality results).



Figure 5.6 Trial pit and borehole locations in context of the development site

Table 5.1 Site Investigation Trial Pits (source: GII, 2020)

SI Ref	Ground Level (mAOD)	Depth (below OD)	Depth (mBGL)
TP01	34.24	30.74	3.50
TP02	36.20	32.80	3.40
TP03	36.20	32.70	3.50
TP04	39.84	36.54	3.30
TP05	43.51	40.11	3.40
TP06	42.00	39.30	2.70
TP07	45.14	41.74	3.40
TP08	46.79	43.39	3.40
TP09	50.81	47.41	3.40
TP10	48.85	45.45	3.40
TP11	52.29	49.79	2.50
TP12	51.79	48.39	3.40

Table 5.2 Borehole investigations points (source: GII, 2020)

SI Ref	Ground Level (mAOD)	Depth (below OD)	Depth (mBGL)
RB01	33.93	19.53	14.40
RB02	45.64	33.04	12.60
RB03	40.73	26.93	13.80
RB04	53.66	41.36	12.30

A summary of the trial investigation logs show the site vertical profile is as follows:

- 0 – 0.3 m Topsoil
- 0.3 – 0.9 m Firm to stiff light orangey brown grey black mottled slightly sandy slightly gravelly CLAY.

- 0.9 - 1.2 m Stiff brown slightly sandy slightly gravelly CLAY with occasional angular to sub-angular cobbles.
- 1.2 – 3.5 Stiff to very stiff brown grey slightly sandy slightly gravelly CLAY.

Some of the trial pits encountered layers of silt at variable depths (from 2.0-3.0m to the final trial pit depth), mainly to the east of the site (TP07, TP08, TP09, TP10 & TP12). Gravel lens were observed in the centre of the site (TP06 & TP10).

Some of the trial pits encountered shallow perched groundwater. A summary of these trial pits are as follows:

- TP02: Slow ingress of groundwater encountered at 1.5m BGL;
- TP06: Fast ingress of groundwater at 0.8m BGL;
- TP10: Slow ingress of groundwater encountered at 2.0m BGL; and
- TP12: Slow ingress of groundwater encountered between 1.60m and 1.90m BGL.

In relation to boreholes, none encountered competent bedrock (up to 14.4 m deep). The overburden was described as stiff Clay. The exception was the borehole RB1, which encountered a layer of weak foliated weathered Slate below the clay at 10.3 mbgl and was completed at a depth of 14.4 mbgl.

There are no legislative threshold values for soils in Ireland. As such representative samples were compared with Waste Acceptance Criteria (WAC) and UK soil criteria based on land use. The WAC data provides assessment for suitability for disposal to landfill based on design of the landfill i.e. inert, Stable Non-reactive Hazardous Waste and Hazardous Waste Landfill. All samples were found to be below inert waste landfill criteria limits, (Appendix 6.3).

Soil samples were also compared to Generic Assessment Criteria (GAC) derived by the LQM (Land Quality Management) and the CIEH (Chartered Institute of Environmental Health) guidelines published in July 2009. This was updated in 2015 following further research and the results are now referred to as LQM/CIEH Suitable 4 Use Level (S4UL). The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and derive trigger values above which further assessment of the risks or remedial action may be needed.

For each contaminant S4ULs have been developed for six land use situations based on assessing exposure pathways in each planning scenario. In this instance the residential scenario has been considered. Soil type and soil organic matter (SOM) has an influence on the behaviour of contaminants hence the use of three SOM percentages (1%, 2.5% and 6%), to cover the likely range in soils, have been included in the S4UL's. A prudent approach has been taken by considering the lower 1% SOM content.

The UK values do not have any legal standing within the Republic of Ireland and no statutory guidance for assessing the significance of soil contamination currently exists. However, the values do provide a means of placing the data within context when considering magnitude of risk to human health and the environment and have been used in that capacity for this assessment. The main basis of the assessment remains the conceptual site model and consideration of the pollutant pathways to the surrounding waterbodies.

In general terms, the results of the soil quality analysis found no exceedances of the relevant thresholds for any of the parameters considered in the LQM/CIEH Suitable 4

Use Level (S4UL) guidelines for commercial (most conservative scenario) (refer to Appendix 6.3).

The WAC results from three trial pits at the site showed the soil was inert, and the LQMs were not exceeded, therefore soil taken from the site is safe for disposal at appropriate waste facilities. As the LQM results were not exceeded the site is safe for development if the soil was to be reused on site. The data can be found in Appendix 6.4. No indications of contamination were recorded during the site investigation works.

5.3.4 Regional Geology

Inspection of the available GSI (2022) records (Data Sheet 16 and on-line mapping database) shows that the site is underlain by the Kilmacrea formation (Llandeilo-Caradoc Stage, Rock Unit code: OCKILM). This geological formation comprises primarily of buff-weathering grey and black slates and shales, with occasional sandstones. There are some tuffaceous horizons, and distinction between shale-rich parts of volcanic formations and tuff-rich parts - See **Figure 5.7** below.

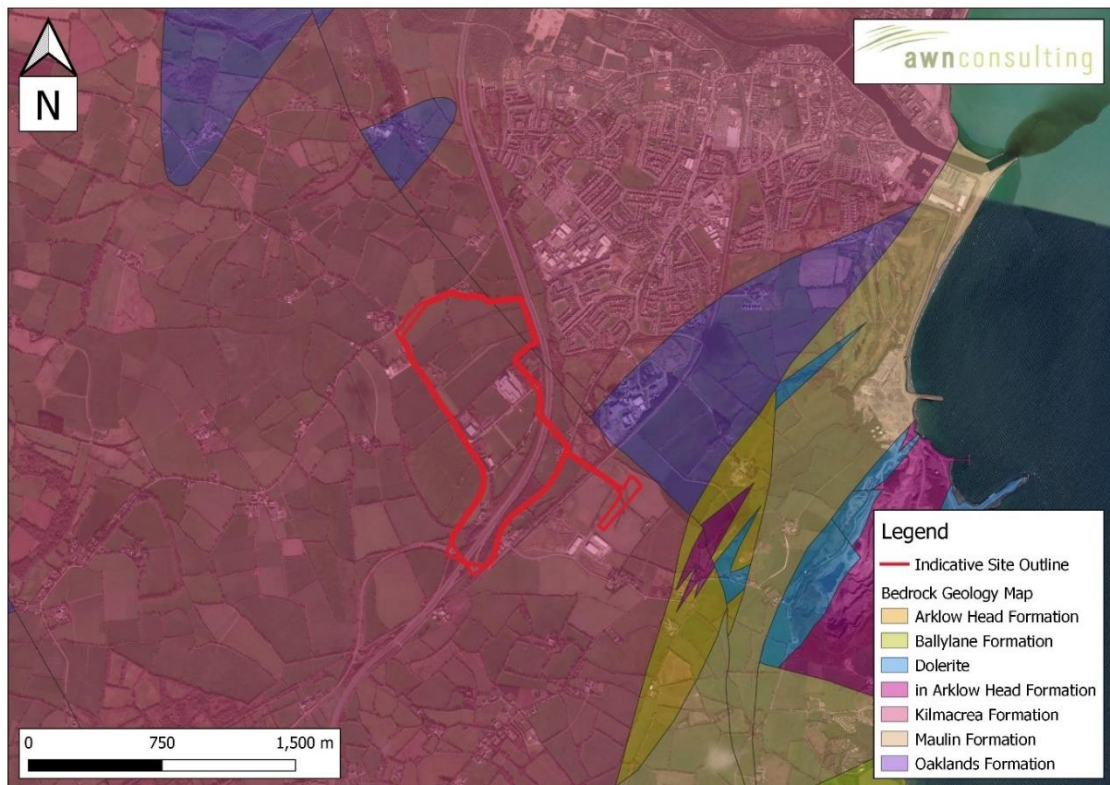


Figure 5.7 Bedrock Geology Map (source: GS1, 2022)

5.3.5 Regional Hydrogeology

5.3.5.1 Aquifer Classification

The GSI has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the area extent of the aquifer (km^2), well yield (m^3/d), specific capacity ($\text{m}^3/\text{d}/\text{m}$) and groundwater transmissivity (mm^3/d). There are three main classifications: regionally important, locally important and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow

regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are subdivided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (LI). Similarly, poor aquifers are classed as either generally unproductive except for local zones (PI) or generally unproductive (Pu).

The GSI (2018) classifies the principal aquifer types in Ireland as:

Bedrock Aquifer

- Rkc – Regionally Important Aquifer – Karstified (conduit)
- Rkd – Regionally Important Aquifer – Karstified (diffuse)
- RK – Regionally Important Aquifer – Karstified
- Rf – Regionally Important Aquifer – Fissured bedrock
- Lm – Locally Important Aquifer – Bedrock which is Generally Moderately Productive
- Lk – Locally Important Aquifer – Karstified
- LI – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones
- PI – Poor Aquifer – Bedrock which is Generally Unproductive except for Local Zones
- PU – Poor Aquifer – Bedrock which is Generally Unproductive

Gravel Aquifer

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

The bedrock aquifers underlying the Proposed Development site according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map is classified as a Locally Important Bedrock Aquifer (LI), which is described by the GSI as bedrock as 'moderately productive only in local zones.' – See Figure 5.8.



Figure 5.8 Aquifer Classification Map (source: GSI, 2022)

5.3.5.2 Aquifer Vulnerability

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

The GSI (2022) online mapping shows the site crosses three groundwater vulnerability categories. The western boundary of the site experiences a High (H) Vulnerability, the south-western and south-eastern areas of the site experience Low (L) vulnerability and the majority of the site is classified with a “Moderate” vulnerability status – See Figure 5.9.

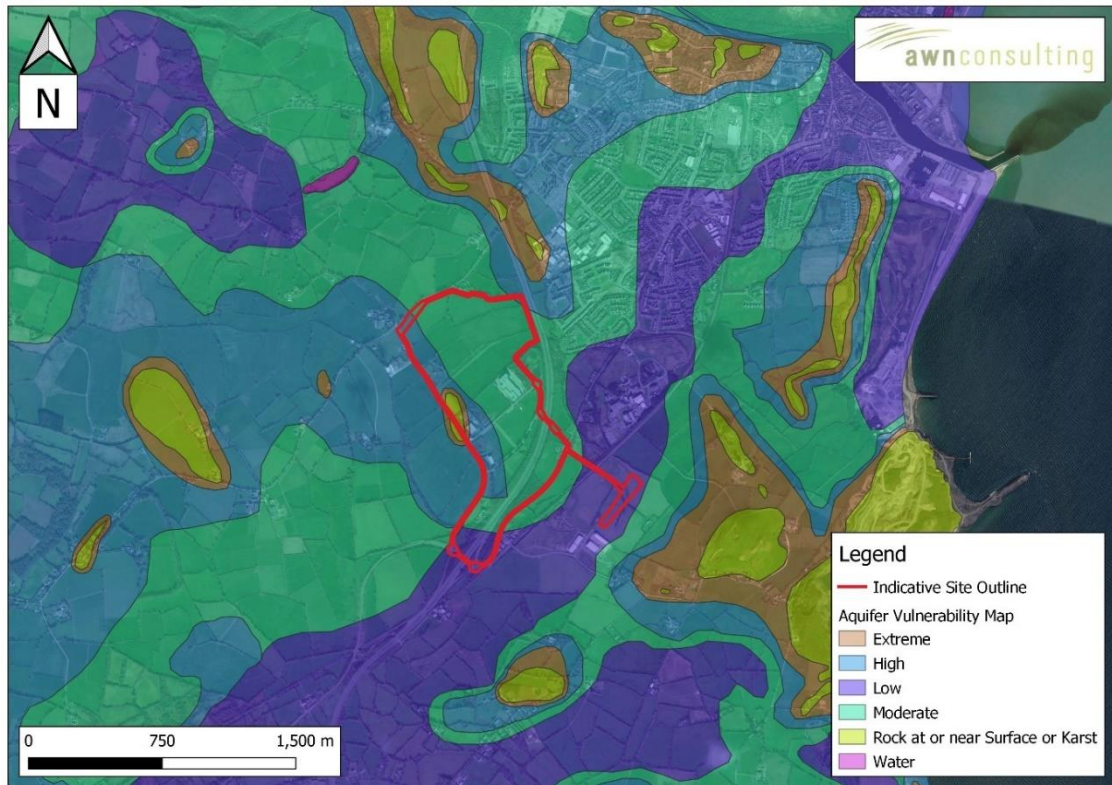


Figure 5.9 Aquifer Vulnerability Map (Source: GSI, 2021)

As can be seen from the table 5.3 below a Moderate (M) vulnerability with sandy subsoil denotes a depth to bedrock of >10mbgl.

The ground investigations carried out by Ground Investigations Ireland in the East of the site did not encounter competent bedrock in any of the boreholes (<14.4mbgl) with the exception of borehole RB1, which encountered a layer of weak foliated weathered Slate below the clay at 10.3mbgl and was completed at a depth of 14.4mbgl.

Table 5.3 Vulnerability Mapping Guidelines (source: GSI, 2022)

Vulnerability Rating	Hydrogeological Conditions				
	Subsoil Permeability (Type) and Thickness			Unsaturated Zone	Karst Features
	High permeability (sand/gravel)	Moderate permeability (e.g. Sandy subsoil)	Low permeability (e.g. Clayey subsoil, clay, peat)	(Sand/gravel aquifers only)	(<30 m radius)
Extreme (E)	0 - 3.0m	0 - 3.0m	0 - 3.0m	0 - 3.0m	-
High (H)	> 3.0m	3.0 - 10.0m	3.0 - 5.0m	> 3.0m	N/A
Moderate (M)	N/A	> 10.0m	5.0 - 10.0m	N/A	N/A
Low (L)	N/A	N/A	> 10.0m	N/A	N/A

Notes: (1) N/A = not applicable.
 (2) Precise permeability values cannot be given at present.
 (3) Release point of contaminants is assumed to be 1-2 m below ground surface.

The site investigations carried out by GII in January/February 2020 have been summarised in Table 5.1 and 5.2. These investigation works constructed exploratory holes through no. 12 trial pits to a depth 3.5 m, and 4 no. rotary core boreholes up to

14.4m deep. None of these boreholes/trial pits encountered competent rock (with the exception of RB01, which encountered weak foliated weathered Slate at 10.3mbgl). Therefore, given the close proximity of this site investigation to the Proposed Development site it is likely that the actual vulnerability of the site could be considered as 'Low'.

5.3.5.3 Groundwater Wells

There is no licencing system for wells in Ireland at present and as such no complete data set. The GSI Well Card Index is a record of wells drilled in Ireland, kept by the Geological Survey of Ireland. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in ROI. This current index, however, indicates there are 66 groundwater wells within a 2km radius of the development site. There is limited public water supply in the area, so it is possible that some of these wells are for domestic use. Known well locations are shown below on Figure 5.10 below and details are shown in Appendix 5.2.

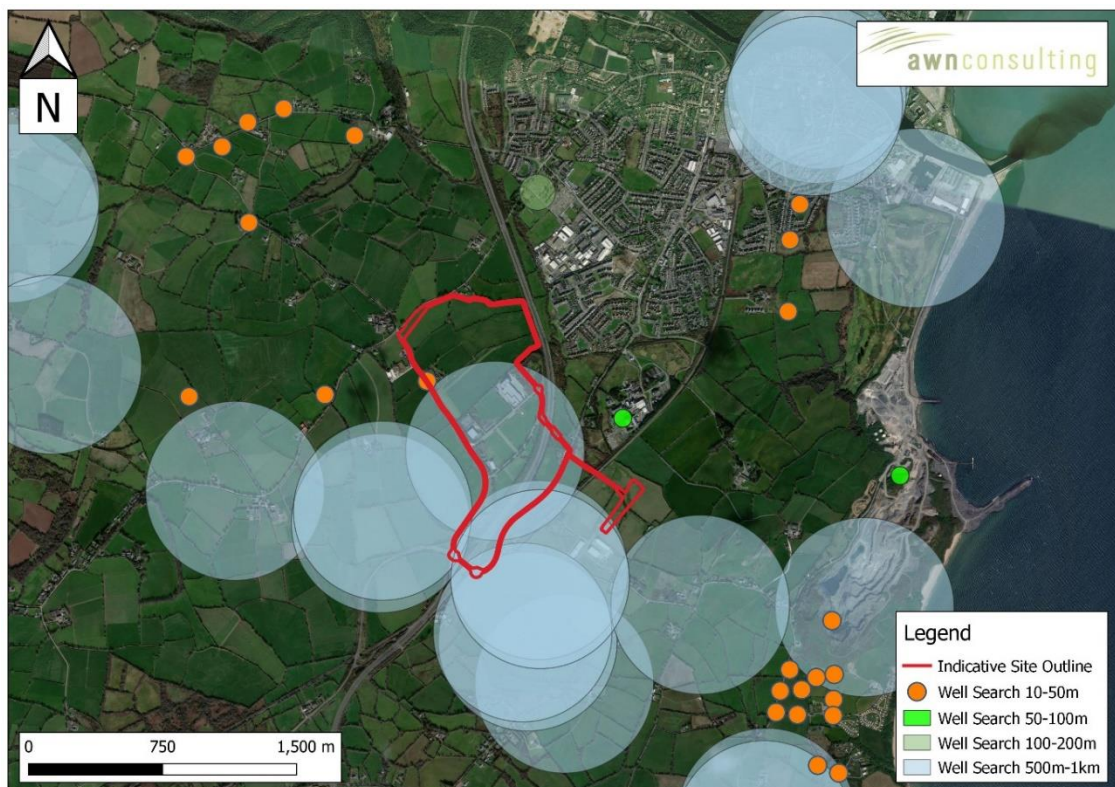


Figure 5.10 GSI Well Search Map (Source: GSI, 2021)

Table 5.4 The closest known abstraction wells (source: GSI, 2022)

GSI name	Well type	Well use	Depth	Drill date	Yield class	Yield (m3d)
3217SWW018	Borehole	Domestic use only	13.7	May 1, 1970	Poor	38
3217SWW055	Borehole		34.4	May 1, 1970	Moderate	55
3217SWW028	Borehole		22.5	October 1, 1969	Poor	38

5.3.5.4 Source Protection Areas

The source of the Arklow PWS is 13 boreholes in the Avoca River Basin. Currently, 3 of the boreholes located in Woodenbridge are used to supply water. The Goldmine River is not in use at present as the boreholes are insufficient to supply the required

demand as the unaccounted for water in the Arklow supply has been significantly reduced. Irish Water does not foresee using the Goldmine River in the short to medium term and is unlikely to use it unless the demand on the supply increases (DW2008/431, 31st August 2016, EPA, Drinking water audit report).

5.3.5.5 Groundwater Quality

The Water Framework Directive (WFD) 2000/60/EC, was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater and transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of 'Good Status' in water bodies that are of lesser status at present and retaining 'Good Status' or better where such status exists at present. 'Good Status' was to be achieved in all waters by 2015, as well as maintaining 'high status' where the status already exists. The EPA co-ordinates the activities of the ERBDs, local authorities and state agencies in implementing the directive, and operates a groundwater quality monitoring programme undertaking surveys and studies across the Republic of Ireland.

Presently, the groundwater body in the region of the site (Wicklow GWB) is classified under the WFD Risk Score system (EPA, 2022) as 'Good Status' and its risk is under review at present.

Site investigations by Ground Investigations Ireland (GII) show that results from four boreholes located at the development site for February 2020. These results were compared to Statutory Instruments European communities environmental objectives (groundwater) regulations (SI366 of 2016). The results showed no exceedance in groundwater quality for any of the four boreholes apart from slight exceedances in Dissolved Manganese for RB01 and RB02 (refer to Figure 5.10 and Appendix 5.3).

5.3.5.6 Hydrogeological Features

There is no evidence of springs or karstification at the vicinity of the site according to the GSI Karst and well database.

5.3.6 Economic Geology

The EPA Extractive Industry Register and the GSI mineral database were consulted to determine whether there are any mineral sites close to the subject site.

There is one active quarry c. 0.9 km East of the Proposed Development site operated by Roadstone Ltd. The Arklow (Parnell) Quarry is located in Rock Big. The processing which happens at the quarry includes excavator, blasting, crushing, grading, fixed plant and mobile plant. One mineral resource site was identified at Rock Little c. 0.5 km to the East of the site. The site is described as a quarry which contains granite, used locally. There will be no impact to mineral resources in the area as a result of the Proposed Development.

5.3.7 Radon

According to the EPA online maps (now incorporating the Radiological Protection Institute of Ireland) the site is located in an area between one and five per cent of the homes in the 10 km grid square which are estimated to be above the Reference Level (200 bq/m³).

5.3.8 Geo - Hazards

Much of the Earth's surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating the slope failure. Instability is often significantly increased by man's activities in building houses, roads, drainage and agricultural changes. Landslides, mud flows, bog bursts (in Ireland) and debris flows are a result. In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff landslides and falls lead to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities.

The GSI landslide database was consulted and there is one recorded landslide in the vicinity of the Proposed Development adjacent to the Dublin-Rosslare Railway Line. This event happened in 2009 (Event name: Bogland2009), a topple happened due to the railway embankment. This landslide caused no apparent impact. Due to this single event it can be assumed that the local topography and the underlying strata there is a negligible risk of a landslide event occurring at the site.

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

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

5.3.9 Areas of Conservation

There are no proposed Special Areas of Conservation (pSAC), Special Protection Areas (SPAs) or Natural Heritage area (NHA) within the study area boundary. According to the NPWS (2022) on-line database, the following area of conservation are located closest to the subject site (refer to Table 5.5 and Figure 5.11).

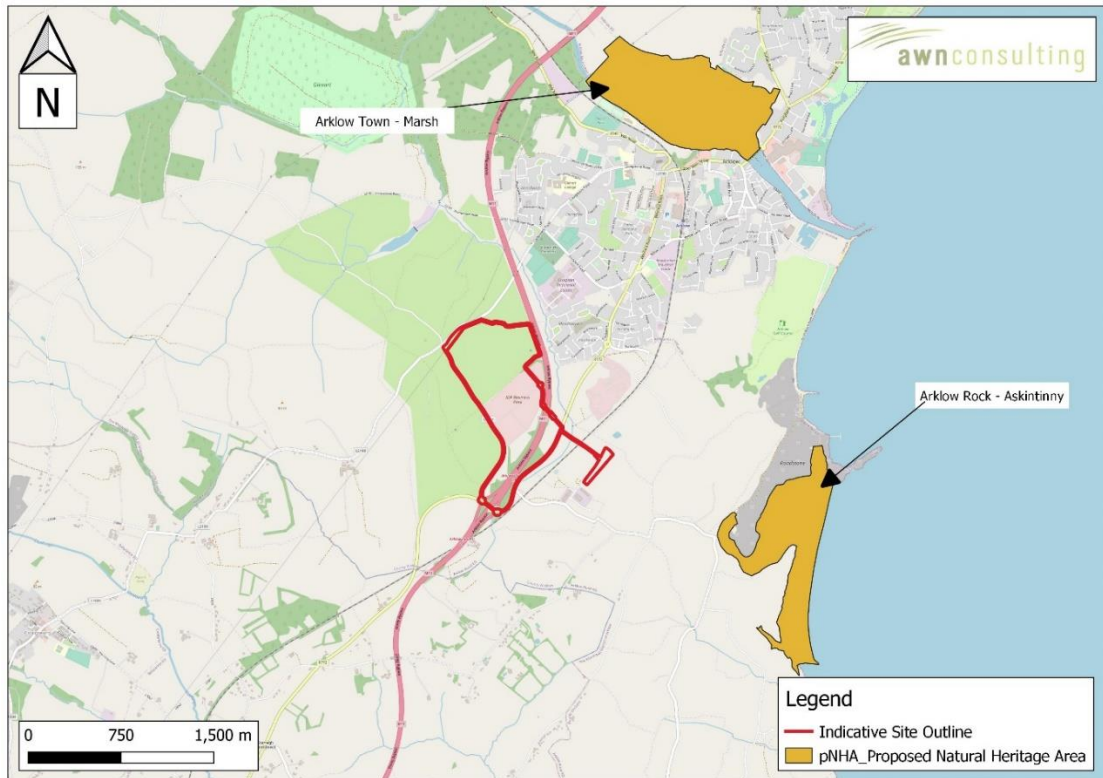


Figure 5.11 Conservation Areas in context of the Proposed Development site (Source: EPA, 2022)

Table 5.5 Details of European sites within the potential zone of impact of the project.

Site Code	Site Name	Distance (km) ²
001745	Arklow Rock Askintinny (pNHA)	1 (east)
001931	Arklow Town Marsh (pNHA)	1.8 (north)
001742	Kilpatrick Sandhills (SAC-pNHA)	4.9 (southeast)
000729	Buckronev – Brittas Dunes And Fen SAC	5.1km (northeast)

The nearest European site to the Proposed Development is the Arklow Rock Askintinny (Site Code 001745) 1km to the East. This is an area of exposed rock and associated habitat which will not be impacted by the Proposed Development. Drainage from site is towards the Moneylane which joins the River Avoca c. 4.3 km further downstream. The River Avoca discharges to the Avoca Estuary then into the Irish Sea – Brittas Bay 4.4 km downstream.

Potential adverse effects on these European sites from the Proposed Development are highly unlikely given the distance of removal. An Appropriate Assessment (AA) Screening Report was carried out as part of the EIAR for the adjacent ICT facility which concluded that there would be no likely significant effects on any European sites arising from the development of the site.

² Distances indicated are the closest geographical distance between the proposed Project and the European site boundary, as made available by the NPWS. Connectivity along hydrological pathways may be significantly greater.

5.3.10 Former Landfill

The environmental/waste team at Wicklow was contacted regarding landfills (authorised or unauthorised) within the vicinity of the development site. Detail was provided of a former Clogga landfill located to the east, outside the boundary of the Proposed Development site. The indicative landfill extent provided by WCC is shown in **Figure 5.12**. WCC noted that there is very little information available for landfill and that a risk assessment will be undertaken at some future date by WCC.

The site investigation carried out by Ground Investigations Ireland (GII) in the immediate adjacent lands East of the Proposed Development included exploratory trial pits and groundwater wells. Based on the soil and groundwater sample testing results there is no indication of buried waste or contamination in the eastern areas of the site. The SI works showed that the eastern side of the site there is at least c. 12 m of stiff clay which is a poor pathway for migration of any contamination from off site. In addition, the landfill is likely downgradient of the site in terms of regional groundwater flow.



Figure 5.12 Location of Former Clogga Road Landfill (source: GIS, 2022)

5.3.11 Conceptual Model

A local cross section for the development site is presented below as Figure 5.13 (A-A' northwest to southeast). These cross sections and the description below present the conceptual site model (CSM):

- Bedrock was not encountered in any of the trial pits (<3.5 mbgl) or the boreholes (<14.4 mbgl), overburden comprises stiff sandy gravelly Clay. Aquifer vulnerability is therefore Low following the GSI classification methodology.

- The GSI indicates that the site is underlain by Kilmacrea formation, which is composed of buff-weathering grey and black slates and shales, with occasional sandstones. Slate was encountered to the NE of the site at 10.3m deep (RB01).
- The bedrock aquifer is classified by the GSI as a Locally Important Bedrock Aquifer (LI), which is described as 'moderately productive only in local zones'.
- The groundwater body in the region of the site (Wicklow GWB) is classified under the WFD Risk Score system (EPA, 2022) as 'Good Status' and its risk is under review at present.
- A review of the OS mapping indicates that there are drains/watercourses in the vicinity of the site. This drains into the Springfield or Moneylane/ Ballyduff stream.
- There is no evidence of soil or groundwater contamination based on previous site use or site investigation.
- There are no groundwater dependent terrestrial ecosystems which have potential to be impacted by the Proposed Development.

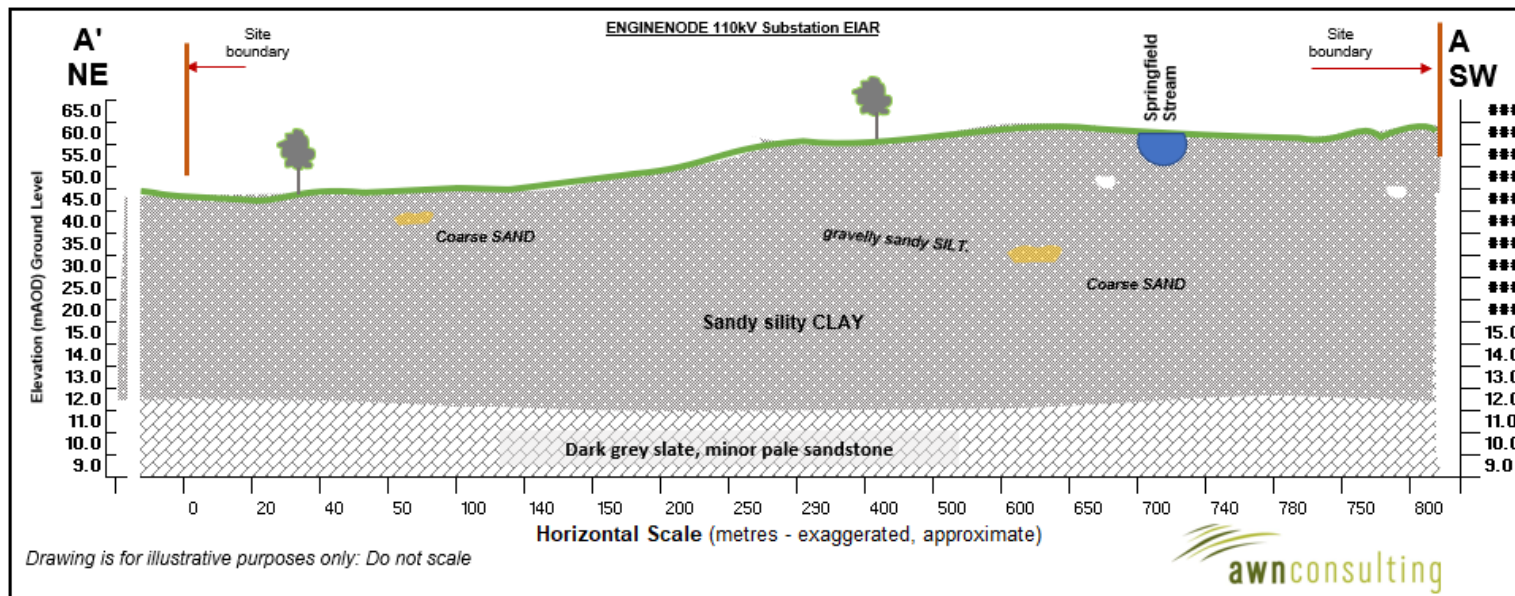


Figure 5.13 Cross Section A-A'



5.3.12 Rating of Site Importance of Geological/Hydrogeological Features

Based on the NRA methodology (2009) (refer to Appendix 6.1), criteria for rating site importance of geological features, the importance of the bedrock and soil features at this site is rated as 'Medium' importance with medium significance or value on a local scale, due to the presence of a quarry 0.6 km to the east of the site and the aquifer beneath the site is a Locally Important (LI) bedrock aquifer which is Moderately Productive. This aquifer includes a supply for Arklow town and surrounds.

5.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A detailed description of the Proposed Development and a site layout is presented in Chapter 2 (Description of Development) and the included planning documentation. The activities associated with the Proposed Development which are relevant to the land, soils, geology and hydrogeological environment are detailed in Table 5.6.

Table 5.6 Site Activities Summary

Phase	Activity	Description
Construction Phase	Earthworks: Excavation of materials above the water table	<p>Cut and fill will be required to facilitate construction, expansion of drainage network and ancillary works. Subsoil stripping and localised stockpiling of soil will be required for short periods of time during construction.</p> <p>The maximum depth of excavation required to facilitate installation of the development foundations and the terracing of the site is, is c. 6.5m below ground level. There will be no excavation of bedrock required as part of the Proposed Development.</p> <p>In addition to the transmission lines, it is estimated that approximately 3,860 m³ of topsoil and subsoils will be excavated for the substation, attenuation, and landscaping component of the Proposed Development. Suitable soils and stones will be reused on-site as backfill in the grassed areas, where possible. The 110 kV Substation site requires a net fill of 22,091 m³. The recontouring of the 110 kV Substation lands will be undertaken as part of the ICT Facility permitted under WCC Reg. Ref.: 201088. The permitted ICT Facility required a net export of soil / stones which will be reused on site for ground levelling. The Proposed Development will therefore utilise cut material from the ICT Facility site and will not require the importation of fill material.</p> <p>The 110 kV Substation and Control Room foundations are proposed to consist of a steel fiber reinforced concrete slab supported on 800 mm x 700 mm deep reinforced concrete beams. These beams are supported on 275 mm x 275 mm driven precast concrete piles. The depth of pile is anticipated to be in the order of c. 9 m below the FFL (subject to detailed design and further exploration of ground conditions) refer to Alan Traynor Consulting Engineers drawings 22-066-200, and 22-066-201 for further details.</p>
	Horizontal Directional Drilling	<p>Horizontal Directional Drilling (HDD) drilling is required for the installation of the two transmission cables (Circuit Route A & Circuit Route B).</p> <p>Circuit Route A', is a linear route of 2934 m; between the 110 kV Substation Site to the existing 110 kV overhead line located to the west. This route crosses the M11 motorway at Junction 21 following the R772, then traverses along the L6187, enters agricultural lands at Knockeneahan Road (L2190), and terminates at the existing 110 kV overhead line.</p> <p>Circuit Route B', is a linear route of 2216 m; between the 110 kV Substation Site to the existing 110 kV overhead line located to the west. The route crosses perpendicular to the Dublin-Rosslare rail line, R772, M11, then traverses an IDA Business Park, and open agricultural lands adjacent to the M11 and Knockeneahan Road (L2190) and terminates at the existing 110 kV overhead line.</p>

Phase	Activity	Description
	Storage of hazardous Material	Bunded fuel storage and use of wet concrete during construction phase.
	Import/Export of Materials	It is envisaged that all excavated material will be removed as a waste off site. Any material re-used offsite for beneficial use on other sites with appropriate planning/waste permissions/derogations (e.g. in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011) or will be recovered and/or disposed off-site at appropriately authorised waste facilities. The soil removed as part of the transmission lines will be tested prior to disposal. The removal of waste from the site will be carried out in accordance with Waste Regulations, Regional Waste Plan and Waste Hierarchy/Circular Economy Principals. Refer to Chapter 14 Waste Management for further detail. The importation of clean engineered fill will be required to facilitate construction. In the event of any soils/stones being imported onto the site from another construction site as a by-product, this will also be done in accordance with Article 27. (EPA agreement should be obtained before use of soils/stones as a by-product.)
	Storage of hazardous Material	Fuel for construction vehicles will be stored in the already approved contractors' compound at the development site during construction phase.
Operational Phase	Discharge to Ground	Run-off from construction areas percolating to ground with a potential for contamination as a result of any accidental leaks from construction traffic or fuel storage
	Discharge to Ground (wastewater)	Treated wastewater (package wastewater treatment system and a sand polishing filter) will be discharged to ground through a gravel bed filtration system.
	Increase in hard standing area	Altering of local recharge due to increase in hard standing area.
	Storage of hazardous Material	It is assumed that there will be no bulk storage of any chemicals during the operational phase of this development.

5.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

An analysis of the potential impacts of the Proposed Development on the land, soils, geology and hydrogeological environment during the construction and operation is outlined below. Due to the inter-relationship between soils, geology and hydrogeology and surface water (hydrology) the following impacts discussed will be considered applicable to both Chapter 5 and 6 of the EIA Report. Remediation and mitigation measures included in the design of this project to address these potential impacts are presented in Section 5.6.

There is no likely potential impact on any protected habitat based on the design criteria and distance of any hydrological or hydrogeological pathways.

5.5.1 Construction Phase

5.5.1.1 Earthworks and Excavation

Due to the lack of previous development at the site and the historical agricultural use at the site, the risk of contaminated soils being present onsite is low and this was confirmed by onsite soil sampling and analysis.

Nonetheless, excavation of soil, tarmac and hardcore will be required for the installation of the transmission line. Local removal and reinstatement (including infilling) of the 'protective' topsoil and subsoil cover across the development area at

the site will not change the overall vulnerability category for the site which is already 'high to extreme'. Capping of the substation footprint of the site by hardstand/ building following construction and installation of drainage which will minimise the potential for contamination of the aquifer beneath the site: The Locally Important Bedrock Aquifer (LI) which is moderately productive in local zones only.

The excavation of material along the 110 kV underground cable encompass removing material along roadways. It is assumed that the material removed along these roadways is expected to be contaminated. This material will be required to be removed and disposed by a licenced contractor to an appropriate waste facility.

Material that is exported from site, if not correctly managed or handled, could impact negatively on human beings (onsite and offsite) as well as water and soil environments.

5.5.1.2 Accidental Spill and Leaks

As with all construction projects there is potential for water (rainfall and/or groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a significant short-term risk to groundwater quality for the duration of the construction if contaminated water is allowed to percolate to the aquifer. During construction of the development, there is a risk of accidental pollution incidences from the following sources:

- Suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates)) – arising from excavation and ground disturbance;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage;

5.5.1.3 Loss of agricultural land

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

5.5.2 Operational Phase

5.5.2.1 Increase in Hardstand

There will be an increase in hardstand as a result of the Proposed Development of c. 0.412 ha. It is proposed to collect runoff from the roofs and all hardstand areas using road gullies and a suitably sized network and discharge into the Permitted ICT Facility storm sewer which will run in the south western access road. Prior to discharging into this storm sewer in the access road, all run-off will pass through a petrol interceptor. There is no requirement for additional attenuation measures as the attenuation basin granted under previous planning 20/1088 has been designed to accommodate all proposed run-off for the entire development.

The surface water network was designed as part of the permitted ICT facility (planning ref: 20/1088). The surface water design for the Proposed Development was designed to comply with the GSDS and the Sustainable Urban Drainage Systems (SuD's). The SuDs design will encourage discharge to ground where feasible using a network of swales, attenuation pond, filter drains and petrol interceptors.

The attenuation and drainage system are presented as part of the planning report Foul & Surface Water Calculations & Details and drawings prepared by Alan Traynor – Consulting Engineers Ltd. The report ‘Foul & Surface Water Calculations & Details’ prepared by Alan Traynor Consulting Engineers included with the planning documentation provides further details on surface water design. Accidental Spill and Leaks

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

In the event of a fire at the 110 kV substation facility, firewater could become contaminated and in the absence of mitigation may contaminate soil and groundwater.

5.5.2.2 On-site Wastewater Treatment

It is proposed to install a package wastewater treatment system and a sand polishing filter. The effluent first undergoes secondary treatment in a 3 – stage process within the treatment tank before being pumped to a 226 m² sand polishing filter which provides tertiary treatment before discharging to ground. The second stage involves biological treatment by use of aeration in the reactor chamber. Any remaining suspended solids then settle in the clarifier during the third stage. The solids are then transferred by airlift to the primary chamber to aid in denitrification.

Onsite wastewater will be discharged to a gravel bed percolation system for filtration before it percolates through the soil profile. Based on the GSI vulnerability maps and site investigations the overburden throughout the majority of the development site is over >15m. This overburden will filter out the pollutants before it reaches the groundwater sources underneath the development.

A site characterisation report has been completed by a Wicklow County Council approved assessor which shows that the proposed design is suitable for the site conditions and ensure protection of the underlying aquifer. Details of the proposed design are included in the Foul & Surface Water Calculations & Details completed by Alan Traynor Consulting Engineers Ltd, 2022.

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

These potential impacts are not anticipated to occur following the implementation of mitigation measures outlined in Section 5.6.

5.6 REMEDIAL AND MITIGATION MEASURES

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

5.6.1 Construction Phase

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

- Control of soil excavation and export from site;

- Sources of fill and aggregates for the Proposed Development;
- Fuel and chemical handling, transport and storage; and
- Control of water during construction.

Construction Environmental Management Plan (CEMP)

A Construction Environmental Management Plan (CEMP) has been prepared in respect of the proposed development by AWN (refer to Chapter 2 Description of the Proposed Development Appendix 2.1). It contains best practice measures and protocols to be implemented during the construction phase of the proposed development to avoid / minimise environmental impacts, including in relation to surface and groundwater.

To ensure the CEMP remains fit for purpose, it will be regarded as a live document. The appointed contractor will be responsible for updating the CEMP, as required; e.g. to reflect the publication of relevant new or revised guidelines and / or new statutory requirements. The full schedule of environmental commitments (i.e. all mitigation measures set out in the CEMP, Environmental Impact Assessment Report and Natura Impact Statement submitted as part of the planning application, as well as any applicable conditions of development consent) will be included in the CEMP by the appointed contractor.

The CEMP was formulated in accordance with best international practice including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, (C532) Construction Industry Research and Information Association;
- CIRIA (2002) Control of water pollution from construction sites: guidance for consultants and contractors (SPI56) Construction Industry Research and Information Association
- CIRIA (2005), Environmental Good Practice on Site (C650); Construction Industry Research and Information Association
- BPGCS005, Oil Storage Guidelines;
- Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites;
- CIRIA 697, The SUDS Manual, 2007; and
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004.

All contractors will be required to implement the CEMP.

Soil Excavation, Removal and Infill

The excavation will require excavation of topsoil stones and subsoil and a significant amount of infill to facilitate the Proposed Development.

Contractors should prepare and adhere to a method statement indicating the extent of the areas likely to be affected and demonstrating that this is the minimum disturbance necessary to achieve the required works.

Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated through the implementation of an appropriate earthworks handling protocol during construction.

Dust suppression measures (e.g. damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment are free of nuisance dust and dirt on roads.

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

Reuse of Material from Site

It is estimated that approximately 3,860 m³ of material will be excavated to facilitate construction of the proposed transmission lines. It is currently envisaged that majority of this excavated material will be reused onsite for increasing the elevation of the Proposed Development.

The 110 kV Substation site requires a net fill of 22,091 m³. The recontouring of the 110 kV Substation lands will be undertaken as part of the Permitted ICT Facility (WCC Reg. Ref.: 201088). The permitted ICT Facility required a net export of soil / stones. The Proposed Development will therefore utilise cut material from the permitted ICT Facility site and will not require the importation of fill material. Suitable soils and stones will be reused on-site as backfill in the grassed areas, where possible. It is currently envisaged that all of the excavated material will be reused on site, and will not require the importation of fill material.

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

Sources of Engineering Fill and Aggregates

All fill and aggregate for the Proposed Development will be sourced from reputable suppliers. All suppliers will be vetted for:

- Aggregate compliance certificates/declarations of conformity for the classes of material specified for the Proposed Development,
- Environmental Management status; and
- Regulatory and Legal Compliance status of the Company

Fuel and Chemical Handling

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

- Designation of a bunded refuelling areas on the site if refuelling cannot be undertaken off site;

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

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

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

Control of Water During Construction

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

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

Should any discharge of construction water be required during the construction phase, discharge will be to foul sewer. Run-off water containing silt will be contained on site via settlement tanks and treated to ensure adequate silt removal. Silt reduction measures on site will include a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds, 20m buffer zones between machinery and watercourses, the refuelling of machinery offsite and hydrocarbon interceptors).

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

Should any discharge of construction water be required during the construction phase, discharge will be as required by a permit from Irish Water/Local Authority. Any surface water run-off collecting in excavations will be pumped from the excavation and treated

prior to discharge. See Chapter 6 (Hydrology) for a full description of mitigation measures proposed.

5.6.2 Operational Phase

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

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

Increase in hardstand

A proportion of the development area will be covered in hardstand. This provides protection to the underlying aquifer but also reduces local recharge in this area of the aquifer. As the area of aquifer is large this reduction in local recharge will have no significant change in the natural hydrogeological regime. Surface water management and mitigation measure are discussed in Chapter 6 (Hydrology).

5.7 RESIDUAL EFFECTS OF THE PROPOSED DEVELOPMENT

This section describes the predicted impact of the Proposed Development following the implementation of the remedial and mitigation measures.

5.7.1 Construction phase

The implementation of mitigation measures outlined in Section 5.6 will ensure that the potential impacts on the geological and hydrogeological environment do not occur during the construction phase and that the residual effect will be **short-term-imperceptible-neutral**. Following the TII criteria for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

5.7.2 Operational phase

The implementation of mitigation measures highlighted in Section 5.6 will ensure that the potential impacts on the geological and hydrogeological environment do not occur during the operational phase and that the residual effect will be **long-term-imperceptible-neutral**. Following the TII criteria (Appendix 6.1) for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

5.8 CUMULATIVE IMPACTS OF THE DEVELOPMENT

The potential for cumulative impact (as far as practically possible) of the Proposed Development with any/all relevant planned, existing or permitted developments as set out in Chapter 2, Section 2.8 and 2.9 of the EIAR, unless otherwise stated. The

likelihood of cumulative effects are discussed in Sections 5.8.1 and 5.8.2 below for construction and operational phases.

5.8.1 Construction Phase

In relation to the potential cumulative impact on the geological or hydrogeological environment during the construction phases, those key engineering works which could result in cumulative impact if not adequately mitigated include:

- The removal of topsoil and subsoil cover during construction, which will further increase the vulnerability of the underlying bedrock. Capping of significant areas of the sites by hardstand/ buildings following construction and installation of drainage will minimise the potential for contamination of groundwater.
- Contamination of soils and groundwater underlying the site from accidental spillage and leakage from construction traffic and construction materials may occur unless project-specific mitigation measures implemented via the Construction Environmental Management Plan (CEMP) prepared by AWN, 2022, is put in place. A project-specific CEMP will be implemented for the Proposed Development.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified the only simultaneous construction projects capable of combining with the Permitted Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed Development to combine with the construction phase of the Biofuel Facility proposed under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

Permitted ICT Facility WCC Reg. Ref. 20/1088; is subject to the Environmental Impact Assessment Report and planning conditions which include appropriate mitigation measures to minimise environmental impacts. Furthermore, Condition 8 of WCC Reg. Ref. 20/1088 requires the works contractor to provide a detailed Construction Environmental Management Plan (CEMP) for the Permitted ICT Facility. The CEMP for the Permitted ICT Facility will ensure that this project will be managed in a safe and organised manner by the Contractor. While there is the potential for cumulative impacts between the Proposed Development and the Permitted ICT Facility during a simultaneous construction phase; the effect is considered to be **neutral**, **imperceptible**, and **temporary** in duration (due to the duration of the construction works of the Proposed Development lasting no more than 12 months).

The proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181 is similarly; subject to an Environmental Impact Assessment Report which includes appropriate mitigation measures to minimise environmental impacts. The proposed Biofuel Facility application included an outline Construction Management Plan (CMP). The CMP for the proposed Biofuel Facility will ensure that this project will be managed in a safe and organised manner by the Contractor. While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during a simultaneous construction phase; the effect is considered to be **neutral**, **imperceptible**, and **temporary** in duration (due to the duration of the construction works of the Proposed Development and the proposed Biofuel Facility lasting no more than 12 months).

AWN Consulting and the project team have prepared a *Construction & Environmental Management Plan (CEMP)* (2022) that will be adhered to in full. This outlines and explains the construction techniques and methodologies which will be implemented during construction of the Proposed Development.

Overall there will be no cumulative impact to surface water quality from the Proposed Development in combination with the Permitted ICT Facility, and the proposed Biofuel Facility, therefore, there will be no cumulative impact on the Surface Waterbody Status and minimal cumulative potential for change in the natural hydrogeological regime.

With the implementation of mitigation measures to protect soil and water quality in compliance with legislative standards the residual cumulative effect on land, soils, geology and hydrogeology of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be **neutral**, **imperceptible**, and **temporary** in duration (due to the duration of the construction works of the Proposed Development and the proposed Biofuel Facility lasting no more than 12 months).

5.8.2 Operational Phase

In relation to the potential cumulative impacts on the geological or hydrogeological environment from the operational stages, the following could result in a cumulative impact if not adequately mitigated:

- Overall increase in hardstanding: Cumulatively these developments will result in localised reduced recharge to ground and increase in surface water run-off.
- Accidental releases from fuel storage/unloading could contaminate groundwater or soil environments.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified the only simultaneous projects capable of combining with the Permitted Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed Development to combine with the operational phase of the proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

Cumulatively the Proposed Development, the Permitted ICT Facility, and the proposed Biofuel Facility could result in localised reduced recharge to ground. The aquifer underlying the site is a locally important aquifer which is moderately productive only in local zones. Based on site specific and regional geological investigations there is circa <10metres of overburden overlying the bedrock aquifer classifying with a "Moderate" vulnerability (GSI classification). The Proposed Development and known other development have a relatively small footprint in comparison to the underlying aquifer size. As such, the impact is considered to be Low.

Permitted ICT Facility WCC Reg. Ref. 20/1088; is subject to the Environmental Impact Assessment Report and planning conditions which include appropriate mitigation measures to minimise environmental impacts during operation. There is the potential for accidental releases from fuel storage/unloading at the Proposed Development and the Permitted ICT Facility which could contaminate groundwater or soil environments unless mitigated adequately. Localised accidental discharge of hydrocarbons could occur in storage vessels, car parking areas and along roads unless diverted to surface water drainage system with petrol interceptors. The Permitted Development has been designed in conjunction with the Permitted ICT Facility WCC Reg. Ref. 20/1088 to include petrol interceptors to prevent the discharge of hydrocarbons to surface water bodies.

While there is the potential for cumulative impacts between the Proposed Development and the Permitted ICT Facility during operation; the effect is considered to be **neutral**, **imperceptible**, and **long-term** in duration.

The proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181) is similarly; subject to an Environmental Impact Assessment Report which includes appropriate mitigation measures to minimise environmental impacts during operation.

There is the potential for accidental releases from fuel storage/unloading at the Proposed Development and the proposed Biofuel Facility which could contaminate groundwater or soil environments unless mitigated adequately. Localised accidental discharge of hydrocarbons could occur in storage vessels, car parking areas and along roads unless diverted to surface water drainage system with petrol interceptors. All developments (including the proposed Biofuel Facility) are required to ensure they do not have an impact on the receiving water environment in accordance with the relevant legislation (primarily the Local Government (Water Pollution) Act, 1977 and 1990 as amended and Groundwater Threshold Value (Groundwater Directive S.I. No. 9 of 2010 and amendment; S.I. No. 366 of 2016) and EPA Interim Guidelines for groundwater where available) such that they would be required to manage runoff and fuel leakages. While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during operation; the effect is considered to be **neutral**, **imperceptible**, and **temporary** in duration.

With the implementation of mitigation measures to protect soil and water quality in compliance with legislative standards the residual cumulative effect on land, soils, geology and hydrogeology of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be **neutral**, **imperceptible**, and **long-term** in duration.

5.9 REFERENCES

- Guidelines on the information to be contained in environmental impact assessment reports. Environmental Protection Agency (EPA, 2022).
- Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements. Institute of Geologists of Ireland (2013).
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the National Roads Authority (NRA, 2009)
- Geological Survey Ireland Map Viewer (<https://www.gsi.ie>)
- Environmental Protection Agency (EPA) Map Viewer (<https://gis.epa.ie/EPAMaps/>)
- Teagasc Map Viewer (<http://gis.teagasc.ie/soils/map.php>)
- National Parks and Wildlife Services (NPWS) – Protected Site Register.
- Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (2000).
- Dublin County Council's Development Plan, 2022-2028.
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- TII, (2009). Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes; June 2009. Transport Infrastructure Ireland, Dublin.
- Ordinance Survey of Ireland (2021) Geohive online mapping, accessed 11th February 2021.
- Alan Traynor Consulting Engineers Ltd (2022) Foul & Surface Water Calculations & Details. October 2022.

6.0 HYDROLOGY

6.1 INTRODUCTION

This chapter of the EIAR has been prepared by AWN Consulting Ltd. which assesses and evaluates the likely significant effects of the Proposed Development on the hydrological aspects of the site and surrounding area. In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

A description of the proposed development is provided in Chapter 2 (Description of the Proposed Development). Particulars of the proposed development are reiterated herein only insofar as they relate to the assessment of potential impacts on surface water in the receiving environment.

6.2 METHODOLOGY

6.2.1 Guidance and Criteria for rating of effects

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

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

The rating of potential environmental effects on the hydrological environment is based on the standard EIAR impact predictions included in Table 1.2 in Chapter 1 (introduction) which takes account of the quality, significance, duration and type of effect characteristic identified (in accordance with impact assessment criteria provided in the EPA Guidelines (2022) publication).

The NRA/TII criteria for rating the magnitude and significance of impacts and the importance of hydrological attributes at the site during the EIA stage are also relevant in assessing the impact and are presented in Tables 1 to 3 in Appendix 6.1.

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

- River and stream water quality in the vicinity of the site (where available);
- Surface watercourses near the site and potential impact on surface water quality arising from proposed development related works including any discharge of surface water run-off;
- Localised flooding (potential increase or reduction) and floodplains including benefitting lands and drainage districts (if any); and
- Surface water features within the area of the site.

6.2.2 Sources of Information

Desk-based hydrological information in the vicinity of the site was obtained through accessing databases and other archives where available. Data was sourced from the following:

- Department of the Environment, Heritage and Local Government (DEHLG) and the Office of Public Works (OPW) (2009). The Planning System and Flood Risk Management, Guidelines for Planning Authorities;
- River Basin Management Plan for Ireland 2018-2021;
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW));
- Office of Public Works (OPW) flood mapping data (www.floodmaps.ie)
- Relevant Eastern Catchment Flood Risk Assessment and Management (CFRAM) Flood Reports;
- Requirements for the Protection of Fisheries Habitat During Construction and Development Works at River Sites (Eastern Regional Fisheries Board (ERFB));
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters' (Inland Fisheries Ireland, 2016);
- 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001);
- Strategic Flood Risk Assessment. Wicklow County Council Development Plan, 2016-2022.
- National Parks and Wildlife Services (NPWS) – Protected Site Register.

Site specific data was derived from the following sources:

- Information from the site investigations, completed by Ground Investigations Ireland (GII) 2020;
- Foul & Surface Water Calculations & Details (October, 2022), completed by Alan Traynor Consulting Engineers Ltd.
- AECOM Infrastructure Report 2020, submitted with the Permitted ICT Facility
- AECOM Flood Study Report 2020, submitted with the Permitted ICT Facility
- Various design site plans and drawings;
- Consultation with site engineers.

6.3 RECEIVING ENVIRONMENT

The receiving environment is discussed in terms of surface water and hydrology including potential for existing and historical contamination. The proposed development site is c. c. 8.68 hectares of predominantly agricultural land and is located in the townlands of Kish and Boglands, to the south of Arklow, County Wicklow. The subject lands are bounded to the west by the Dublin-Wexford rail line, to the south by Kish Industrial Park and residential dwellings, and to the north and east by greenfield sites – See Figure 6.1 below.

A detailed site description of the site and context can be found in Chapter 2 (Description of development).



Figure 6.1 Site Location and Surrounding Land Use (source: Google Earth Pro, 2022)

6.3.1 Foul Wastewater Infrastructure

There is no existing public foul wastewater network at the site, properties in the adjacent development to the 110 kV Substation site within Kish Business Park treat their wastewater on site. The 110 kV Substation site is drained by a series of agricultural ditches which connect to the Moneylane Stream which ultimately discharges into the Avoca River.

6.3.2 Surface Water Infrastructure

Records of the surface water networks received from Wicklow County Council (WCC) indicate that there is no public surface water infrastructure located within or adjacent to the site. There is a visible attenuation pond serving the adjacent Industrial Park and the planning records indicate that it is discharging to an existing watercourse to the west of the Industrial Park.

The 110 kV Substation site is drained by a series of agricultural ditches which connect to the Moneylane Stream which ultimately discharges into the Avoca River.

6.3.3 Regional Surface Water Environment

According to EPA Maps, the proposed development site lies within the Ovoca-Vartry Catchment (Sub-Catchment: Avoca_SC_020) – See Figure 6.2 below.

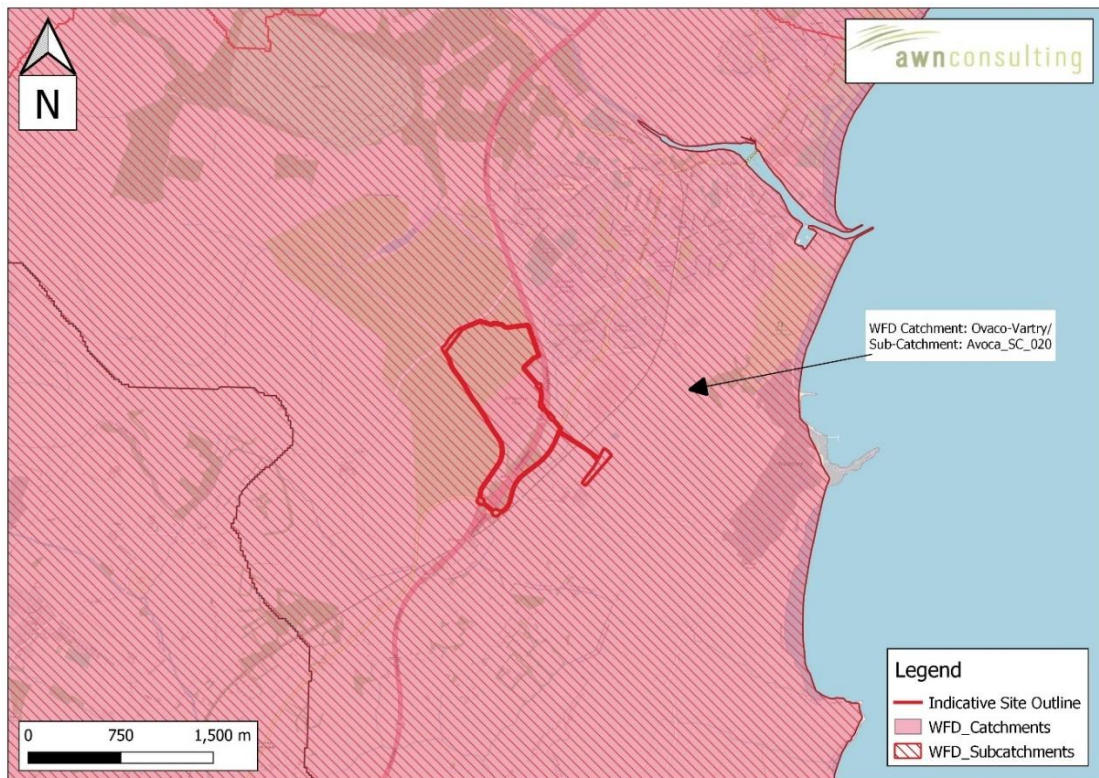


Figure 6.2 WFD Catchments/Sub-Catchments (source: EPA, 2022)

The current EPA watercourse mapping shows existing watercourses within and adjacent to the proposed development site. The Springfield 10 is located in the eastern area of the proposed development site; however, this feature is not shown in any of the historical mapping (1832 to 1913) records provided within the GeoHive website. A site walkover conducted in January 2020 included a visual inspection of this watercourse. This visit was after significant rain and stagnant water was visible in this watercourse, additionally the watercourse is heavily modified with a straight channel delineating a field boundary. The inspection suggests that the watercourse is a manmade drainage feature with intermittent or ephemeral and likely fed from surface runoff from the clay soils shown in the majority of the trial pits across the site.

The Springfield 10 flows in a westerly direction and enters the Moneylane 10 along the site's eastern boundary. The Moneylane 10 flows North before merging with the Ballyduff Stream c. 1.4 km downstream. The Ballyduff Stream enters the River Avoca a further 2.2 km downstream before eventually flowing into the southwestern Irish Sea at Ballybrittas Bay c. 8 km downstream of the proposed development site – See Figure 6.3.

There are no European sites at the mouth of the Avoca River, the closest, Buckroneys-Brittis Dunes and Fen SAC (Site code 000729), is located approximately 5 km to the north of the river mouth. The Kilpatrick Sandhills SAC is located over 6 km to the south along the coast. Potential adverse effects on these European sites from the proposed development are highly unlikely given the distance of removal.

The nearest protected site is the Arklow Rock Askintinny (Site Code 001745). This is an area of outcrop with associated habitat. There is no hydrological connectivity to this proposed Natural Heritage Site.



Figure 6.3 Regional Hydrological Environment (source: EPA, 2022)

6.3.4 Local Surface Water Environment

The site is drained by a local network which is composed of ditches and watercourses (Moneylane 10 & Springfield 10) which traverse the site – Refer to Figure 6.3 above. The Springfield 10 flows in a westerly direction and enters the Moneylane 10 along the sites eastern boundary. The Moneylane 10 flows North before merging with the Ballyduff Stream c. 1.4 km downstream. The Ballyduff Stream enters the River Avoca a further 2.2km downstream before eventually flowing into the southwestern Irish Sea at Ballybrittas Bay c. 8 km downstream of the proposed development site.

6.3.5 Surface Water Quality

The Water Framework Directive (WFD) Directive 2000/60/EC was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater and transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of 'Good Status' in water bodies that are of lesser status at present and retaining 'Good Status' or better where such status exists at present.

The WFD requires 'Good Water Status' for all European waters to be achieved through a system of river basin management planning and extensive monitoring by 2015 or, at the least, by 2027. 'Good status' means both 'Good Ecological Status' and 'Good Chemical Status'. In 2009 the ERBD River Basin Management Plan (RBMP) 2009-2015 was published. In the ERBD RBMP, the impacts of a range of pressures were assessed including diffuse and point pollution, water abstraction and morphological pressures (e.g., water regulation structures). The purpose of this exercise was to identify water bodies at risk of failing to meet the objectives of the WFD by 2015 and include a programme of measures to address and alleviate these pressures by 2015. This was the first River Basin Management planning cycle (2010-2015). The second

cycle river basin management plan for was carried out between 2018-2021 with the previous management districts now merged into one Ireland River Basin District (Ireland RBD). The third cycle (2022-2027) is currently being undertaken.

The primary aim of the plan is that Water bodies identified as being 'At Risk' of not achieving their environmental objectives need to have targeted measures implemented to achieve objectives under this Plan. 190 Areas for Action were identified across the 5 Local Authority regions. Within these 190 areas, a total of 726 water bodies were selected for initial actions during this RBMP cycle. There are 832 water bodies identified as being 'At Risk' of not achieving their environmental objectives under this Plan that have not been included in the Areas for Action. For most of these water bodies, targeted actions will be undertaken in the third cycle RBMP from 2022-2027. The draft third cycle RBMP has been reviewed in the context of ensuring mitigation measures comply with current and expected future measures required to be implemented for protection of water body status within the context of the proposed development.

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

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

The most recent published status (www.epa.ie - River Waterbody WFD Status 2013-2018) is for the Ballyduff stream c. 2.6 km downstream of the proposed development is 'Poor' and its environmental risk is qualified by the WFD is 'At Risk' – See Figures 6.4-6.5.

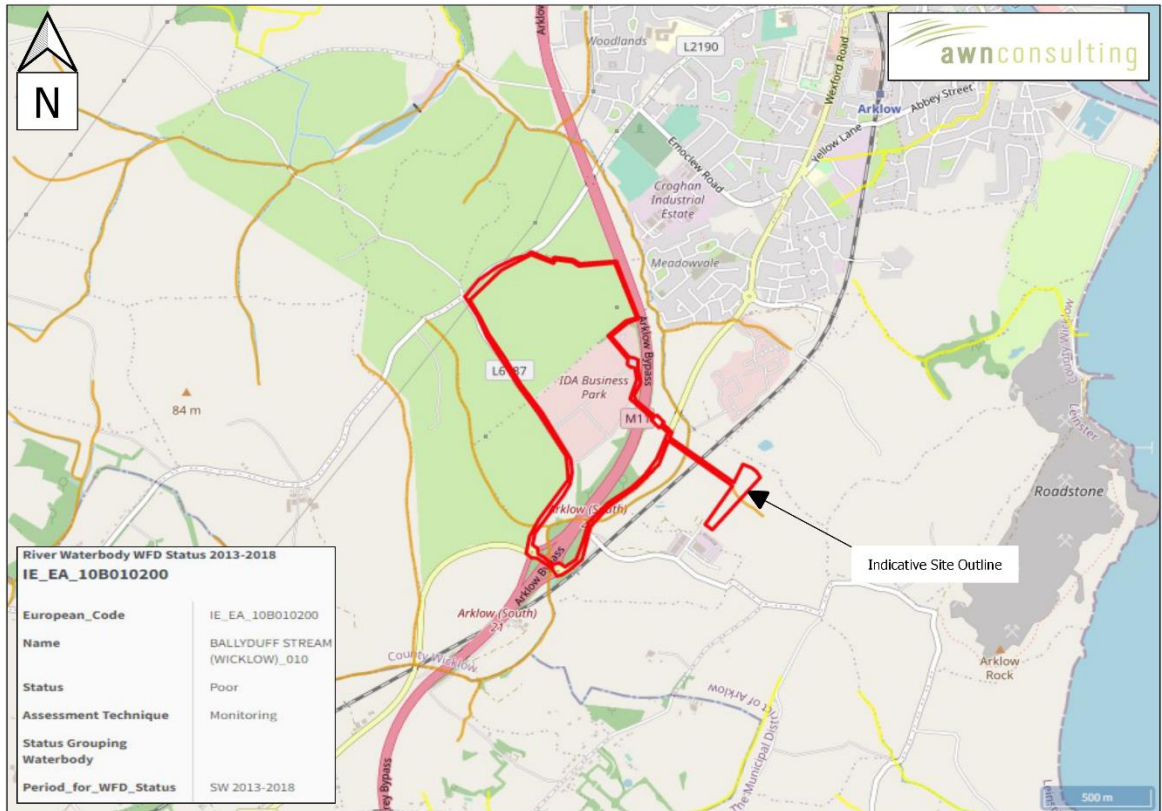


Figure 6.4 River Waterbodies WFD Status 2013-2018 (source: EPAMaps.ie)

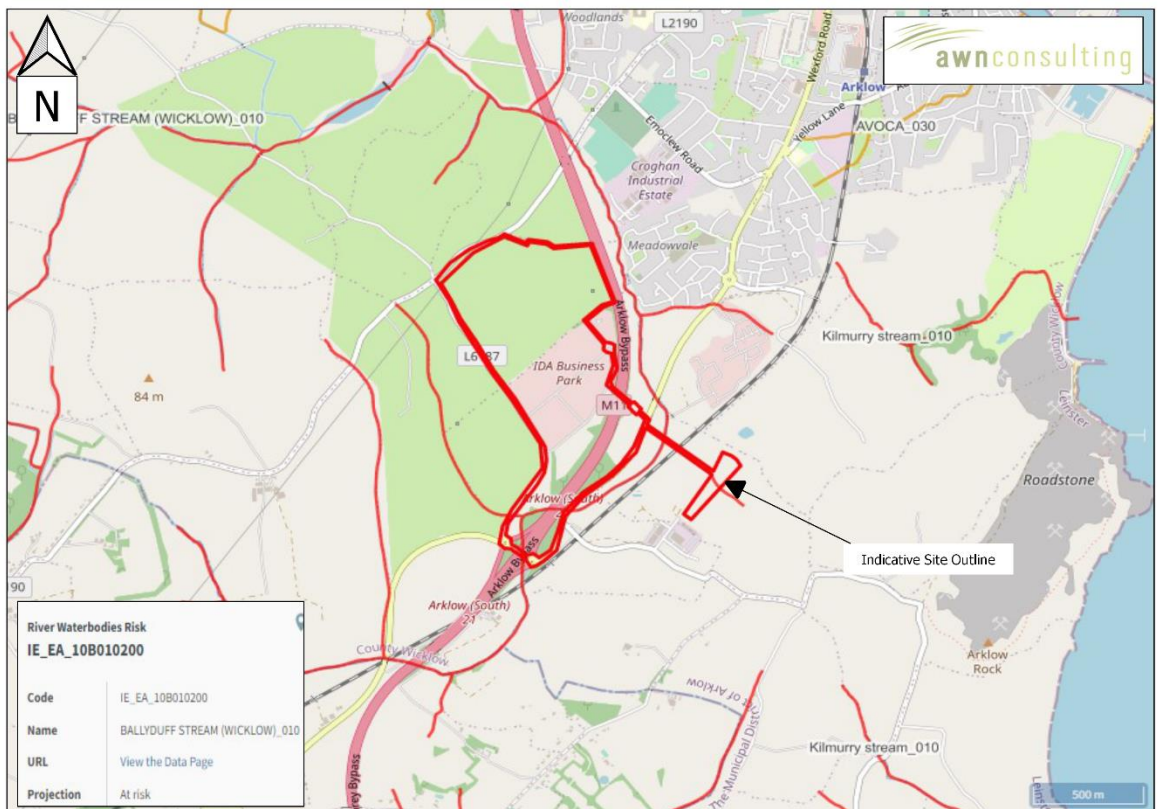


Figure 6.5 River Waterbodies Risk Score (source: EPAMaps.ie)

This classification is based on the historical water quality information from the Ballyduff bridge EPA station (code RS10B010200) which is located at the confluence of the Moneylane and Ballyduff streams, downstream of the Arklow Town Water Treatment Plant, c. 2.2Km to the northwest of the site. There are no water quality monitoring stations located upstream of the subject site – See Figure 6.6 below.

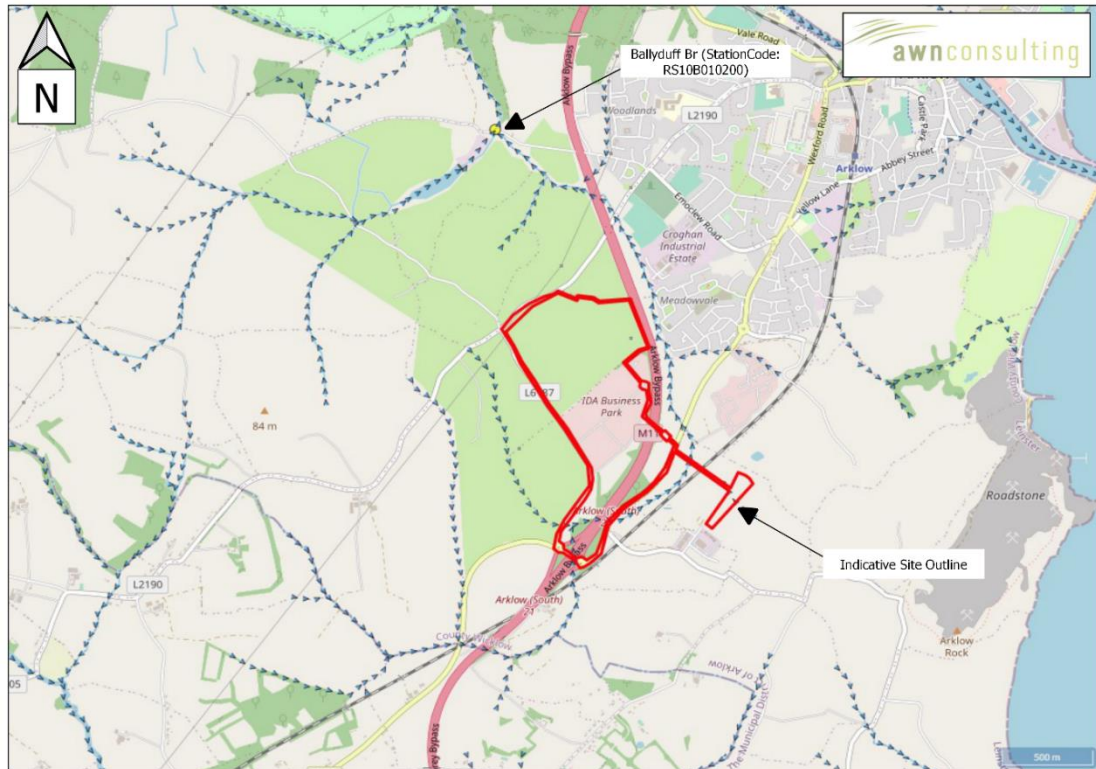


Figure 6.6 Q Value Monitoring Stations – (source: EPAMaps.ie)

According to the EPA information, the ‘poor’ status is based on the following conditions:

- Poor Biological Status (invertebrate status or potential): poor nutrient conditions;
- Moderate chemistry conditions (nitrogen and phosphorous); and
- Good oxygenation and acidification conditions.

Table 6.1 and Figures 6.7-6.9 present data from this station.

Table 6.1 - Quality data from Ballyduff Bridge station (source: www.catchments.ie)

Year	Ammonia-Total (as N) [mg/l]		Ortho-Phosphate (as P) [mg/l]		Total Oxidised Nitrogen (as N) [mg/l]	
	Threshold ¹	Data	Threshold ²	Data	Threshold ³	Data
2007	0.065	0.093	0.035	0.093	1.8	4.42
2008	0.065	0.105	0.035	0.065	1.8	4.439
2009	0.065	0.116	0.035	0.099	1.8	3.978
2010	0.065	0.225	0.035	0.109	1.8	3.804
2011	0.065	0.1	0.035	0.088	1.8	4.173
2012	0.065	0.054	0.035	0.066	1.8	3.91
2013	0.065	0.064	0.035	0.059	1.8	4.03
2014	0.065	0.27	0.035	0.113	1.8	3.57
2015	0.065	0.37	0.035	0.174	1.8	2.517
2016	0.065	0.072	0.035	0.142	1.8	4.14
2017	0.065	0.121	0.035	0.133	1.8	4.8
2018	0.065	0.068	0.035	0.079	1.8	4.78

Notes: 1: Indicative of 'Good Status'. SI 77/2019
 2: Indicative of 'Good Status'. SI 77/2019
 3: Estimated by EPA according to SI 77/2019

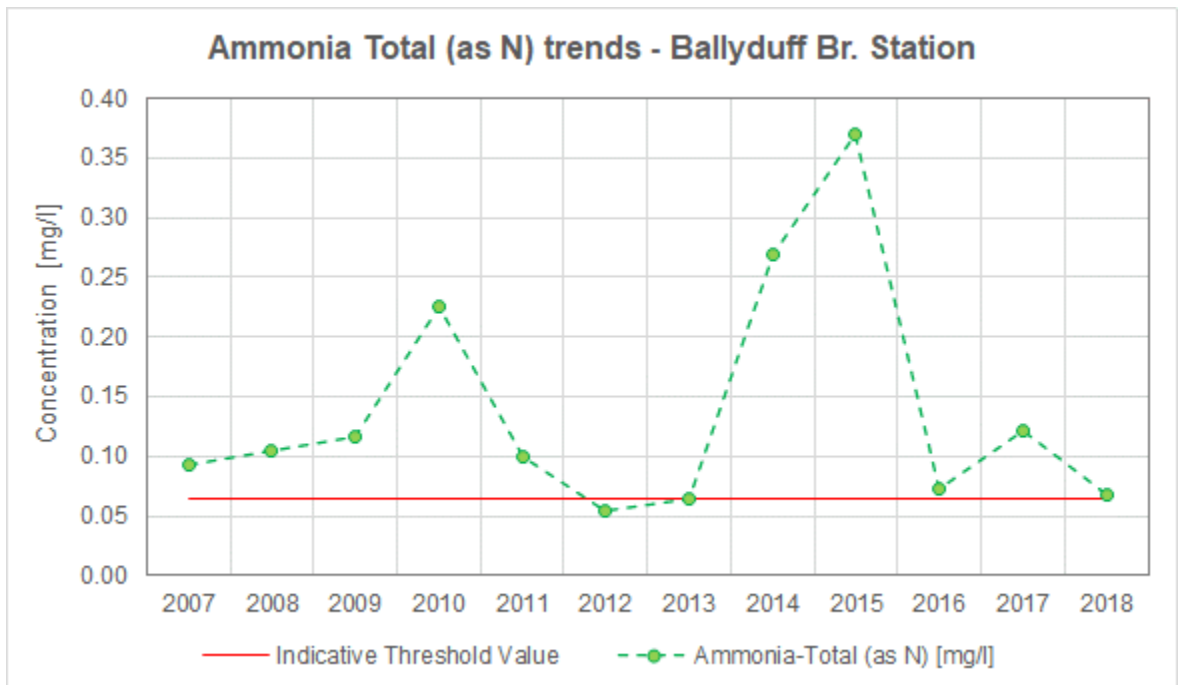


Figure 6.7 Ammonia Total (as N) trend at Ballyduff Bridge Station. (Source: www.catchments.ie)

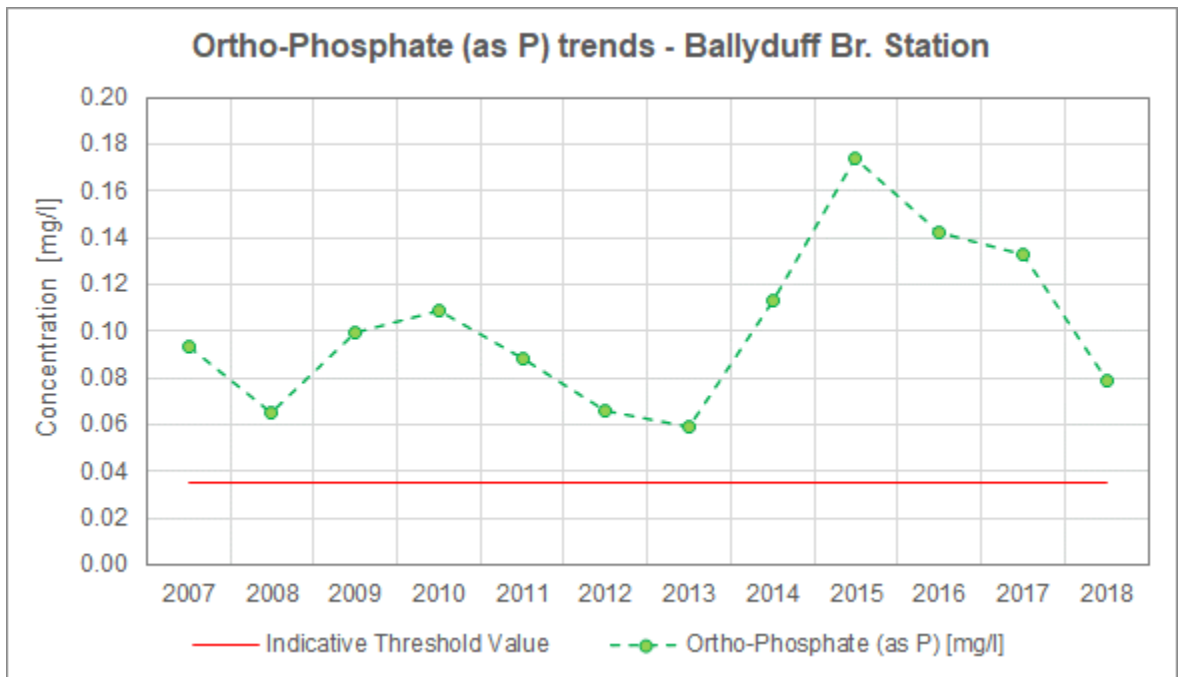


Figure 6.8 Ortho-Phosphate (as P) trend at Ballyduff Bridge Station. (Source: www.catchments.ie)

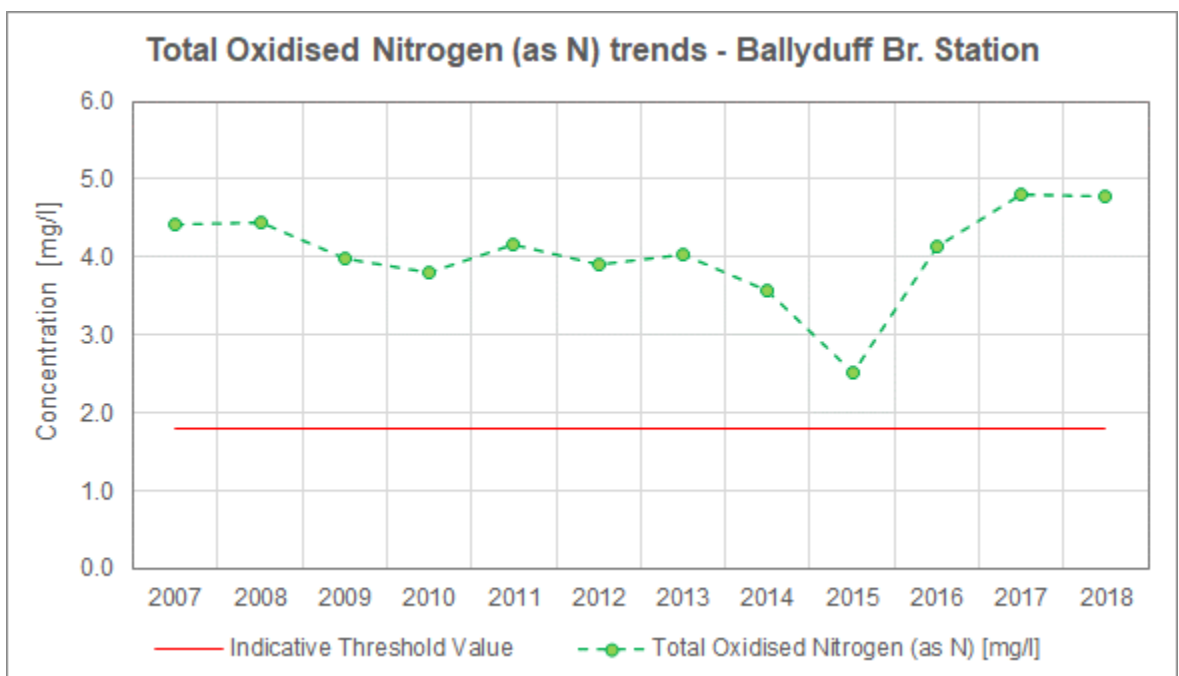


Figure 6.9 Oxidised Nitrogen (as N) trend at Ballyduff Bridge Station. (Source: www.catchments.ie)

As it can be seen from the graphs above, nitrogen trend is upward and clearly over the indicative threshold value. Orthophosphate shows a downward trend but is still over the threshold value as well as Ammonia, which shows a downward trend, but the 2018 value is slightly over the threshold value. These threshold values are indicative of the WFD ‘Good Status’ (source: European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019; SI 77/2019)

Surface water quality is monitored periodically by the EPA at various regional locations along with principal and other smaller watercourses. The EPA assesses the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality – See Table 6.3.

The available results of the nearest biological water quality monitoring is the Ballyduff Stream (Ballyduff Bridge station mentioned above). The EPA water quality monitoring locations are provided in Table 6.2 and the legends to explain the Biological Rating System (Q Values) are provided in Table 6.3. As can be seen from the monitoring data, the Ballyduff stream is currently classified as Poor according to River Waterbody WFD Status 2013-2018.

Table 6.2 - EPA Q Ratings for the Ballyduff Stream

BALLYDUFF STREAM (WICKLOW)											10B01
Date Surveyed (last survey year only): 12/07/18											
Biological Quality Rating (Q Values)											
Station Code	1990	1994	1997	2000	2003	2006	2009	2012	2015	2018	
RS10B010200	3-4	3-4	3	3/0	3-4*	3-4	3-4*	3	3*	3*	
Most Recent Assessment:											
The dominance of pollution tolerant macroinvertebrate fauna coupled with the excessive filamentous algal growth and excessive instream siltation continues to indicate unsatisfactory poor ecological conditions on the Ballyduff Stream in July 2018.											
Station Details											
Station Code	Station Location	WFD Waterbody Code	Easting	Northing	Local Authority						
RS10B010200	Ballyduff Br	IE_EA_10B010200	322207	173087	Wicklow County Council						

Table 6.3 - Rating system

Q Value	WFD Status	Pollution Status	Condition
Q5, Q4-5	High	Unpolluted	Satisfactory
Q4	Good	Unpolluted	Satisfactory
Q3-4	Moderate	Slightly polluted	Unsatisfactory
Q3, Q2-3	Poor	Moderately polluted	Unsatisfactory
Q2, Q1-2	Bad	Seriously polluted	Unsatisfactory

6.3.6 Flood Risk

AWN have produced a Flood Risk Assessment (Appendix 6.2) for the subject site this is included with the planning documentation and is summarised here.

The online OPW flood map displays the areas throughout Ireland which are susceptible to flooding events. They can display the sites which are liable to fluvial flooding in low, medium and high probability flood events. In this online tool the development site is outside any identified flood zones and does not indicate the site is at risk from any fluvial, pluvial or coastal flooding event.

Wicklow County Council have produced a Strategic Flood Risk Assessment (SFRA) within the Wicklow County Development Plan 2016-2022. This showed the Moneylane/Ballyduff stream and its surroundings within Flood Zone A and B. Because the predictive flood maps show the subject development land is not in the flood extent, the risk of fluvial flooding on this site is low.

Wicklow County Council also published the Arklow Town and Environs Development Plan 2018-2024 in February 2018. It is noted that the site is again shown outside of the predictive Flood Zones A and B. Because the predictive flood maps show the subject development land is not in the flood extent, the risk of fluvial flooding on this site is low.

The AWN Flood Risk Assessment for the site concluded that for the proposed development there is:

- No risk associated with coastal flooding for this site;
- No fluvial flooding threat to the site of the;
- The subject site is located in Flood Zone C with respect to coastal and fluvial flooding and the 2 No. 110kV transmission lines will be underground. Therefore, this does not pose a risk to flooding. Therefore, the development is classified as appropriate for this flood zonation.
- The proposed development is classed as less vulnerable developments and These are considered a suitable land use for Flood Zone C which also negates the need for a Justification Test.

A review of the OPW Preliminary Flood Risk Assessment (PFRA) mapping data (pluvial flood extents) indicates that there is no record of pluvial flooding events within the site boundaries. Furthermore, the site in the proposed scenario will be developed and carefully managed for surface water runoff and attenuation will be in place to cater for the 1 in 100 year rainfall event as per the GSDSDS document. There are no historic flood events recorded in the vicinity of the site.

We note that in case of emergency there is vehicular access for Fire and Ambulance services to the building from the existing local access road. Residual flood risk will be managed through the use of emergency plans and evacuation procedures. It is also noted that the proposed development will not increase the flood risk elsewhere since the surface water run-off will be restricted to greenfield run-off rate.

6.3.7 Areas of Conservation

There are no proposed Special Areas of Conservation (SAC's), Special Protection Areas (SPA's) or Natural Heritage area (NHA's) within the study area boundary, nor does a hydrological connection exist. According to the NPWS (2019) on-line database, the following area of conservation are located closest to the subject site (refer to Table 6.4). The site does not have hydrological connection with any nearby protected habit areas.

Table 6.4 - Details of European sites within the potential zone of impact of the project.

Site Code	Site Name	Distance (km) ¹
001745	Arklow Rock Askintinny (pNHA)	1 (east)
001931	Arklow Town Marsh (pNHA)	1.8 (north)
001742	Kilpatrick Sandhills (SAC-pNHA)	4.9 (southeast)
000729	Buckronev – Brittas Dunes And Fen SAC	5.1km (northeast)

¹ Distances indicated are the closest geographical distance between the proposed Project and the European site boundary, as made available by the NPWS. Connectivity along hydrological pathways may be significantly greater.

The nearest European site to the proposed development is the Arklow Rock Askintinny (Site Code 001745) which is an area of outcrop and associated habitat. Drainage at the site does not discharge to this area – See **Figure 6.10** below.



Figure 6.10 Conservation Areas in context of the proposed development site (Source: EPA, 2022)

The subject site is hydraulically linked via the Moneylane Stream, which is a tributary of the Avoca River. The Avoca River flows into the Irish Sea at Arklow c. 8km downstream of the proposed development site. There are no European sites at the mouth of the Avoca River, the closest, Buckroneys-Brittis Dunes and Fen SAC (Site code 000729), is located approximately 5 km to the north of the river mouth. The Kilpatrick Sandhills SAC is located over 6km to the south along the coast. Potential adverse effects on these European sites from the proposed development are highly unlikely given the distance of removal.

6.3.8 Rating of Site Importance of Hydrological Features

Based on the NRA methodology (2009) (refer to Appendix 6.1), criteria for rating site importance of hydrological features, the importance of the hydrological attributes at this site is rated as 'Medium' to 'Low' importance with medium to low quality or value on a local scale, due to the status of the river waterbodies in the vicinity of the site, which are classified as 'Poor' by the WFD with a 'at risk' status.

6.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development primarily comprises the provision of two no. 110 kV transmission lines (Circuit Route A & Circuit Route B) and a 2 storey 110 kV Gas Insulated Switchgear (GIS) Substation compound and transformer compound along with associated and ancillary works. The substation compound includes stormwater

and foul water, drainage works, all internal road/footpath access routes, landscaping and boundary treatment works. The proposed 110 kV Substation will serve the ICT Facility permitted under WCC Reg. Ref.: 201088.

The Proposed Development will provide full attenuation for increase in hardstand area in compliance with the requirements of the Greater Dublin Strategic Drainage Study. A number of measures will be put in place to minimise the likelihood of any spills entering the water environment to include the design of the car park, fitting of refuelling areas with hydrocarbon interceptors and on-site speed restrictions.

A Pre-Connection Enquiry form has been issued to Irish Water in relation to the feasibility of servicing the Permitted ICT Facility with a water supply connection (CDS21001316). Irish Water issued a Confirmation of Feasibility letter on 4 January 2022 (see Appendix 13.1) to confirm that the proposed water supply connection to the Irish Water network can be facilitated subject to upgrades. For further details see Foul & Surface Water Calculations & Details completed by Alan Traynor Consulting Engineers Ltd (2022) provided as part of this planning application.

Circuit Route A, Circuit Route B are liner routes that are described further below.

Cable Circuits and New Masts

The underground cable (Cable Circuit A) is a single circuit 110 kV cable and communications ducts and 5 joint bays that will follow a liner route of 2,888 m; originating at the proposed 110 kV Substation and terminating at the existing 110 kV Arklow – Banoge overhead line. The 2,888 m route can be summarised as approximately:

- extending to the north-west c. 434 m from the proposed 110 kV Substation including a 103 m horizontal directional drilling (HDD) crossing under the Dublin-Rosslare rail line via.
- c. 800 m in the existing carriageway ducting along the R772 to the M11 Junction 21
- c. 300 m in carriageway through the M11 Junction 21
- Proceeding to the northwest c. 1,400 m in the existing carriageway along the L6187.
- At the terminus the cable connects to the existing 110 kV Arklow – Banoge overhead line via a proposed c. 17 m above ground level lattice mast adjacent to Knockeneahan Road (L2190).

The underground cable (Cable Circuit B) is a single circuit 110 kV cable and communications ducts and 4 joint bays that will follow a liner route of 2,164 m; originating at the proposed 110 kV Substation and terminating at the existing 110 kV Arklow – Banoge overhead line. The 2,164 m route can be summarised as approximately:

- extending to the north-west c. 416 m from the proposed 110 kV Substation including a 103 m horizontal directional drilling (HDD) crossing under the Dublin-Rosslare rail line via.
- 158 m in farmland crossing, and carriageway ducting along the R772
- 142 m under the M11 via HDD
- 600 m in private road (IDA), and future development lands (IDA)
- 900 m in farmland

- At the terminus the cable connects to the existing 110 kV Arklow – Banoge overhead line via a proposed c. 17 m above ground level lattice mast adjacent to Knockeneahan Road (L2190).

6.4.6 Construction Phase

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

- Excavations are required for foundations of the two-storey substation and installation of services including the ducting for the 110 kV transmission lines.
- Possible discharge of collected rainwater during excavation works and groundworks (the extent of which is dependent on the time of year development works are carried out); and
- Construction activities will necessitate storage of cement and concrete materials, temporary oils, and fuels on site. Small localised accidental releases of contaminating substances including hydrocarbons have the potential to occur from construction traffic and vehicles operating on site.
- Horizontal Directional Drilling (HDD) drilling is required for the installation of the two transmission cables (Circuit Route A & Circuit Route B).
- Based on a review of the local information and historical and present-day knowledge on the ground conditions near the site, it is not anticipated that any exceptional or unusual risks are posed by the ground conditions which would cause difficulties during HDD operations at the site.

6.4.7 Operational Phase

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

- Increase in local overall hardstand by c. 4,120m².
- The attenuation for the permitted ICT Facility development has been designed to account for the proposed development site (110 kV substation). Storm water originating at the 110 kV substation will be discharged to the surface water system permitted under WCC Reg Ref: 201088. Potential contamination of surface water with hydrocarbons from vehicle movements and other areas could cause downstream contamination if no controls in place;
- Wastewater generation will be minimal and will be discharged to the foul water drainage system installed during the proposed development (no discharges to ground/surface waters) which will discharge to the permitted foul drainage system as part of the ICT Facility permitted under WCC Reg Re. 201088; and
- Water supply (minimal requirement) will be from the public water main and will not require surface water/groundwater abstraction.

For further details see Foul & Surface Water Calculations & Details completed by Alan Traynor Consulting Engineers Ltd (2022) provided as part of this planning application.

6.5 POTENTIAL IMPACTS OF THE DEVELOPMENT

An analysis of the potential impacts of the proposed development on the and hydrological environment during the construction and operation is outlined below. Due to the inter-relationship between soils, geology and hydrogeology and surface water the following impacts discussed will be considered applicable to both Chapter 5 and 6

of the EIAR. Remediation and mitigation measures included in the design of this project to address these potential impacts are presented in Section 6.6 below.

6.5.1 Construction Phase

Water Framework Assessment

In terms of the construction phase, this assessment has considered the current water status of all relevant water bodies (Section 6.3.5 above), and potential impacts have been considered (Section 6.5 above). With mitigation measures in place, it is concluded there will be no degradation of the current water body (chemically, ecological and quantity) or any impact on its potential to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

There are appropriately designed mitigation and design measures which will be implemented during the construction phase to protect the hydrological environment. There is a potential of accidental discharges during the construction phase, however these are temporary short-lived events that will not impact on the water status of waterbodies long-term and as such will not impact on trends in water quality and overall status assessment.

There will be limited impact on the surrounding hydrological environment from the activity of shallow temporary dewatering. There is limited dewatering required for the proposed development. As such the proposed development will not have an impact on the quantitative aspects in consideration of water body status.

The project-specific CEMP (AWN, 2022), will implement strict mitigation measures to ensure the protection of the hydrological environment during construction which will ensure that there will be no negative impact on the quantitative or qualitative or morphology of the nearby watercourses.

Overall, this WFD screening has shown there is no potential for change in the water body status and risk as a result of the construction phase of the proposed development.

Increased Run-off and Sediment Loading

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

As there is potential for contaminated run-off to enter directly discharge to the Moneylane 10 & Springfield 10, which traverse the site and existing on-site drainage ditches, mitigations will be put in place to manage run-off during the construction phase.

During the construction phase at this site there is potential for an increase in run-off due to the introduction of impermeable surfaces and the compaction of soils. This will reduce the infiltration capacity and increase the rate and volume of direct surface run-off. The potential impact of this is a possible increase in surface water run-off and sediment loading which could potentially impact local drainage. Previous uses of the site and site testing has not indicated any evidence of soil contamination at the site.

There is a possible direct pathway from the excavations works area to the surface water drainage ditches onsite and the Moneylane Stream via over land flow. Mitigation measures highlighted in Section 6.6.2 will be employed to remove the risk to the open section of the Moneylane Stream.

Uncontrolled Discharges, Fuel and Other Accidental Spills

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

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

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

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

The implementation of the mitigation measures detailed in Section 7.6 will ensure that any impact will be mitigated.

6.5.2 Operational Phase

Water Framework Assessment

In terms of the operation phase, this assessment has considered the current water status of all relevant water bodies (Section 6.3.5 above), and potential impacts have been considered (Section 6.5 above). With mitigation measures in place, it is concluded there will be no degradation of the current water body status (chemically, ecological and quantitative) or its potential to meet the requirements and/or objectives and measures in the second [current] RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027. There are no discharges of water during the operational phase to any open waterbody/ watercourse and no groundwater dewatering for the Project.

There is no dewatering associated with the operational phase, hence there is no impact on the hydrological environment in terms of baseflow.

Overall, this WFD screening has shown there is no potential for change in the water body status and risk as a result of the operation of the proposed development.

Surface Water

It is proposed to collect runoff from the roofs and all hardstand areas using road gullies and a suitably sized network and discharge into the the Permitted ICT Facility storm which will run in the south western access road. Prior to discharging into this storm sewer in the access road, all run-off will pass through a petrol interceptor. There is no requirement for additional attenuation measures as the Permitted ICT Facility attenuation basin has been designed to accommodate all proposed run-off for the entire development.

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

Uncontrolled Discharges, Fuel and Other Accidental Spills

There is a potential for leaks and spillages of the fuel and oil during storage and transport. In addition to this there is a potential for localised leaks and spillages from vehicles along access roads and in parking areas. Any accidental emissions of oil, petrol or diesel could cause contamination if the emissions enter the water environment unmitigated.

Water Supply

The 110 kV Cable Circuits and Mast do not require an operational potable water supply. The proposed 110 kV Substation building has a potable water requirement associated with the toilet, and canteen facilities within the GIS building. The substation building is an unmanned facility with visiting maintenance crews. This is generally a two-man crew visiting the site for 2 days per month.

Irish Water issued a Confirmation of Feasibility letter on 4 January 2022 (see Appendix 13.1) to confirm that the proposed water supply connection to the Irish Water network can be facilitated subject to upgrades.

There are no potential adverse impacts on water resources during operation.

Foul Wastewater

The 110 kV Cable Circuits and Mast do not require an operational foul water supply. The proposed 110 kV Substation building has a foul water requirement associated with the toilet, and canteen facilities within the GIS building. The 110 kV Substation is an unmanned facility with visiting maintenance crews. This is generally a two-man crew visiting the site for 2 days per month.

Irish Water issued a Confirmation of Feasibility letter on 4 January 2022 (see Appendix 13.1) to confirm that the proposed foul water connection to the Arklow WWTP / Irish Water network can be facilitated subject to onsite treatment and upgrade works.

The Permitted ICT Facility includes for on-site treatment of foul water before being pumped via a rising main along the link road and discharge into a receiving discharge manhole located beside the existing Kish Business Park pumping station. Treated effluent then gravity flows into the existing pumping station in Kish Business Park. From that point effluent is pumped southwest along the railway line, under the railway line

and then northeast to a gravity network which terminates at the Croghan Industrial Estate Pumping Station.

There are no potential adverse impacts due to foul water during operation.

6.6 REMEDIAL AND MITIGATION MEASURES

6.6.6 Operational Phase

Storm Water

Rainwater runoff from the substation roofs, car parking areas and yard will be collected in stormwater drainage channels and diverted to a stormwater attenuation system (sized for a 1 in 100-year rainfall event +20% climate change). The surface water drainage system incorporates all developments within the applicant's landholding. This surface water drainage system is being installed as part of the planning permission for this development. The SuDs features have been designed to accommodate surface water drainage from the proposed development. Attenuation measures include bio retention areas, attenuation ponds, swales, filter drains, permeable paving and hydrocarbon interceptors. Refer to the planning drawings and the details of the drainage system is set in the Engineering Services Report completed by Alan Traynor Consulting Engineers Ltd (2022) provided as part of this planning application.

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

Foul Sewer Drainage

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

Water supply

Water will be supplied by Irish Water mains. An agreement will be reached with Irish Water to progress with the connection, and the Applicant will fund a portion of the extension works. The use of water on site will be metered, in accordance with Irish Water requirements and specifications, will be installed at the connections onto the aforementioned existing water mains as required.

Environmental Procedures

There will be comprehensive emergency response procedures and standard operating procedures to respond to chemical spillage all types. All employees will be provided

with such equipment, information, training and supervision as is necessary to implement the emergency response procedures and standard operating procedures.

6.6.7 Construction Phase

Construction Environmental Management Plan (CEMP)

A Construction Environmental Management Plan (CEMP) has been prepared in respect of the proposed development by AWN (refer to Chapter 2 Description of the Proposed Development Appendix 2.1). It contains best practice measures and protocols to be implemented during the construction phase of the proposed development to avoid / minimise environmental impacts, including in relation to surface water.

To ensure the CEMP remains fit for purpose, it will be regarded as a live document. The appointed contractor will be responsible for updating the CEMP, as required; e.g. to reflect the publication of relevant new or revised guidelines and / or new statutory requirements. The full schedule of environmental commitments (i.e. all mitigation measures set out in the CEMP, Environmental Impact Assessment Report and Natura Impact Statement submitted as part of the planning application, as well as any applicable conditions of development consent) will be included in the CEMP by the appointed contractor.

The CEMP was formulated in accordance with best international practice including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, (C532) Construction Industry Research and Information Association;
- CIRIA (2002) Control of water pollution from construction sites: guidance for consultants and contractors (SPI56) Construction Industry Research and Information Association
- CIRIA (2005), Environmental Good Practice on Site (C650); Construction Industry Research and Information Association
- BPGCS005, Oil Storage Guidelines;
- Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites;
- CIRIA 697, The SUDS Manual, 2007; and
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004.

All contractors will be required to implement the CEMP.

Surface Water Run-off

The construction phase will require that run-off water containing silt will be contained on site via settlement tanks and treated to ensure adequate silt removal. Silt reduction measures on site will include a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds, 20m buffer zones between machinery and watercourses and the refuelling of machinery offsite).

The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection. This will prevent any potential negative impact on the stormwater drainage and the material will be stored away from any surface water drains. Movement of material will be minimised to reduce

the degradation of soil structure and generation of dust. Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations. Soil from works will be stored away from existing drainage features to remove any potential impact.

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

Due to the projected drain crossing and the presence of open ditches and watercourses site works will comply with current best practice, notable the Inland Fisheries Ireland Guidelines on protection of fisheries during construction works in and adjacent to waters (IFI, 2016) and Transport Infrastructure Ireland's Guidelines for the crossing of watercourses during the construction of national road schemes (TII, 2008).

Uncontrolled Discharges, Fuel and Other Accidental Spills

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

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

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

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

All contractors will be required to implement mitigation measures included in the CMP.

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

Soil Removal and Compaction

Excavated material will be reused on site where possible for site levelling, roads, car parking areas, berms and other landscaping purposes. Surplus material will be removed off-site for reuse, recovery and/or disposal. Temporary storage of soil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment. The material will be stored away from any surface water drains (see Surface Water Run-off section above). Movement of material will be minimised to reduce degradation of soil structure and generation of dust.

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

6.7 RESIDUAL EFFECTS OF THE PROPOSED DEVELOPMENT

An analysis of the potential impacts of the proposed development on the hydrological environment during the construction and operation is outlined below. Due to the inter-relationship between soils, geology and hydrogeology and surface water the following impacts discussed will be considered applicable to both Chapter 5 (Land, Soils, Geology & Hydrogeology) and 6 (Hydrology) of the EIAR.

6.7.1 Construction Phase

The implementation of mitigation measures highlighted in Section 6.6.1 will ensure that the potential impacts on the surface water environment do not occur during the construction phase and that the residual effect will be **short-term, imperceptible, and neutral**.

6.7.2 Operational Phase

The implementation of mitigation measures highlighted in Section 6.6.2 will ensure that the potential impacts on the surface water environment do not occur during the operational phase and that the residual effect will be **short-term, imperceptible and neutral**.

6.8 CUMULATIVE EFFECTS OF THE DEVELOPMENT

The potential for cumulative impact (as far as practically possible) of the Proposed Development with any/all relevant planned, existing or permitted developments as set out in Chapter 2, Section 2.8 and 2.9 of the EIAR, unless otherwise stated. The likelihood of cumulative effects are discussed in Sections 6.8.1 and 6.8.2 below for construction and operational phases.

6.8.1 Construction Phase

In relation to the potential cumulative impact on the geological or hydrogeological environment during the construction phases, those key engineering works which could result in cumulative impact if not adequately mitigated include:

- Contamination of surface water (Moneylane Stream) from accidental spillage and leakage from construction traffic and construction materials may occur unless project-specific mitigation measures implemented via a Construction Environmental Management Plans (CEMPs) are put in place. A project-specific CEMP's will be implemented for the Proposed Development.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified the only simultaneous construction projects capable of combining with the Permitted Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed Development to combine with the construction phase of the Biofuel Facility proposed under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

There is a direct pathway from the site to the Moneylane Stream via over land flow that will require appropriate management. The permitted development WCC Reg. Ref. 20/1088 includes for the removal, infilling and redirection of the existing agricultural ditches that currently drain the site. Surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction.

Permitted ICT Facility WCC Reg. Ref. 20/1088; is subject to the Environmental Impact Assessment Report and planning conditions which include appropriate mitigation measures to minimise environmental impacts. Furthermore, Condition 8 of WCC Reg. Ref. 20/1088 requires the works contractor to provide a detailed Construction Environmental Management Plan (CEMP) for the Permitted ICT Facility. The CEMP for the Permitted ICT Facility will ensure that this project will be managed in a safe and organised manner by the Contractor. All run-off will be prevented from directly entering into the existing water courses and drainage ditches. The proposed mitigation measures set out in Section 6.6 along with implementations of the Permitted ICT Facilities planning conditions will ensure there are no significant cumulative effects.

The respective CEMP prepared by AWN Consulting Ltd (2022) incorporates measures to protect water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and S.I. 77 of 2019). Thus, the potential for downstream in-combination effects impacts is considered highly unlikely. While there is the potential for cumulative impacts between the Proposed Development and the Permitted ICT Facility during a simultaneous construction phase; the effect is considered to be **neutral**, **imperceptible**, and **temporary** in duration (due to the duration of the construction works of the Proposed Development lasting no more than 12 months).

The proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181 is similarly; subject to an Environmental Impact Assessment Report which includes appropriate mitigation measures to minimise environmental impacts. The proposed Biofuel Facility application included an outline Construction Management Plan (CMP). The CMP for the proposed Biofuel Facility will ensure that this project will be managed in a safe and organised manner by the Contractor. While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during a simultaneous construction phase; the effect is considered to be **neutral**, **imperceptible**, and **temporary** in duration (due to the duration of the construction works of the Proposed Development and the proposed Biofuel Facility lasting no more than 12 months).

Overall there will be no significant cumulative impact to surface water quality from the Proposed Development in combination with the Permitted ICT Facility, and the proposed Biofuel Facility, therefore, there will be no cumulative impact on the Surface Waterbody Status and minimal cumulative potential for change in the natural hydrological regime.

With the implementation of mitigation measures to protect soil and water quality in compliance with legislative standards the residual cumulative effect on land, soils, geology and hydrogeology of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be **neutral**, **imperceptible**, and **temporary** in duration (due to the duration of the construction works of the Proposed Development lasting no more than 12 months).

6.8.2 Operational Phase

In relation to the potential cumulative impacts from the operational stages, the following could result in a cumulative impact if not adequately mitigated:

- foul drainage infrastructure and water supply requirements
- Accidental releases from fuel storage/unloading could contaminate surface water environments.

During operation there is no potential for increase in flooding as each permitted development which receives permission from the local authority is required to comply with the Greater Dublin Strategic Drainage Strategy (GDSDS) and local authority requirements by providing suitable attenuation on site to ensure greenfield run-off rates and ensure that there is no increase in off-site flooding as a result of development.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified the only simultaneous projects capable of combining with the Permitted Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed Development to combine with the operational phase of the proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

Cumulatively the Proposed Development, the Permitted ICT Facility, and the proposed Biofuel Facility could result an increase in surface water run-off. The Permitted Development has been designed in conjunction with the Permitted ICT Facility WCC Reg. Ref. 20/1088 to manage surface water in as a singular project to ensure that surface water runoff does not increase above the existing greenfield runoff rates. The proposed Biofuel Facility if permitted will be required to comply with the Greater Dublin Strategic Drainage Strategy (GDSDS) and local authority requirements by providing suitable attenuation on site to ensure greenfield run-off rates and ensure that there is no increase in off-site flooding as a result of development.

The foul drainage infrastructure and water supply requirements for the Proposed Development has been designed concurrently with the Permitted ICT Facility. A pre-connection enquiry (PCE) form was submitted to Irish Water which addressed water and wastewater demand for the overall project. The reference number for the Pre-Connection Enquiry is CDS21001316. A pre connection enquiry to Irish Water has been submitted (CDS21001316). Irish Water issued a Confirmation of Feasibility letter on 4 January 2022 to confirm that the proposed wastewater connection to the Irish Water network can be facilitated subject to upgrades. An increase in wastewater loading and water supply requirement is an impact of all development. The permitted

developments will require approval from Irish Water (IW) confirming available capacity in the water and wastewater infrastructure.

With the implementation of mitigation measures to protect water quality runoff in compliance with legislative standards the residual cumulative effect on hydrology of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be **neutral**, **imperceptible**, and **long-term** in duration.

7.0 BIODIVERSITY; FLORA AND FAUNA

7.1 INTRODUCTION

This chapter provides an assessment of the impacts of the proposed development; the construction and operation and decommissioning of a Grid Connection for a Data Storage Facility at Kish, Arklow, Co. Wicklow on the ecological environment, i.e. flora and fauna. It has been compiled in compliance with 2014 EIA Directive, the Planning and Development Act 2000 as amended, and the European Commission's guidance on the preparation of the EIA Report (2017), and follows the EPA EIA Report Guidelines (2022).

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

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

7.1.1 Legislation, Policy and Guidance

7.1.1.1 EU Habitats Directive

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

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

7.1.1.2 EU Birds Directive

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

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

7.1.1.3 Wildlife Acts (1976 - 2021)

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

7.1.1.4 Birds and Natural Habitats Regulations

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

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

7.2 METHODOLOGY

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

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

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

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

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

7.2.1 Study Area

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

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

Habitats

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

Rare and/or Protected Flora

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

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

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

Bats

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

Wintering Birds

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

The study area of this assessment included the footprint of the proposed development area at Kish, as detailed below and shown on Figure 7.1.



Figure 7.1 Detail of site Location and redline boundary.

7.2.2 Ecology Surveys

7.2.2.1 Habitat Surveys

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

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

Habitats were surveyed on 19 August 2022 by conducting a study area walkover covering the main ecological areas identified in the desktop assessment. The survey date is appropriate for surveying flora, birds and non-volant mammals such as badgers. A photographic record was made of features of interest.

The key ecological receptors were determined from desktop review of draft plans to be the dividing hedgerow on site and the potential for invasive species along the grid connection route.

7.2.2.2 Mammals (Excluding Bats)

Signs of mammals such as badgers and otters were searched for while surveying the study area noting any sights, signs or any activity in the vicinity especially along adjacent boundaries.

A previously recorded Badger sett under the footprint of the proposed Data Storage Facility and specifically the 110 kV Substation area was resurveyed by Brian Keeley during Summer 2022 (see Appendix 7.2).

The second assessment was undertaken over two visits in August 2022. The first visit was on 17th August 2022 and involved an examination of the lands for badger signs and the installation of a camera at a previously identified badger sett in the southern area of the lands. This camera was left in place until 31st August 2022. A second camera was placed along a nearby fence to determine if there was high badger activity including foraging within the lands. This second camera remained in place over the same time period (17th to 31st August 2022). Both cameras were examined for the times and dates of badger activity at each location to determine the level of badger activity and potential for occupancy.

7.2.2.3 Bats

The site of the Data Centre development was previously surveyed for that permitted development and a report is presented in Appendix 7.3.

A desktop assessment of the suitability of the cable routes for usage by bats was undertaken. The majority of the cable route will be trenched with no potential for effects on bats. Small sections of hedgerow may be affected and the value of these areas to roosting bats was assessed by undertaking a Preliminary Ground Based Bat Roost Survey.

The survey was undertaken following adapted guidelines from the following sources;

- Hundt L. (2012) Bat Surveys: Good Practice Guidelines, 2nd edition, Bat Conservation Trust, London
- Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

The results of the previous bat detector survey, the desk-based study and the ground based bat roost survey have informed the assessment of potential effects on bats arising from the proposed development.

7.2.2.4 Breeding Birds

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

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

Field surveys carried out in the areas of the proposed development deemed the lands to be unsuitable feeding and/or roosting sites for wintering birds, due to habitat

conditions being subject to high levels of disturbance by grazing cattle and sheep. As such it was not deemed necessary to carry out detailed wintering bird surveys in these areas. The results of the desk-based study have informed the assessment of potential impacts on wintering bird species arising from the proposed development.

7.2.3 Categorisation of the Baseline Environment

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

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

7.2.4 Assessment Methodology

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

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

- Ecological Surveying Techniques for Protected Flora & Fauna (NRA, 2008);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009);
- Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2019).

7.3 RECEIVING ENVIRONMENT

The development areas are predominately comprised of improved agricultural grassland, with associated hedgerows along with buildings and artificial surfaces, in particular roads in which the majority of the route passes. The route passes through six agricultural fields and will be passed under the Moneylane Stream and the Dublin-Rosslare rail line by means of Horizontal Directional Drilling (HDD).

The development site is drained by a series of agricultural ditches, including the Springfield Stream, which flow into the Moneylane Stream and ultimately discharge into the Avoca River. The Moneylane Stream is situated to the northwest and flows in a northerly direction. The Site is drained by a series of agricultural ditches which connect to the Moneylane Stream and ultimately discharges into the Avoca River.

The current EPA watercourse mapping shows an existing stream called Springfield within the 110 kV Substation location; however this feature is not shown in any of the old records provided within the GeoHive website. It has been determined that, this feature is likely a surface water drainage feature that has developed over time along the laneway, rather than a pre-existing natural watercourse.

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

7.3.1 Zone of Influence

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

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

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

The Zol of air quality effects is generally local to the proposed development and not greater than a distance of 50m from the proposed development boundary, and 500m from Construction Compound during the Construction Phase, and up to 200m the Proposed Development boundary during the Operational Phase.

With regards to hydrological impacts, the distances over which water-borne pollutants are likely to remain in sufficient concentrations to have a likely significant effect on receiving waters and associated wetland / terrestrial habitat is highly site-specific and related to the predicted magnitude of any potential pollution event. Evidently, it will depend on volumes of discharged waters, concentrations and types of pollutants (in this case sediment and/or hydrocarbons), volumes of receiving waters, and the ecological sensitivity of the receiving waters. In the case of the proposed development, this includes: all riverine habitats downstream of where the proposed development to which the proposed development will drain.

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

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

7.3.2 Designated Conservation Areas

A Zone of Influence (Zol) of a proposed development is also the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. In accordance with the OPR Practice Note, PN01, the Zol should be established on a case-by-case basis using the Source- Pathway-Receptor framework (see AA Screening Report Appendix 7.1).

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

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

The potential for source pathway receptor connectivity is firstly identified through GIS interrogation and detailed information is then provided on sites with connectivity. European sites that are located within a potential Zone of Influence of the Proposed Development are presented in Figure 7.2, below. Spatial boundary data on the Natura 2000 network was extracted from the NPWS website (www.npws.ie) on 14 October 2022. This data was interrogated using GIS analysis to provide mapping, distances, locations and pathways to all sites of conservation concern including pNHAs, NHA and European sites.

The nearest European sites to the Proposed Development is the Kilpatrick Sandhills SAC (Site Code 001742), approximately 4.5km to the southeast.

There is no potential for connectivity to this or any other European sites.

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

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

The NHAs and pNHAs within the zone of influence of the development will not be impacted, and no supporting habitat will be affected.

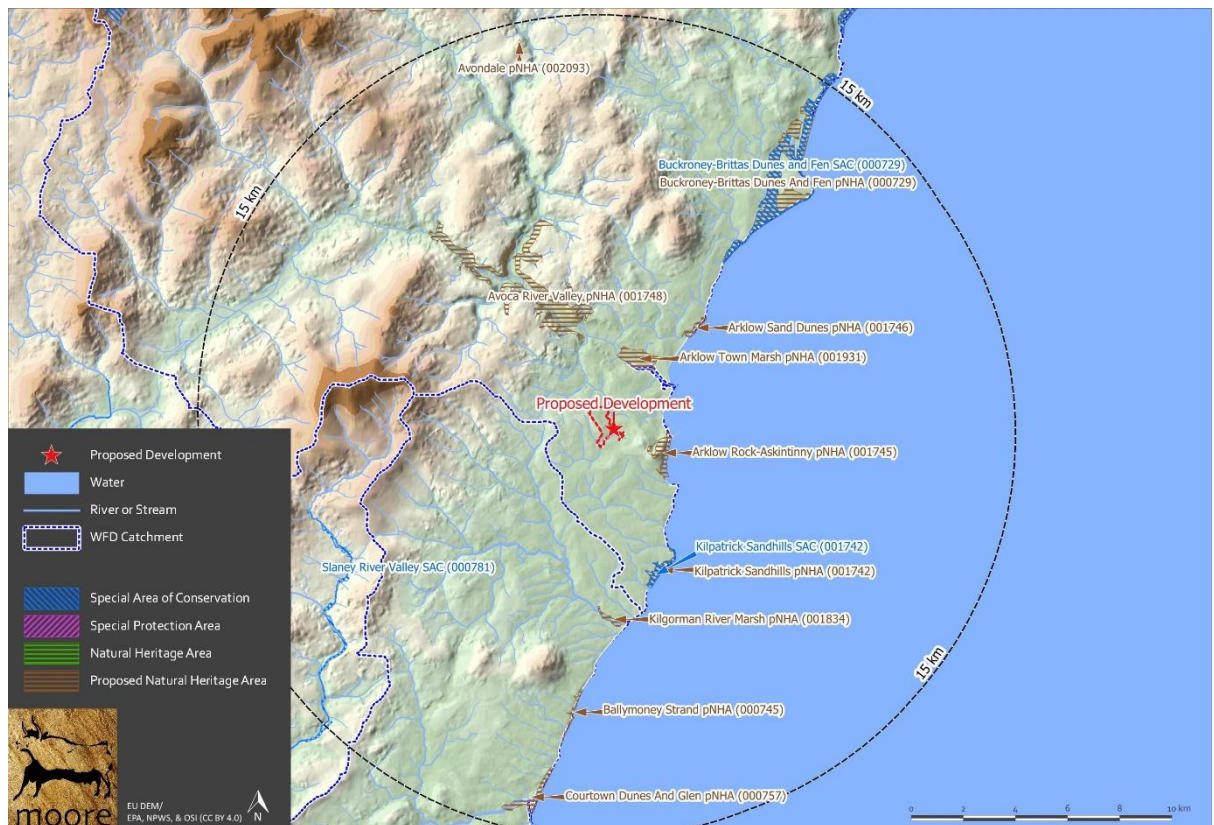


Figure 7.2 Detail of site Location in relation to nearby designated sites.

7.3.3 Habitats, Flora & Fauna

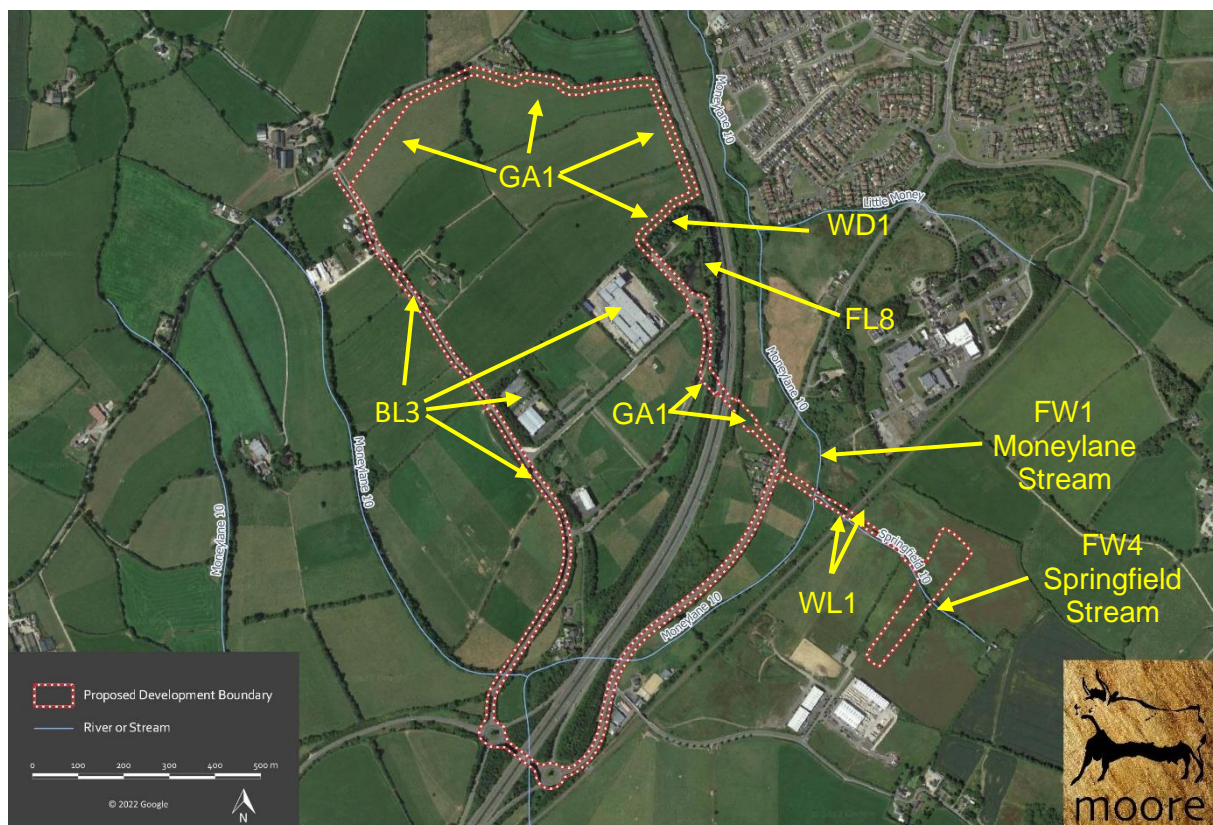
In general, there are few natural habitats in the proposed development areas. The main semi-natural habitats of conservation concern are the hedgerows crossed by the cable route. Habitats are classified under the Fossitt codes (Fossitt, 2000).

The following is an overview of the main habitat types present in proposed works areas. Detailed habitat descriptions are provided in areas that either intersect or have hydrological connectivity with European sites, see Figure 7.2.

The main habitats are presented on the recent aerial photography (April 2021) in Figure 7.3. A list of habitats recorded and their corresponding Fossitt codes is presented in Table 7.2.

Table 7.1 Details of habitats recorded and their corresponding Fossitt codes.

Habitat	Habitat Category	Habitat Type
(F) Freshwater	(FL) Lakes and Ponds	(FL8) Artificial lake
	(FW) Watercourses	(FW1) Streams
		(FW4) Drainage Ditches
(G) Grassland	(GA) Improved grassland	(GA1) Improved agricultural grassland
(W) Woodland and Scrub	(WD) Highly modified/non-native woodland	(WD1) Mixed broad leaved woodland
	(WL) Linear woodland	(WL1) Hedgerows
(B) Cultivated and Built Land	(B) Built Land	(BL3) Buildings and Artificial Surfaces

**Figure 7.3** Habitats recorded at the proposed development site at Kish.

7.3.3.1 FW1 Streams

The Moneylane Stream drains the land between the Motorway and the Railway. Species recorded included Angelica (*Angelica sylvestris*), Water Cress (*Nasturtium officinale*), Great Willowherb (*Epilobium hirsutum*) and Tufted Forget-me not (*Myosotis laxa*). The Moneylane Stream is culverted in part and will be under passed by HDD and not affected by the proposed development.

7.3.3.2 FW4 Drainage Ditches

The Springfield Stream is a drainage ditch which runs parallel to the route of the Cable. Species recorded included Angelica (*Angelica sylvestris*), Water Cress (*Nasturtium officinale*), Great Willowherb (*Epilobium hirsutum*) and Tufted Forget-me not (*Myosotis laxa*), flowing into the Moneylane Stream.

7.3.3.3 (FL8) Other artificial lakes and ponds

An attenuation pond for the Arklow Business Park is situated outside the route boundary, but adjacent to the private road along which it will pass; this contained stands of Great Reedmace (*Typha latifolia*), Common Reed (*Phragmites australis*) and Common Club Rush (*Schoenoplectus lacustris*)

7.3.3.4 (GA1) Improved Agricultural grassland

This habitat is found principally southeast of the M11 motorway, where the 110 kV Substation is to be constructed, and along the Cable route as far as the motorway. Several large fields, grazed by cattle and sheep, and bounded by hedgerows are comprised entirely of this habitat. Species recorded here include Perennial Rye Grass (*Lolium perenne*), Meadow Buttercup (*Ranunculus acris*), Spear Thistle (*Cirsium vulgare*), Creeping Thistle (*Cirsium arvense*), White Clover (*Trifolium repens*), Creeping Bent (*Agrostis stolonifera*) and Ribwort Plantain (*Plantago lanceolata*). The southeasternmost portion of grassland is slightly wetter, with occasional Soft Rush (*Juncus effusus*).

The habitat was also recorded in the northwestern section of Cable Route, where the cable enters a field to intersect with the existing electricity infrastructure.

7.3.3.5 (WD1) Mixed broad leaved woodland

An area at the northern end of the IDA Arklow Business Park, through which the cable route passes, contains a mix of fast growing native and non-native trees including Grey Willow (*Salix cinerea*), Poplar (*Populus* sp.) Ornamental Cherry (*Prunus* sp.), Dogwood (*Cornus* sp) and Sycamore (*Acer pseudoplatanus*).

7.3.3.6 (WL1) Hedgerow

This habitat is frequent in wider area, including bordering the cable route as it passes along public roads. Those areas of this habitat which are within the direct footprint of the development are the hedgerows bordering the Springfield Stream, the hedgerows running along and adjacent to the railway line, and the hedgerows in the north of the site which are crossed by the cable route as it enters and leaves the agricultural fields. With the exception of the Springfield Stream hedgerow, these are short sections of hedgerow. The species in the hedgerows were typical of with Hawthorn (*Crataegus monogyna*), Elder (*Sambucus nigra*) and Blackthorn (*Prunus spinosa*) dominating. Occasional Ash (*Fraxinus excelsior*) rose above the hedgeline. Rose (*Rosa canina* agg), Bramble (*Rubus fruticosus*) and Ivy (*Hedera hibernica*) were very frequent, with species tolerant of nutrient enrichment including Nettle (*Urtica dioica*), Spear Thistle (*Cirsium vulgare*), Hogweed (*Heracleum sphondylium*) and Wood Avens (*Geum urbanum*) present also.

7.3.3.4 BL3 Buildings and Artificial Surfaces

Most of the roads along which the cable is routed were classified as Buildings and Artificial Surfaces, and were entirely free of vegetation.

7.3.4 Invasive Species

There were no invasive species recorded during the habitat survey.

7.3.5 Fauna

7.3.5.1 Badgers

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

The Badger Survey Report compiled by Brian Keeley is presented as Appendix 7.2. There is a single entrance badger sett within the lands proposed for developing the Permitted ICT Facility (there is the potential of a second entrance but this does not appear to be fully developed). The trail cameras revealed the appearance of badgers over the two years of survey; 2020 and 2022.

In June 2020, there was a visit to the sett of a badger on 17th June at 02.25 hours but the badger did not emerge from or return to the sett (i.e. the badger visited the sett, examined the outside of the sett but continued past it following these explorations). The time of arrival also suggests that the badger has been commuting over a distance before it reaches the sett and has not recently emerged from a sett; most importantly from the sett under examination in this assessment.

The camera footage indicated that there was a rat in residence in 2020 and also a rat present / resident in 2022. Further surveying in the adjoining lands provided no substantial evidence of badgers and there were no setts in the remaining proposed development area.

In August 2022, there was again no evidence of occupancy of the sett, this time with an observation period of approximately 2 weeks. A badger was recorded at 01.40 hours on 20th August 2022. This was more than one day after the camera was set up. The presence at 01.40 hours suggests that the badger had travelled a distance to reach the sett and had not emerged from it. On the second camera, one badger was recorded at 02.28 hours on 18th August 2022 and at no other time. There is clearly badger activity within the site but this does not appear to be very high. While there was evidence of mammal movement in the site, it is difficult to ascertain the species concerned as there is considerable sheep activity within the site. Tracks into scrub could as easily indicate fox movements as badger movements.

There were no badger paw prints identified, no badger latrines or snuffle holes.

By definition, the sett cannot be considered a main sett and given that there were no setts found connected to the sett, the sett can be considered an outlier sett. The sett is used intermittently by a badger social group and may lie towards the edge of the territory. The entrance is clear of obstructions and there is some evidence of bedding having been brought to the sett by badgers.

It is clear that badgers pass through the lands while foraging as there can be a considerable range for an adult badger.

7.3.5.2 Otters

There is a record of an otter in Arklow on the Avoca River from 09/02/15. While this river and some of its larger tributaries likely provide suitable habitat, the watercourses in the study area are either largely culverted or heavily overgrown with vegetation. In any case the Moneylane Stream will be under-passed by HDD removing the potential for effects on otters.

7.3.5.3 Bats

Results from the NBDC database for the 2km square T27F in which the proposed development is located returned three records of bats including: Brown Long-eared Bat (*Plecotus auritus*); Lesser Noctule (*Nyctalus leisleri*) and Pipistrelle (*Pipistrellus pipistrellus sensu lato*) recorded between 2005 and 2008.

The previous bat surveys (May & June 2020) showed very low bat activity. The surveyor was based by the derelict dwellings waiting for emerging bats from the start of survey until 22:45. This area was sheltered with low wind conditions. No bat activity occurred in this period.

The surveyor completed looped transects of the treelines and hedgerows within the site. On 22 May 2020 at 23:12 a brief unseen *Myotis* species was recorded by the hedgerow to the north-east of the former farm buildings. A similar call was recorded at 23:26 by the treelines at the site entrance. The dawn survey was primarily based by the buildings examining for bats returning to roosts. No bats were recorded.

Similar to the previous survey activity within the site was very low on 9 June 2020. The surveyor was again based by the derelict farmstead during the emergence period. The first recorded registration occurred at 22:26 some 36 minutes after sunset when a Leisler's bat (*Nyctalus leisleri*) was briefly recorded by the sheds. This species is the earliest bat to emerge often found flying at sunset. At 23:44 a brief Common Pipistrelle (*Pipistrellus pipistrellus*) was also recorded close to here. The final registration occurred at 00:15 along the central hedgerow bisecting the entrance path when a Common Pipistrelle was noted feeding. The dawn survey took place based by the bridge to the north of the site. At 04:04 a Common Pipistrelle was recorded flying while at 04:25 both Common Pipistrelle and a Leisler's bat were recorded. This was the last sighting and occurred 33 minutes prior to dawn. No roosting behaviour was noted by the railway bridge.

During the 17 June 2020 survey, four bat species were recorded; Common Pipistrelle, Soprano Pipistrelle, Nathusius Pipistrelle and Leisler's Bat. The first recording was from a very brief unseen Leisler's at 22:19 24 minutes after sunset by the farm buildings. At 22:34 a Nathusius Pipistrelle was observed hunting along the hedgerow adjacent to the farmstead until 22:40. This species is noticeably larger than other Irish Pipistrelle's and had a peak frequency of 40kHz. At 22:37 a Common Pipistrelle was noted, followed by a Soprano Pipistrelle bat flying along hedgerows near the derelict dwelling.

Sporadic sighting occurred during the transect walks of the site with a Soprano Pipistrelle recorded flying to the east of the site by the boundary hedgerow.

The dawn survey took place based by the mature oak tree by the central hedgerow that bisects the pathway into the site. Several recordings from Leisler's bats were recorded here with one call at 04:30 showing two bats. The final bat pass occurred at 04:37 some 19 minutes before sunrise. This bat flew in a southerly direction off site.

Some mature trees along hedgerows may be removed along the cable routes, but no notable veteran trees were noted during the survey and no bat roosts are likely to be disturbed.

7.3.5.4 Birds

Species recorded included regular passerines such as Goldfinch (*Carduelis carduelis*), Blackbird (*Turdus merula*) and Wren (*Troglodytes troglodytes*).

A list of breeding bird species recorded during fieldwork in August 2022 is presented in Table 7.4.

Table 7.2 Details of birds encountered during fieldwork.

Birds	Scientific name	BWI Status	Habitat Type
House Sparrow	<i>Passer domesticus</i>	Amber	Houses, farms, hedgerows
Goldfinch	<i>Carduelis carduelis</i>	Green	Hedgerows, gardens, meadows
Wren	<i>Troglodytes troglodytes</i>	Green	Hedgerows, scrub, woods, gardens, ubiquitous
Blackbird	<i>Turdus merula</i>	Green	Dense woodland to open moorland, common in gardens
Woodpigeon	<i>Columba palumbus</i>	Green	Gardens, woods, hedges
Magpie	<i>Pica pica</i>	Green	Farmland, open country with scattered trees or bushes, increasingly in urban areas
Rook	<i>Corvus frugilegus</i>	Green	All terrestrial habitats
Chiffchaff	<i>Phylloscopus collybita</i>	Green	Woodland, mature hedgerows

7.3.6 Habitat Evaluation

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

Ecological valuation: Examples

International Importance:

- 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
- Site that fulfills the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
- Features essential to maintaining the coherence of the Natura 2000 Network.
- Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
- Resident or regularly occurring populations (assessed to be important at the national level) of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
- Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).

- World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
- Biosphere Reserve (UNESCO Man & The Biosphere Programme).
- Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
- Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
- Biogenetic Reserve under the Council of Europe.
- European Diploma Site under the Council of Europe.
- Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).

National Importance:

- Site designated or proposed as a Natural Heritage Area (NHA).
- Statutory Nature Reserve.
- Refuge for Fauna and Flora protected under the Wildlife Acts.
- National Park.
- Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA);
- Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
- Resident or regularly occurring populations (assessed to be important at the national level) of the following:
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive
- County Importance:
 - Area of Special Amenity.
 - Area subject to a Tree Preservation Order.
 - Area of High Amenity, or equivalent, designated under the County Development Plan.
- Resident or regularly occurring populations (assessed to be important at the County level) of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.

- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):

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

Local Importance (lower value):

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

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

Agricultural parts of the site are drained at present by ditches, including the Springfield Stream and the Moneylane Stream; these discharge into the Avoca River.

There are no pathways from the development site to any European sites. There are no predicted effects from the construction phase.

Surface water will be directed to a new permanent attenuation treatment system. There are no predicted effects from the operational phase.

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

7.4 CHARACTERISTICS OF THE DEVELOPMENT

The Proposed Development consists of the construction and operation of a Grid Connection for a data storage facility at Kish, Arklow, Co. Wicklow.

The Proposed Development consists of three main components; the 110 kV Substation Site, Circuit Route A and Circuit Route B, which are described below.

110kV Gas Insulated Switchgear (GIS) Substation

Construction of a 2 storey 110kV Gas Insulated Switchgear (GIS) Substation, to be located on lands at Kish and Boglands, to the south of Arklow, County Wicklow. This comprises a 110 kV Substation building that includes cable room, battery room, relay room, stair cores and circulation areas and welfare facilities, with an overall height of c. 14.5m, a Client Control Building, and site infrastructure including 4 no. transformer bays, fire walls (c. 10 m high), drainage works, all internal road/footpath access routes, landscaping and boundary treatment works, vehicular access, and provision of 8 no. car parking spaces in the overall compound. The proposed 110 kV Substation will serve the ICT Facility permitted under WCC Reg. Ref.: 201088.

Cable Circuits and New Masts

The underground cable (Cable Circuit A) is a single circuit 110 kV cable and communications ducts and 5 joint bays that will follow a liner route of 2,888 m; originating at the proposed 110 kV Substation and terminating at the existing 110 kV Arklow – Banoge overhead line. The 2,888 m route can be summarised as approximately:

- extending to the north-west c. 434 m from the proposed 110 kV Substation including a 103 m horizontal directional drilling (HDD) crossing under the Dublin-Rosslare rail line via.
- c. 800 m in the existing carriageway ducting along the R772 to the M11 Junction 21
- c. 300 m in carriageway through the M11 Junction 21
- Proceeding to the northwest c. 1,400 m in the existing carriageway along the L6187.
- At the terminus the cable connects to the existing 110 kV Arklow – Banoge overhead line via a proposed c. 17 m above ground level lattice mast adjacent to Knockeneahan Road (L2190).

The underground cable (Cable Circuit B) is a single circuit 110 kV cable and communications ducts and 4 joint bays that will follow a liner route of 2,164 m; originating at the proposed 110 kV Substation and terminating at the existing 110 kV Arklow – Banoge overhead line. The 2,164 m route can be summarised as approximately:

- extending to the north-west c. 416 m from the proposed 110 kV Substation including a 103 m horizontal directional drilling (HDD) crossing under the Dublin-Rosslare rail line via.
- 158 m in farmland crossing, and carriageway ducting along the R772
- 142 m under the M11 via HDD
- 600 m in private road (IDA), and future development lands (IDA)
- 900 m in farmland
- At the terminus the cable connects to the existing 110 kV Arklow – Banoge overhead line via a proposed c. 17 m above ground level lattice mast adjacent to Knockeneahan Road (L2190).

During construction, a temporary access will be established for the 110 kV Substation from the Kish Business Park Road terminus at the western site of the site. It is proposed

that the accesses and haul roads for vehicles, the contractors' compound and fencing will be utilised for all development on the main site.

It is proposed that during operation, the 110kV Substation will be accessed via controlled entry on the permitted inner relief road under WCC Reg. Ref. 201088, from the Kish Business Park road terminus at the western site of the site. This road will be adjacent to Armstrong Engineering and accessed via Clogga Road.

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

7.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

7.5.1 Construction Phase

7.5.1.1 Habitats

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

There will be a minor loss of highly modified non- native woodland in the Arklow Business Park habitats of low local value. The overall area affected is c. 100m². The potential effects on local ecology are **neutral** and **imperceptible** for the construction phase.

There would be a permanent loss of c. 20m of internal hedgerow in four sections to facilitate the cable route through agricultural land, and c. 150m of hedgerow along the Springfield Stream. The hedgerow is considered high value on a local level. The potential effects on local ecology are **negative** but **not significant** for the construction phase.

The Moneylane Stream will be under-passed by HDD avoiding any potential effects on water quality.

There will be no effect on the adjacent landscaped attenuation pond at Arklow Business Park.

There are no pathways from the development areas to the any European sites.

Surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction.

7.5.1.2 Fauna

Badgers

There were no badger setts along field boundaries which would be disturbed and no signs of badgers under the footprint of the cable routes.

There is a Permitted ICT Facility and the Proposed 110 kV Substation buildings proposed for the site, that will result insubstantial modifications to the fencing and access to the site. These changes will result in the following:

Loss of a sett

There will be a loss of the existing sett (an outlier sett of a badger social group presumably in neighbouring lands). The removal of a sett may affect the survival of a social group in the area if there are not suitable locations within which a badger may establish an alternative sett. It is probable that there are several setts in the surrounding area. This may be a **long-term moderate negative** effect on badgers.

Loss of commuting corridor

There will be a loss of vegetation and the construction of buildings and units as part of the current project that may affect commuting badgers by removing cover that allows commuting in an unlit area. There will be an increase in the fencing around the site and this would affect the ability of badgers to move through the area.

Loss of feeding area

This will reduce feeding for badgers by reducing the hedgerow cover, shelter and substrate for invertebrates. This would be a **long-term moderate negative** effect.

Otters

There were no signs of otters and no suitable habitats for otters in the proposed development area. There is no potential for effects on otters.

Bats

The permitted ICT development of this site involves the removal of treelines and hedgerows that represent landscape features used primarily by Pipistrelle species and Leisler's bats. No evidence of commuting bats was noted from the survey. Given the amount of hedgerow features located in the surroundings the loss of the internal treelines and hedgerows will result in a low level permanent reduction of this habitat for local bat populations.

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

Birds

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

7.5.2 Operational Phase

7.5.2.1 Habitats

There are no pathways from the development areas to the any European sites.

Surface water will be directed to a permanent attenuation pond. There are no predicted effects from the operational phase.

7.5.2.2 Fauna

Badgers

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

Otters

Surface water will be directed to existing site drainage which is attenuated and Wastewater will be directed to the onsite treatment plant. There is no potential for effects on otters or sources of food during the operational phase.

Bats

Guidance on lighting is based on the Bats & Lighting document; (BCI 20, the Bats and artificial lighting in the UK Guidance Note 08/18 (BCT, 2018) and Guidelines for consideration of bats in lighting projects. EUROBATS Publication Series No. 8 (Voigt, 2018). Lighting can alter the behaviour of bats and the insects they prey on. The potential effect on bats from lighting relates to avoidance of feeding habitat.

Given the relatively low potential for bat commuting in an area of intensive agriculture, and the undergrounding of most of the development, the predicted effect on bats is not significant for the operational phase.

Birds

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

7.6 MITIGATION MEASURES

Potential impacts on birds will be avoided by cutting of vegetation outside the bird nesting season March 1st to August 31st.

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

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

Exclusion of the badger sett

NPWS advise that the receipt of planning approval is sufficient to allow the exclusion of a badger sett undertaken in a planned and careful process that avoids injury or death of badgers in the process. The exclusion procedure must be acceptable to NPWS and implemented by a badger specialist. Exclusion must not be undertaken if there is the possibility of badger cubs, and this would rule out the months December to July unless it has been proven that sett is not a main sett or breeding sett.

Exclusion shall require the use of badger gates and mesh and may require up to 3 weeks to complete in most circumstances.

The sett shall be monitored by the installation of a camera to monitor the sett prior to the erection of a one-way gate to prevent badger entry (or re-entry).

NPWS shall be advised of the commencement of procedures and of the outcome of procedures. Where there is any question of risk to badgers, NPWS must be contacted immediately.

Construction of artificial badger sett within the site

It is proposed that a two-chambered badger sett is constructed within the site to provide an alternative to the sett removed for the proposed development. The sett shall have chambers constructed using concrete slabs with either concrete or breeze blocks or alternatively wood and plastic. Use of 900 mm x 600 mm concrete paving slabs associated with 150 mm bed concrete or alternatively timber chambers may be constructed from marine ply.

Pipes between chambers and leading to the outside may be of twinned walled drainage pipe.

The proposed design and location is presented in detail in the attached report in Appendix 7.2.

Badger accessible fencing surrounding the site

Fencing around the site could prevent human / livestock / canine access to the entire site while allowing badger access by providing a number of access points with the following specifications:

There shall be three access areas along the northern fence to allow badger entry, These shall be by means of 300mm pipes that shall pass under the perimeter fence and into the ground and re-emerge from the ground on each side of the fence. Pipes need not exceed 4 metres in length to allow badger entry and prevent humans and livestock, Locations for access areas are shown by black bars in the figure provided I Appendix 7.2.

7.7 RESIDUAL IMPACTS OF THE DEVELOPMENT

Specific local mitigation measures include the avoidance of cutting of vegetation during the bird nesting season with regard to the construction phase. There will be a loss of relatively low value local habitats including sections of hedgerow up to -170m, grassland and c. 100m² non-native woodland. The remaining hedgerow habitat to be conserved in site is c. 100m in length. The overall effect is considered ***neutral, imperceptible, and long-term.***

With the employment of appropriate mitigation measures with regard to local biodiversity, the Proposed Development will have a ***neutral, imperceptible and long-term effect*** on biodiversity.

There will be a long-term loss of badger dwelling places in the area and a reduction in feeding and commuting. This may affect a badger social group over a sustained period (e.g., years to decades). It is improbable that this would affect the conservation status of badgers in the Wicklow / Wexford area.

7.8 MONITORING

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

No reinstatement measures are proposed.

7.9 CUMULATIVE IMPACTS

The potential for cumulative impact (as far as practically possible) of the Proposed Development with any/all relevant planned, existing or permitted developments as set out in Chapter 2, Section 2.8 and 2.9 of the EIAR, unless otherwise stated. The likelihood of cumulative effects are discussed

7.9.1 Construction Phase

In relation to the potential cumulative impact on the biodiversity during the construction phases, those key engineering works which could result in cumulative impact if not adequately mitigated include:

- Contamination of surface water (Moneylane Stream) from accidental spillage and leakage from construction traffic and construction materials may occur unless project-specific mitigation measures implemented via a Construction Environmental Management Plans (CEMPs) are put in place. A project-specific CEMP's will be implemented for the Proposed Development.
- The cable routes will require the cutting of terminal hedgerow vegetation. Measures for the protection of nesting birds are included to avoid effects in this regard.

There is a direct pathway from the site to the Moneylane Stream via over land flow that will require appropriate management. The permitted development WCC Reg. Ref. 20/1088 includes for the removal, infilling and redirection of the existing agricultural ditches that currently drain the site. Surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction.

All run-off will be prevented from directly entering into the existing water courses and drainage ditches. The proposed mitigation measures set out in Chapter 6, Section 6.6 along with implementations of the Permitted ICT Facilities planning conditions will ensure there are no significant cumulative effects.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified the only simultaneous construction projects capable of combining with the Permitted Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed Development to combine with the construction phase of the Biofuel Facility proposed under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

Permitted ICT Facility WCC Reg. Ref. 20/1088; is subject to the Environmental Impact Assessment Report and planning conditions which include appropriate mitigation measures to minimise environmental impacts. Furthermore, Condition 8 of WCC Reg. Ref. 20/1088 requires the works contractor to provide a detailed Construction Environmental Management Plan (CEMP) for the Permitted ICT Facility. The CEMP for the Permitted ICT Facility will ensure that this project will be managed in a safe and organised manner by the Contractor. While there is the potential for cumulative impacts between the Proposed Development and the Permitted ICT Facility during a simultaneous construction phase; the effect is considered to be **neutral**,

imperceptible, and **temporary** in duration (due to the duration of the construction works of the Proposed Development lasting no more than 12 months).

The proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181 is similarly; subject to an Environmental Impact Assessment Report which includes appropriate mitigation measures to minimise environmental impacts. The proposed Biofuel Facility application included an outline Construction Management Plan (CMP). The CMP for the proposed Biofuel Facility will ensure that this project will be managed in a safe and organised manner by the Contractor. While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during a simultaneous construction phase; the effect is considered to be **neutral, imperceptible**, and **temporary** in duration (due to the duration of the construction works of the Proposed Development and the proposed Biofuel Facility lasting no more than 12 months).

AWN Consulting and the project team have prepared a *Construction & Environmental Management Plan (CEMP)* (2022) that will be adhered to in full. This outlines and explains the construction techniques and methodologies which will be implemented during construction of the Proposed Development.

Overall there will be no significant cumulative impact to biodiversity from the Proposed Development in combination with the Permitted ICT Facility, and the proposed Biofuel Facility.

With the implementation of mitigation measures the residual cumulative effect on biodiversity of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be **neutral, imperceptible**, and **temporary** in duration (due to the duration of the construction works of the Proposed Development lasting no more than 12 months).

7.9.2 Operational Phase

In relation to the potential cumulative impacts from the operational stages, the following could result in a cumulative impact if not adequately mitigated:

- Accidental releases from fuel storage/unloading could contaminate surface water environments.
- the Proposed Development, the Permitted ICT Facility, and the proposed Biofuel Facility could result in the permanent loss of feeding habitat for badgers if not mitigated through design.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified the only simultaneous projects capable of combining with the Permitted Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed Development to combine with the operational phase of the proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

The Permitted Development has been designed in conjunction with the Permitted ICT Facility WCC Reg. Ref. 20/1088 to as a singular project to include a comprehensive landscaping strategy. Once operational, the Permitted ICT Facility and Proposed Development landscape strategy for the project will enhance and strengthen the existing native floral species, while retaining the existing trees remaining hedgerow.

With the implementation of mitigation measures the residual cumulative effect on biodiversity of the Proposed Development in combination with other relevant planned, existing or permitted developments during operation is considered to be **negative, moderate, and medium-term** in duration, changing to **neutral, imperceptible, and long-term** as the landscaping for the proposed development and permitted developments is established.

7.10 REFERENCES

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8.0 AIR QUALITY AND CLIMATE

8.1 INTRODUCTION

This chapter evaluates the likely significant impacts in which the Proposed Development may have on Air Quality and Climate as defined in the Environmental Protection Agency (EPA) documents 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2022) and the EPA Draft 'Advice Notes for Preparing Environmental Impact Statements' (2015).

8.2 METHODOLOGY

8.2.1 Criteria for Rating of Impacts

8.2.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, National and European statutory bodies, the Department of the Environment, Heritage and Local Government in Ireland and the European Parliament and Council of the European Union, have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed based on compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporate European Commission Directive 2008/50/EC, which has set limit values for numerous pollutants with the limit values for NO₂, PM₁₀, and PM_{2.5} being relevant to this assessment. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC) and includes ambient limit values relating to PM_{2.5}. The applicable limit values for NO₂, PM₁₀, and PM_{2.5} are set out in Table 8.1.

Table 8.1 Ambient Air Quality Standards

Pollutant	Regulation ^{Note 1}	Limit Type	Value
Dust Deposition	TA Luft (German VDI 2002)	Annual average limit for nuisance dust	350 mg/(m ² *day)
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m ³
		Annual limit for protection of human health	40 µg/m ³
Particulate Matter (as PM ₁₀)	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m ³ PM ₁₀
		Annual limit for protection of human health	40 µg/m ³ PM ₁₀
Particulate Matter (as PM _{2.5})	2008/50/EC	Annual limit for protection of human health	25 µg/m ³ PM _{2.5}

Note 1 EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

8.2.1.2 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust, which are less than 10 microns, and the EU ambient air quality standards outlined in Section 8.2.1.1 have set ambient air quality limit values for PM₁₀ and PM_{2.5}.

With regard to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland.

However, guidelines for dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/(m²*day) averaged over a one-year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled 'Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (EPA, 2006). The document recommends that the TA-Luft limit of 350 mg/(m²*day) be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the Proposed Development.

8.2.1.3 Climate Agreements

Ireland is party to both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The Paris Agreement, which entered into force in 2016, is an important milestone in terms of international climate change agreements and includes an aim of limiting global temperature increases to no more than 2°C above pre-industrial levels with efforts to limit this rise to 1.5°C. The aim is to limit global GHG emissions to 40 gigatonnes as soon as possible whilst acknowledging that peaking of GHG emissions will take longer for developing countries. Contributions to

GHG emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant progress was also made in the Paris Agreement on elevating adaptation onto the same level as action to cut and curb emissions.

In order to meet the commitments under the Paris Agreement, the EU enacted *Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013* (the Regulation). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. Ireland's obligation under the Regulation is a 30% reduction in non-ETS greenhouse gas emissions by 2030 relative to its 2005 levels.

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the Act). The purpose of the Act was to enable Ireland 'to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050' (3.(1) of No. 46 of 2015). This is referred to in the Act as the 'national transition objective'. The Act made provision for, *inter alia*, a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019a). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second Climate Action Plan in November 2021 (Government of Ireland, 2021a). The plan contains similar elements as the 2019 CAP and aims to set out how Ireland can reduce our greenhouse gas emissions by 51% by 2030 (compared to 2018 levels) which is in line with the EU ambitions, and a longer-term goal of achieving net-zero emissions no later than 2050. The 2021 CAP outlines that emissions from the Built Environment sector must be reduced to 4 - 5 MtCO_{2e} by 2030 in order to meet our climate targets. This will require further measures in addition to those committed to in the 2019 CAP. This will include phasing out the use of fossil fuels for the space and water heating of buildings, improving the fabric and energy of our buildings, and promoting the use of lower carbon alternatives in construction.

Following on from Ireland declaring a climate and biodiversity emergency in May 2019 and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme for the Climate Action (Amendment) Bill 2019 in December 2019 (Government of Ireland 2019b) followed by the publication of the Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021) (hereafter referred to as the 2021 Climate Act) in July 2021 (Government of Ireland, 2021b). The 2021 Climate Act was prepared for the purposes of giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act is to provide for the approval of plans ‘for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050’. The 2021 Climate Act will also ‘provide for carbon budgets and a decarbonisation target range for certain sectors of the economy’. The 2021 Climate Act defines the carbon budget as ‘the total amount of greenhouse gas emissions that are permitted during the budget period’. The 2021 Climate Act removes any reference to a national mitigation plan and instead refers to both the Climate Action Plan, as published in 2019, and a series of National Long Term Climate Action Strategies. In addition, the Environment Minister shall request each local authority to make a ‘local authority climate action plan’ lasting five years and to specify the mitigation measures and the adaptation measures to be adopted by the local authority.

In relation to carbon budgets, the Climate Action and Low Carbon Development (Amendment) Act states ‘A carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a ‘budget period’). The carbon budget is to be produced for 3 sequential budget periods, as shown in Table 8.2. The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of GHG emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors. The sectoral emission ceilings for 2030 were published July in 2022 and are shown in Table 8.3. Industry has a 35% reduction required and emissions ceiling of 4,000ktCO₂e.

Table 8.2 5-Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2025 (Department of the Taoiseach 2022)

Sector	Reduction Required	2018 Emissions (MtCO ₂ e)
2021-2025	295 Mt CO ₂ eq	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO ₂ eq	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO ₂ eq	Reduction in emissions of 3.5% per annum for the third provisional budget.

Table 8.3 Sectoral Emission Ceiling 2030 (Department of the Taoiseach 2022)

Sector	Reduction Required	2018 Emissions (MtCO ₂ e)	2030 Emission Ceiling (MtCO ₂ e)
Electricity	75%	10.5	3
Transport	50%	12	6
Buildings (Commercial and Public)	45%	2	1
Buildings (Residential)	40%	7	4
Industry	35%	7	4
Agriculture	25%	23	17.25

Sector	Reduction Required	2018 Emissions (MtCO ₂ e)	2030 Emission Ceiling (MtCO ₂ e)
Other**	50%	2	1

8.2.2 Construction Phase

8.2.2.1 Air Quality

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2014) outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development in order to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. The use of UK guidance is considered best practice in the absence of applicable Irish guidance.

The major dust generating activities are divided into four types within the IAQM guidance (2014) to reflect their different potential impacts. These are: -

- Demolition.
- Earthworks.
- Construction.
- Trackout (movement of heavy vehicles).

The magnitude of each of the four categories is divided into Large, Medium or Small scale depending on the nature of the activities involved. The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site-specific mitigation to be determined.

Construction phase traffic also has the potential to impact air quality and climate. The UK DMRB guidance (UK Highways Agency, 2019a), states that road links meeting one or more of the following criteria can be defined as being 'affected' by a Proposed Development and should be included in the local air quality assessment. The use of the UK guidance is recommended by the TII (2011) in the absence of specific Irish guidance, this approach is considered best practice and can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- A change in speed band;
- A change in carriageway alignment by 5m or greater.

The construction stage traffic will not increase by 1,000 AADT or 200 HDV AADT and therefore does not meet the above scoping criteria. As a result a detailed air assessment of construction stage traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to air quality.

8.2.2.2 Climate

Ireland has annual GHG targets which are set at an EU level and need to be complied with in order to reduce the impact of climate change. Impacts to climate as a result of GHG emissions are assessed against the targets set out by the EU under *Regulation*

(EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013, which has set a target of 30% reduction in non-ETS sector GHG emissions by 2030 relative to 2005 levels.

As per the EU guidance document *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) the climate baseline is first established with reference to EPA data on annual GHG emissions (see Section 8.3.4). The impact of the Proposed Development on climate is determined in relation to this baseline. The UK Highways Agency has published an updated DMRB guidance document in relation to climate impact assessments, *LA 114 Climate* (UK Highways Agency 2019b). The scoping criteria therein are used to determine whether a detailed climate assessment is required for a proposed project during the construction stage based on a potential greater than 1% change in emissions from the baseline scenario. If emissions will not increase by over 1% then no further assessment is required as there is no potential for significant impacts to climate. The construction stage activities and potential for GHG emissions have been reviewed as part of the construction stage climate assessment and a qualitative assessment conducted.

8.2.3 Operational Phase

8.2.3.1 Air Quality

Operational phase traffic has the potential to impact local air quality as a result of increased vehicle movements associated with the Proposed Development. The UK Highways Agency DMRB scoping criteria detailed in Section 8.2.2.1 was used to determine if any road links are affected by the Proposed Development and require inclusion in a detailed air dispersion modelling assessment. Due to the nature of the Proposed Development there will be minimal vehicles accessing the site during the operational phase. The Proposed Development will not increase traffic by 1,000 AADT or 200 HDV AADT. In addition, there are no proposed changes to the traffic speeds or road alignment. Therefore, no road links impacted by the Proposed Development satisfy the screening criteria (see Section 8.2.2.1) and a quantitative assessment of the impact of traffic emissions on ambient air quality is not necessary as there is no potential for significant impacts to local air quality.

8.2.3.2 Climate

Emissions from road traffic associated with the Proposed Development have the potential to emit carbon dioxide (CO₂) which will impact climate. The UK Highways Agency has published an updated DMRB guidance document in relation to climate impact assessments *LA 114 Climate* (UK Highways Agency 2019b). The following scoping criteria are used to determine whether a detailed climate assessment is required for a proposed project during the operational stage. If any of the road links impacted by the Proposed Development meet or exceed the below criteria, then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy-duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

None of the road links impacted by the Proposed Development meet the scoping criteria above and therefore a detailed assessment has been scoped out as there is no potential for significant impacts to climate.

8.3 RECEIVING ENVIRONMENT

8.3.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions where pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM₁₀, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than PM_{2.5}) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles (PM_{2.5} - PM₁₀) will actually increase at higher wind speeds. Thus, measured levels of PM₁₀ will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Dublin Airport meteorological station, which is located approximately 71 km north of the site. Dublin Airport met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 8.1). For data collated during five representative years (2017 – 2021) (Met Eireann, 2022), the predominant wind direction is westerly to south-westerly, with generally moderate wind speeds averaging 5.3 m/s for the period 1981 - 2010.

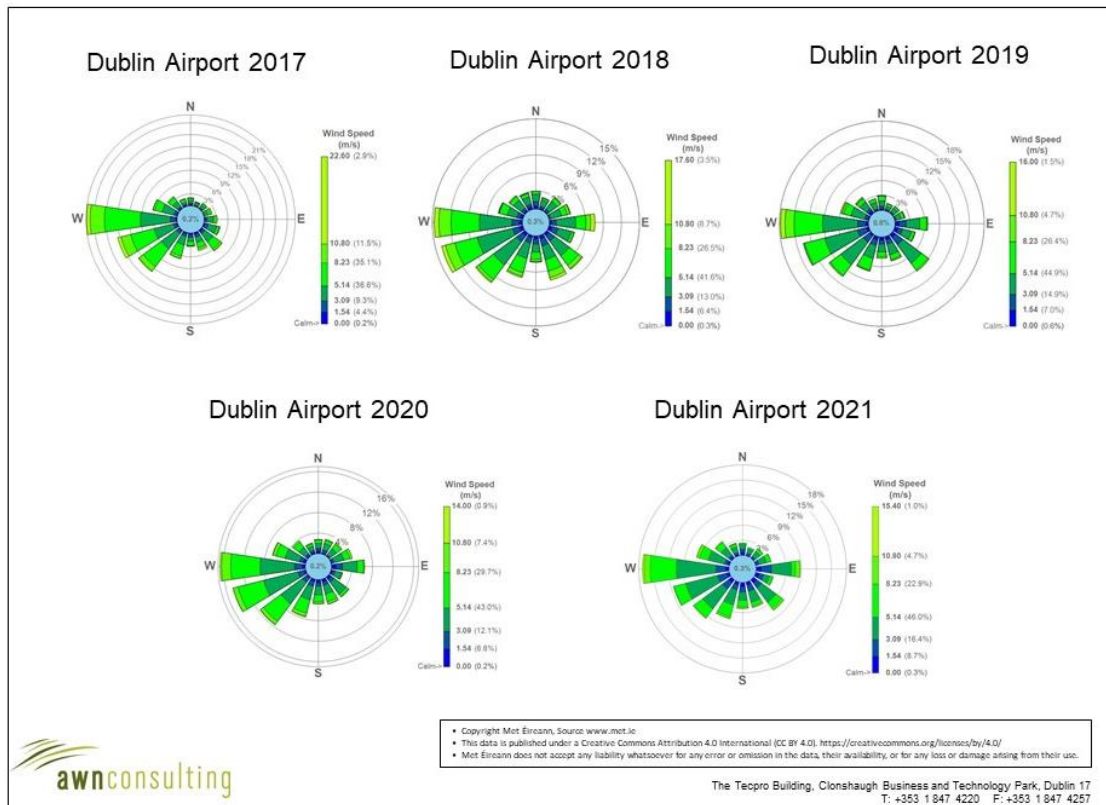


Figure 8.1 Dublin Airport Windroses 2017 - 2021

8.3.2 Baseline Air Quality

The EPA and Local Authorities have undertaken air quality monitoring programs in recent years. The most recent EPA published annual report on air quality “*Air Quality In Ireland 2021*” (EPA 2022a) details the range and scope of monitoring undertaken throughout Ireland.

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes as outlined within the EPA document titled ‘*Air Quality In Ireland 2021*’ (EPA 2022a). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D. In terms of air monitoring, Arklow and its surroundings are categorised as Zone D.

In 2020 the EPA reported (EPA, 2021) that Ireland was compliant with EU legal air quality limits at all locations, however this was largely due to the reduction in traffic due to Covid-19 restrictions. The EPA *Air Quality in Ireland 2020* report details the effect that the Covid-19 restrictions had on air monitoring stations, which included reductions of up to 50% at some monitoring stations which have traffic as a dominant source. The report also notes that CSO figures show that while traffic volumes are still slightly below 2019 levels, they have significantly increased since 2020 levels. 2020 concentrations are therefore predicted to be an exceptional year and not consistent with long-term trends. For this reason, data from 2020 has been included for representative purposes only and has not been used to determine baseline levels of pollutants in the vicinity of the Proposed Development.

NO₂

NO₂ monitoring was carried out at two rural Zone D locations in recent years, Emo and Kilkitt and in the urban area of Castlebar (EPA, 2022a). The NO₂ annual average over the five year period, 2017 – 2021, ranged from 2 – 5 µg/m³ for the rural sites; with the results for Castlebar ranging from 6 – 8 µg/m³ (see Table 8.4). Therefore, long-term average concentrations measured at all locations were significantly lower than the annual average limit value of 40 µg/m³. In addition, the hourly results measured as a 99.8th percentile (i.e. it cannot be exceeded more than 18 times per year) was in compliance with the limit value of 200 µg/m³ at all sites. Based on the above information, an estimate of the current background NO₂ concentration of 8 µg/m³ has been used in the assessment.

Table 8.4 Trends In Zone D Air Quality - Nitrogen Dioxide (µg/m³)

Station	Averaging Period ^{Notes 1, 2}	Year				
		2017	2018	2019	2020	2021
Castlebar	Annual Mean NO ₂ (µg/m ³)	7	8	8	6	6
	99.8 th %ile 1-hr NO ₂ (µg/m ³)	60	60	59	Note 2	Note 2
Kilkitt	Annual Mean NO ₂ (µg/m ³)	2	3	5	2	2
	99.8 th %ile 1-hr NO ₂ (µg/m ³)	17	22	42	Note 2	Note 2
Emo	Annual Mean NO ₂ (µg/m ³)	3	3	4	4	4
	99.8 th %ile 1-hr NO ₂ (µg/m ³)	28	42	28	Note 2	Note 2

Note 1: Data for 2020 shown for representative purposes only, not used in determining background concentrations

Note 2: Hourly data for 2020 and 2021 not available from EPA

PM₁₀

Long-term PM₁₀ monitoring was carried out at the urban Zone D locations of Castlebar and Claremorris over the period 2017 – 2021. The average annual mean concentrations measured at the two sites was 10 µg/m³ in 2021 (Table 8.5). PM₁₀ measurements carried out at the rural Zone D location in Kilkitt in 2021 gave an average level of 8 µg/m³ (EPA, 2022a). Over the period 2017 – 2021 annual mean concentrations ranged from 7 – 16 µg/m³ for the Zone D locations. The 90.4th percentile of 24-hour results was also below the limit value of 50 µg/m³ at all locations. Based on the above information a conservative background concentration of 12 µg/m³ has been used in this assessment.

Table 8.5 Trends in Zone D Air Quality – PM_{10} ($\mu\text{g}/\text{m}^3$)

Station	Averaging Period	Year				
		2017	2018	2019	2020	2021
Castlebar	Annual Mean PM_{10} ($\mu\text{g}/\text{m}^3$)	11	11	16	14	10
	90 th %ile 24-hr PM_{10} ($\mu\text{g}/\text{m}^3$)	19	20	24	Note 2	Note 2
Killkitt	Annual Mean PM_{10} ($\mu\text{g}/\text{m}^3$)	8	9	7	8	8
	90 th %ile 24-hr PM_{10} ($\mu\text{g}/\text{m}^3$)	14	15	13	Note 2	Note 2
Claremorris	Annual Mean PM_{10} ($\mu\text{g}/\text{m}^3$)	11	12	11	10	10
	90 th %ile 24-hr PM_{10} ($\mu\text{g}/\text{m}^3$)	17	20	20	Note 2	Note 2

Note 1: Data for 2020 shown for representative purposes only, not used in determining background concentrations

Note 2: Hourly data for 2020 and 2021 not available from EPA

$PM_{2.5}$

The results of $PM_{2.5}$ monitoring at the Zone D location of Claremorris over the period 2017 – 2021 (EPA, 2022a) indicated an average $PM_{2.5}/PM_{10}$ ratio ranging from 0.4 – 0.8. Based on this information, a conservative ratio of 0.85 was used to generate a background $PM_{2.5}$ concentration of $9.6 \mu\text{g}/\text{m}^3$.

Based on the above information the air quality in Zone D locations, such as the Arklow area are generally good, with concentrations of the key pollutants generally well below the relevant limit values. However, the EPA have indicated that road transport emissions are contributing to increased levels of NO_2 with the potential for breaches in the annual NO_2 limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM_{10} and $PM_{2.5}$). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2022a).

8.3.3 Sensitivity of the Receiving Environment

In line with the UK Institute of Air Quality Management (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2014) prior to assessing the impact of dust from a Proposed Development the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time.

In terms of receptor sensitivity to dust soiling, there are 8 no. high sensitivity residential properties within 20m of the grid route connection (see Figure 8.2). Therefore, the overall sensitivity of the area to dust soiling impacts is considered medium based on the IAQM criteria outlined in Table 8.6.

Table 8.6 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM₁₀ concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM₁₀ concentration in the vicinity of the Proposed Development is 12 µg/m³ and are 8 no. residential properties within 20 m of the Proposed Development boundary (see Figure 8.2). Based on the IAQM criteria outlined in Table 8.7, the worst-case sensitivity of the area to human health is considered low.

Table 8.7 Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number Of Receptors	Distance from source (m)				
			<20	<50	<100	<200	<350
High	< 24 µg/m ³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	< 24 µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	< 24 µg/m ³	>1	Low	Low	Low	Low	Low

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to dust-related ecological impacts. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability of the plant as well as other effects. The guidance states that dust impacts to vegetation can occur up to 50 m from the site and 50 m from site access roads, up to 500m for the site entrance. There are no designated ecological sites within 50 m of the Proposed Development and therefore there is no potential for impacts to sensitive ecology from dust emissions and this assessment has been scoped out.

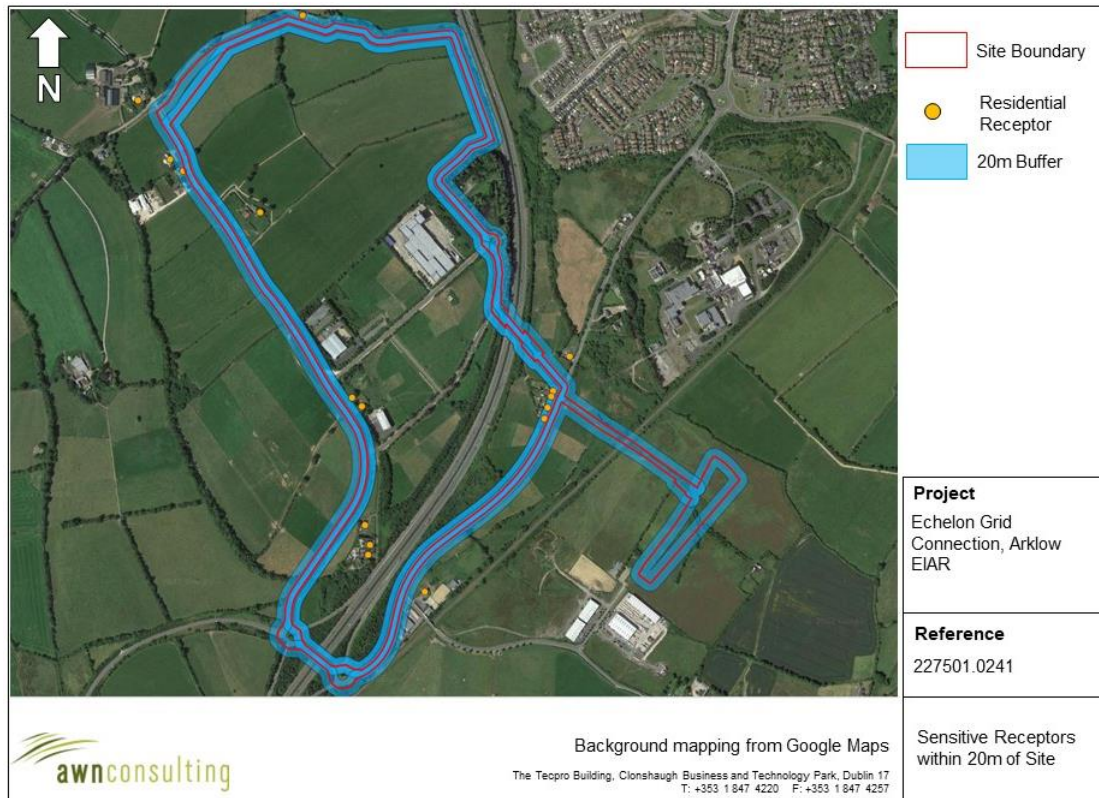


Figure 8.2 Sensitive Receptors within 20m of Site Boundary

8.3.4 Climate Baseline

Anthropogenic emissions of greenhouse gases (GHGs) in Ireland included in the European Union's Effort Sharing Regulation (ESR) (EU 2018/842) are outlined in the most recent review by the EPA which details provisional emissions up to 2021 (EPA, 2022b). The greenhouse gas emission inventory for 2021 is the first of ten years over which compliance with targets set in the ESR will be assessed. This Regulation sets 2030 targets for emissions outside of the Emissions Trading Scheme (known as ESR emissions) and annual binding national limits for the period 2021-2030. Ireland's target is to reduce ESR emissions by 30% by 2030 compared with 2005 levels, with a number of flexibilities available to assist in achieving this. Ireland's ESR emissions annual limit for 2021 is 43.48 Mt CO₂eq¹. Ireland's provisional 2021 GHG ESR emissions are 46.19 Mt CO₂eq, this is 2.71 Mt CO₂eq more than the annual limit for 2021 (EPA, 2022b). Agriculture continues to be the largest contributor to overall emissions at 37.5% of the total. Transport, energy industries and the residential sector are the next largest contributors, at 17.7%, 16.7% and 11.4%, respectively. GHG emissions for 2021 are estimated to be 4.7% higher than emissions in 2020, this is due to a gradual lifting of covid restrictions and an increase in the use of coal and less renewables within electricity generation. Ireland's GHG emissions have increased by 11.4% from 1990 – 2021.

Provisional National total emissions (including Land Use, Land-use Change and Forestry (LULUCF)) for 2021 are 69.29 Mt CO₂eq, these have used 23.5% of the 295 Mt CO₂eq Carbon Budget for the five-year period 2021-2025. This leaves 76.5% of the budget available for the succeeding four years, requiring an 8.4% average annual emissions reduction from 2022-2025 to stay within budget.

¹ Mt CO₂eq – million tonnes carbon dioxide equivalent

The EPA 2022 GHG Emissions Projections Report for 2021 – 2040 (EPA, 2022c) provides an assessment of Ireland’s total projected greenhouse gas (GHG) emissions from 2021 to 2040, using the latest Inventory data for 2020 and provides an assessment of Ireland’s progress towards achieving its National ambitions under the Climate Action and Low Carbon Development (Amendment) Act 2021 (Government of Ireland, 2021) and EU emission reduction targets for 2030 as set out under the EU Effort Sharing Regulation (ESR) 2018/842. Two scenarios are assessed – a “*With Existing Measures*” (WEM) scenario, which is a projection of future emissions based on the measures currently implemented and actions committed to by Government, and a “*With Additional Measures*” (WAM) scenario, which is the projection of future emissions based on the measures outlined in the latest Government plans at the time Projections are compiled. This includes all policies and measures included in the WEM scenario, plus those included in government plans but not yet implemented.

The EPA report states under the “*With Existing Measures*” scenario, the projections indicate that Ireland will cumulatively exceed its ESR emissions allocation by 52.3 Mt CO₂eq over the 2021-2030 period even with full use of the flexibilities available. Under the “*With Additional Measures scenario*”, the projections indicate that Ireland can achieve compliance under the ESR over the 2021-2030 period using both flexibilities but only with full implementation of the 2021 Climate Action Plan. Both projected scenarios indicate that implementation of all climate plans and policies, plus further new measures, are needed for Ireland to meet the 51 per cent emissions reduction target and put the country on track for climate neutrality by 2050 (EPA, 2022c).

8.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The Proposed Development is located in the townlands of Kish, Bogland, Ballynattin, and Ballintombay, to the south of Arklow, County Wicklow. The site area consists of three main areas: 110 kV Substation Site, Circuit Route A, Circuit Route B. The Proposed Development is described in detail in Chapter 2 (Description of the Proposed Development). The details of the construction and operation of the development in terms of Air Quality and Climate are detailed in the subsections below.

8.4.1 Construction Phase

The key civil engineering works that will have a potential impact on air quality and climate during construction are summarised below:

- (i) During construction, an amount of soil will be generated as part of the site preparation works and during excavation for building foundations and for the installation of ducting for the cable installations.
- (ii) Infilling and landscaping will be undertaken.
- (iii) Temporary storage of construction materials.
- (iv) Construction traffic accessing the site will emit air pollutants and greenhouse gases during transport.

As outlined in Section 9.6, a dust minimisation plan will be formulated for the construction phase of the Proposed Development to ensure no dust nuisance occurs at nearby sensitive receptors.

8.4.2 Operational Phase

During the operational phase, traffic accessing the site for maintenance purposes has the potential to impact on air quality and climate. However, this traffic will not be of the magnitude to cause a significant impact.

8.5 POTENTIAL IMPACTS FO THE PROPOSED DEVELOPMENT

8.5.1 Construction Phase

8.5.1.1 Air Quality

The greatest potential impact on air quality during the construction phase of the Proposed Development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 350 m of a construction site, the majority of the deposition occurs within the first 50 m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction. A review of Dublin Airport meteorological data (see Section 8.3.1) indicates that the prevailing wind direction is westerly to south-westerly and wind speeds are generally moderate in nature. In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30 year average data for Dublin Airport indicates that on average 191 days per year have rainfall over 0.2 mm (Met Eireann, 2022) and therefore it can be determined that over 50% of the time dust generation will be reduced.

In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see Section 8.3.3). As per Section 8.2.2.1 the major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (movement of heavy vehicles).

Demolition

There are no demolition activities associated with the Proposed Development. Therefore, there is no demolition impact predicted as a result of the works.

Earthworks

Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

Large: Total site area > 10,000 m², potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds > 8 m in height, total material moved >100,000 tonnes;

Medium: Total site area 2,500 m² – 10,000 m², moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8 m in height, total material moved 20,000 – 100,000 tonnes;

Small: Total site area < 2,500 m², soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4 m in height, total material moved < 20,000 tonnes, earthworks during wetter months.

The dust emission magnitude for the proposed earthwork activities can be classified as medium as the total material moved (both excavations and infilling works) will be between 20,000 – 100,000 tonnes. However, stockpiles will be restricted to less than 2 m in height. In addition, due to the linear nature of the grid connection, not all receptors will be impacted at any one time.

The sensitivity of the area, as determined in Section 8.3.3, is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. As outlined in Table 8.8, this results in an overall medium risk of dust soiling impacts and a low risk of dust related human health impacts as a result of the proposed earthworks activities.

Table 8.8 Risk of Dust Impacts – Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

Large: Total building volume > 100,000 m³, on-site concrete batching, sandblasting;

Medium: Total building volume 25,000 m³ – 100,000 m³, potentially dusty construction material (e.g. concrete), on-site concrete batching;

Small: Total building volume < 25,000 m³, construction material with low potential for dust release (e.g. metal cladding or timber).

The dust emission magnitude for the proposed construction activities can be classified as small as a worst-case as the total building volume will be less than 25,000 m³. As outlined in Table 8.9, this results in an overall low risk of dust soiling impacts and a negligible risk of human health impacts as a result of the proposed construction activities.

Table 8.9 Risk of Dust Impacts – Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Trackout

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

Large: > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m;

Medium: 10 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100 m;

Small: < 10 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

The dust emission magnitude for the proposed trackout can be classified as small, as at worst-case peak periods there will be at most 10 outward HGV movements per day.

As outlined in Table 8.10, this results in an overall low risk of dust soiling impacts and a negligible risk of human health impacts as a result of the proposed trackout activities.

Table 8.10 Risk of Dust Impacts – Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Summary of Dust Emission Risk

The risk of dust impacts as a result of the Proposed Development are summarised in Table 8.11 for each activity. The magnitude of risk determined is used to prescribe the level of site specific mitigation required for each activity in order to prevent significant impacts occurring.

There is at most a medium risk of dust soiling impacts and a low risk of human health impacts associated with the proposed works. Best practice dust mitigation measures will be implemented to ensure there are no significant impacts at nearby sensitive receptors. In addition, due to the linear nature of the grid connection, not all receptors will be impacted at any one time. It is proposed to install approximately 100m of trench at any time thereby reducing the potential dust emission magnitude from excavation and infilling activities. In the absence of mitigation, dust impacts are predicted to be short-term, negative and slight.

Table 8.11 Summary of Dust Impact Risk used to Define Site-Specific Mitigation

Potential Impact	Dust Emission Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Emission Magnitude	-	Medium	Small	Small
Dust Soiling Risk	-	Medium Risk	Low Risk	Low Risk
Human Health Risk	-	Low Risk	Negligible Risk	Negligible Risk

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase. Particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the Proposed Development satisfy the DMRB assessment criteria in Section 8.2.2.1. It can therefore be determined that the construction stage traffic will have an imperceptible, direct, neutral and short-term impact on air quality.

8.5.1.2 Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO₂ and N₂O emissions. The Institute of Air Quality Management document *Guidance on the Assessment of Dust from Demolition and Construction* (IAQM, 2014) states that site traffic and plant is unlikely to make a significant impact on climate. As per Section 8.3.4, Ireland had total GHG emissions of 46.19 Mt CO₂eq in 2021, emissions from the construction phase of the Proposed Development will be a small

fraction of this. Therefore, the potential impact on climate is considered to be imperceptible, direct, neutral and short-term.

8.5.2 Operational Phase

8.5.2.1 Air Quality & Climate

During operation, the cables will be buried underground and therefore there will be no emissions to atmosphere. There is the potential for maintenance vehicles accessing the substation site to result in emissions of NO₂, PM₁₀/PM_{2.5} and CO₂. However, due to the infrequent nature of maintenance activities and the low number of vehicles involved emissions are not predicted to be significant. A detailed air quality and climate assessment was scoped out for the operational stage of the development as per the UK DMRB screening criteria. Operational stage impacts to air quality and climate are predicted to be imperceptible, direct, neutral and long-term.

8.6 REMEDIAL AND MITIGATION MEASURES

8.6.1 Construction Phase

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the following management plan has been formulated by drawing on best practice guidance from Ireland, the UK and the USA based on the following publications:

- 'Guidance on the Assessment of Dust from Demolition and Construction' (IAQM, 2014);
- 'Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings' (The Scottish Office, 1996);
- 'Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance' (UK Office of Deputy Prime Minister, 2002);
- 'Controlling Particles, Vapours & Noise Pollution From Construction Sites' (BRE, 2003);
- 'Fugitive Dust Technical Information Document for the Best Available Control Measures' and the USA (USEPA, 1997); and
- 'Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition' (periodically updated) (USEPA, 1986).

AWN Consulting and the project team have prepared *Outline Construction Environmental Management Plan (CEMP)* (2022) that is included with the application documentation. The construction Contractor will provide a further detailed CEMP that will include any subsequent planning conditions relevant to the Proposed Development and set out further detail of the overarching vision of how the construction Contractor of the Proposed Development manage the Site in a safe and organised manner.

Site Management

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies.

At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 8.1 for the wind rose for Dublin Airport). As the prevailing wind is predominantly, westerly to south-westerly, locating construction compounds and storage piles downwind (to the east or northeast) of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed (UK Office of Deputy Prime Minister (2002), BRE (2003)). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials (USEPA, 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions near the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods where care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised;
- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein;
- At all times, the procedures put in place will be strictly monitored and assessed.

The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

Site Roads / Haulage Routes

Movement of construction trucks along site roads (particularly unpaved roads) can be a significant source of fugitive dust if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK Office of Deputy Prime Minister, 2002).

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved site roads;
- Access gates to the site will be located at least 10m from sensitive receptors where possible;
- Bowsers or suitable watering equipment will be available during periods of dry weather throughout the construction period. Research has found that watering can reduce dust emissions by 50% (USEPA, 1997). Watering will be conducted during sustained dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use;
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.

Land Clearing / Earth Moving

Land clearing / earth-moving works during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering will be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust;
- During periods of very high winds (gales), activities likely to generate significant dust emissions will be postponed until the gale has subsided.

Storage Piles

The location and moisture content of storage piles are important factors which determine their potential for dust emissions.

- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles will be located downwind of sensitive receptors;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust. The regular watering of stockpiles has been found to have an 80% control efficiency (UK Office of Deputy Prime Minister, 2002);
- Where feasible, hoarding will be erected around site boundaries to reduce visual impact. This will also have an added benefit of preventing larger particles from impacting on nearby sensitive receptors.

Site Traffic on Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads will be reduced to a minimum by employing the following measures:

- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- At the main site traffic exits, a wheel wash facility will be installed. All trucks leaving the site must pass through the wheel wash. In addition, public roads outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.

Summary of Dust Mitigation Measures

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed; and
- The specification of effective measures to deal with any complaints received.

8.6.2 Operational Phase

No mitigation is proposed for the operational phase of the Proposed Development as impacts to air quality or climate will be imperceptible.

8.7 RESIDUAL EFFECTS OF THE PROPOSED DEVELOPMENT

8.7.1 Construction Phase

8.7.1.1 Air Quality

When the dust mitigation measures detailed in the mitigation section of this report (Section 8.6) are implemented, the residual effect of fugitive emissions of dust and particulate matter from the site will be **short term, direct, negative** and **imperceptible** in nature, posing no nuisance at nearby receptors.

8.7.1.2 Climate

Based on the scale and temporary nature of the construction works and the intermittent use of equipment, the residual effect on climate change and transboundary pollution from the Proposed Development is deemed to be **short term, neutral** and **imperceptible** in relation to Ireland's obligations under the EU 2030 target.

8.7.1.3 Human Health

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

8.7.2 Operational Phase

8.7.2.1 Air Quality & Climate

The residual effect of the operational phase impacts associated with the Proposed Development are predicted to be **neutral, long-term** and **imperceptible** as the cables

will be buried underground once constructed and there will be minimal emissions associated with maintenance vehicles accessing the substation site.

8.8 MONITORING

8.8.1 Construction Phase

Monitoring is not proposed for the construction phase of the Proposed Development as impacts are predicted to be imperceptible. Once the dust mitigation measures outlined in the mitigation section are implemented construction dust emissions will be imperceptible.

8.8.2 Operational Phase

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

8.9 CUMULATIVE IMPACTS OF THE DEVELOPMENT

The potential for cumulative impact (as far as practically possible) of the Proposed Development with any/all relevant planned, existing or permitted developments as set out in Chapter 2, Section 2.8 and 2.9 of the EIA, unless otherwise stated. The likelihood of cumulative effects is discussed in Sections 8.9.1 and 8.9.2 below for construction and operational phases.

8.9.1 Construction Phase

According to the IAQM guidance (2014), there is the potential for cumulative dust impacts to any nearby sensitive receptors should the construction phase of the Proposed Development coincide with the construction phase of other permitted developments within 350m of the site. A review of the planned and permitted projects within the vicinity of the site as set out in Chapter 2, Section 2.8 and 2.9 of the EIA has identified the only simultaneous construction projects capable of combining with the Proposed Development is the Permitted ICT Facility (WCC Reg. Ref. 20/1088). Additionally, there is the potential for the Proposed Development to combine with the construction phase of the Biofuel Facility proposed under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

The permitted ICT Facility (WCC Reg. Ref. 20/1088) is subject to the Environmental Impact Assessment Report and planning conditions which include appropriate mitigation measures to minimise environmental impacts. Furthermore, Condition 8 of WCC Reg. Ref. 20/1088 requires the works contractor to provide a detailed Construction Environmental Management Plan (CEMP) for the Permitted ICT Facility. The CEMP for the Permitted ICT Facility will ensure that this project will be managed in a safe and organised manner by the Contractor.

There is a medium risk of dust soiling impacts and a low risk of human health impacts associated with the Proposed Development. The dust mitigation measures outlined in Section 8.6 of Chapter 8 will be applied during the construction phase which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the Proposed Development and the permitted ICT facility development are deemed short-term, direct, negative and imperceptible.

The proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181 is similarly; subject to an Environmental Impact Assessment Report which includes appropriate mitigation measures to minimise environmental impacts. The proposed Biofuel Facility application included an outline Construction Management Plan (CMP). The CMP for the proposed Biofuel Facility will ensure that this project will be managed in a safe and organised manner by the Contractor.

With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the Proposed Development and the permitted Biofuel Facility are deemed short-term, direct, negative and imperceptible.

Due to the relatively small scale of the Proposed Development and the short-term construction stage significant cumulative impacts to climate are not predicted.

8.9.2 Operational Phase

Operational phase direct impacts on air quality associated with the Proposed Development are predicted to be imperceptible. As there are no emissions to atmosphere associated with the cables once constructed as they will be buried underground there are no potential impacts associated with this aspect of the development. Cumulative traffic emissions associated with site maintenance vehicles and vehicles on the local road network have the potential to impact air quality. However, as the number of vehicles required for maintenance activities is low and infrequent in nature cumulative impacts are considered imperceptible and long-term.

In relation to climate, there will be no direct operational CO₂ emissions associated with the Proposed Development. The Proposed Development will facilitate the development of the permitted ICT facility (WCC Reg. Ref. 20/1088). The indirect CO₂ emissions associated with the electricity to operate the ICT facility development were determined within the EIAR for the development (detailed below) and were found to be insignificant in relation to climate.

*The indirect CO₂ emissions from electricity to operate the proposed data centre will not be significant in relation to Ireland's national annual CO₂ emissions. A Report titled 'Energy In Ireland (2019 Report)' published by the Sustainable Energy Authority of Ireland (SEAI) states the average CO₂ emission factor for electricity generated in Ireland was 375 gCO₂/kWh in 2018. This average CO₂ emission factor is based on the national power generating portfolio. On the basis that the Proposed Development will consume 110MW of power, this equates to 964 GWh annually based on the assumption of the national fuel mix. This translates to approximately 361,350 tonnes of CO₂eq per year. This will have an **indirect, long-term, negative and slight** impact on climate.*

As the permitted ICT facility (WCC Reg. Ref. 20/1088) is over 20 MW, a greenhouse gas emission permit will be required for the facility which will be regulated under the EU-wide Emission Trading Scheme (ETS). Electricity providers form part of the ETS and thus greenhouse gas emissions from these electricity generators are not included when determining compliance with the targeted 30% reduction in the non-ETS sector i.e. electricity associated greenhouse gas emissions will not count towards the Effort Sharing Decision target. Thus, any necessary increase in electricity generation due to data storage facility demand will have no impact on Ireland's obligation to meet the EU Effort Sharing Decision. On an EU-wide basis, where the ETS market in 2019 was approximately 1,390 million tonnes CO₂eq, the impact of the emissions associated with the data storage facility will be less than 0.03% of the total EU-wide ETS market which is imperceptible. Thus, the indirect emissions associated with the operation of the

Proposed Development are **indirect, long-term, negative** and **slight** with regards to GHG emissions.

Overall, the impact to air quality and climate as a result of the proposed cumulative development will be negative, direct and long-term ranging from imperceptible to slight.

8.10 REFERENCES

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Transport Infrastructure Ireland (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes

UK Highways Agency (2019a) UK Design Manual for Roads and Bridges (DMRB), Volume 11, Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 LA 105 Air quality

UK Highways Agency (2019b) UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate

UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance

USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures

World Health Organisation (2006) Air Quality Guidelines - Global Update 2005 (and previous Air Quality Guideline Reports 1999 & 2000)

9.0 NOISE AND VIBRATION

9.1 INTRODUCTION

This document prepared by AWN Consulting Ltd (AWN) to assess the likely significant noise and vibration impacts of the proposed development in the context of current relevant standards and guidance.

This chapter includes a description of the receiving ambient noise climate in the vicinity of the subject site and an assessment of the potential noise and vibration impact associated with the proposed development, during both the short-term construction phase and the long-term operational phase, on its surrounding environment. The assessment of direct, indirect and cumulative noise and vibration impacts on the surrounding environment have been considered as part of the assessment.

Mitigation measures are included, where relevant, to ensure the proposed development is constructed and operated in an environmentally sustainable manner in order to ensure minimal impact on the receiving environment.

9.2 METHODOLOGY

9.2.1 Proposed Approach

The following methodology has been adopted for this assessment:

- review appropriate guidance and planning conditions applicable to the associated site, etc. in order to identify appropriate noise criteria for the site operations;
- review noise monitoring at a number of locations (e.g. in the vicinity of nearest sensitive properties/boundaries) to identify existing levels of noise in the vicinity of the development;
- calculate indicative construction noise levels associated with the key construction activities to consider the potential noise impact of the proposed development, and;
- comment on predicted levels against the appropriate criteria and existing noise levels and outline required mitigation measures (if any).

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

9.2.2 Fundamentals of Acoustics

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

A sound wave travelling through the air is a regular disturbance of the atmospheric pressure. These pressure fluctuations are detected by the human ear, producing the sensation of hearing. In order to take account of the vast range of pressure levels that can be detected by the ear, it is convenient to measure sound in terms of a logarithmic

ratio of sound pressures. These values are expressed as Sound Pressure Levels (SPL) in decibels (dB).

The audible range of sounds expressed in terms of Sound Pressure Levels is 0dB (for the threshold of hearing) to 120dB (for the threshold of pain). In general, a subjective impression of doubling of loudness corresponds to a tenfold increase in sound energy which conveniently equates to a 10dB increase in SPL. It should be noted that a doubling in sound energy (such as may be caused by a doubling of traffic flows) increases the SPL by 3dB.

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

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

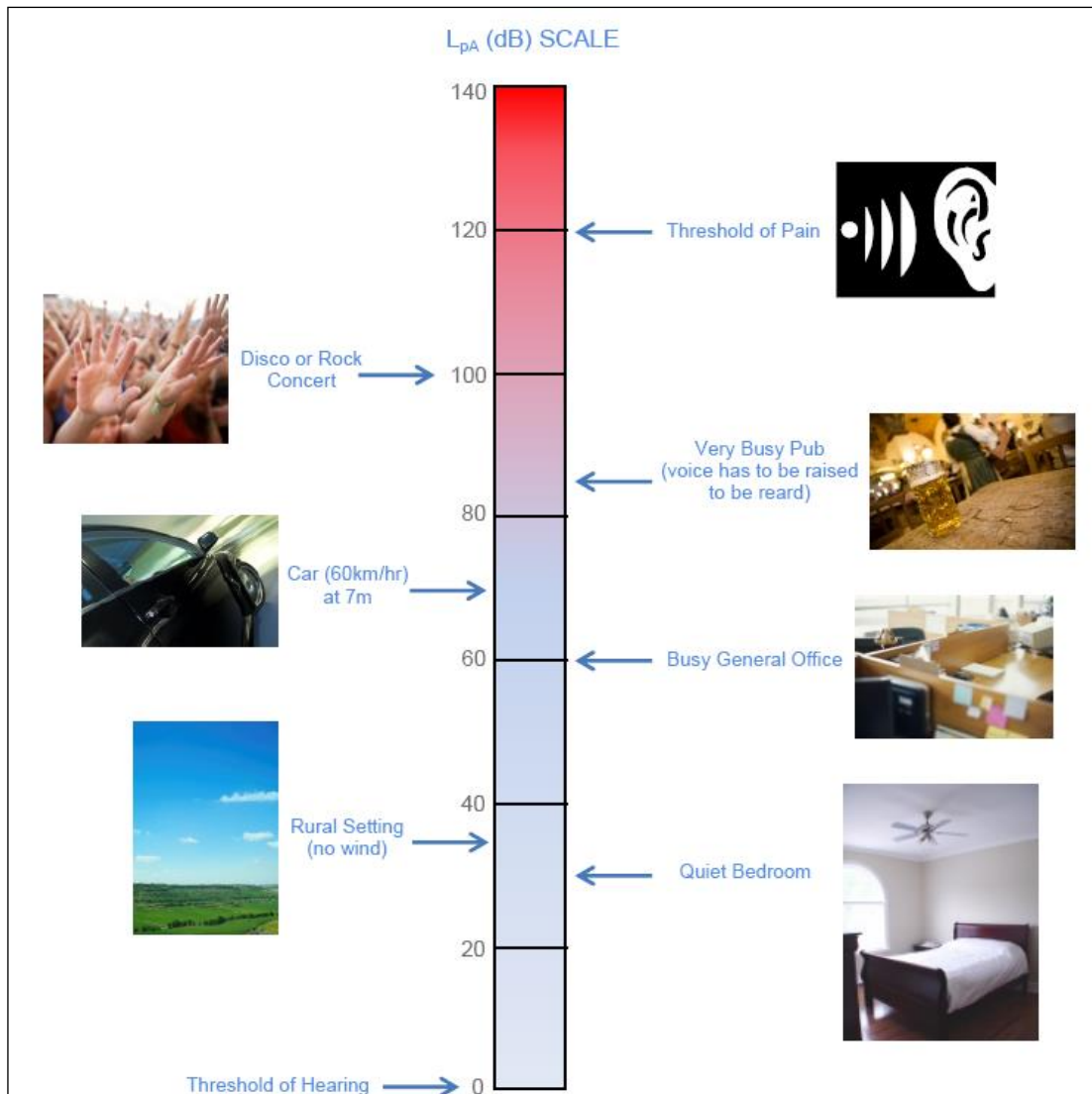


Figure 9.1 dB(A) Scale & Indicative Noise Levels – (EPA: Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4 – 2016)).

9.2.3 Forecasting Methods

Construction noise calculations have been conducted generally in accordance with BS 5228: 2009+A1:2014: Code of practice for noise control on construction and open sites - Noise.

Changes in road traffic noise on the local road network have been considered using prediction guidance contained within Calculation of Road Traffic Noise (CRTN) issued by the UK's Department of Transport in 1988.

9.2.4 Construction Phase Guidance

9.2.4.1 Criteria for Rating Noise Impacts

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

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

The approach adopted in BS 5228 – 1 calls for the designation of a noise sensitive location into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a significant noise impact is associated with the construction activities.

BS5228 – 1 sets out guidance on permissible noise levels relative to the existing noise environment. Table 9.1 sets out the values which, when exceeded, signify a significant effect at the facades of residential receptors as recommended by BS 5228 – 1. These are construction noise levels only and not the cumulative noise level due to construction plus existing ambient noise.

Table 9.1 Example Threshold of Significant Effect at Dwellings

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

Note A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.

Note B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.

Note C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.

Note D) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

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

For the appropriate periods (i.e. daytime, evening and night-time) the ambient noise level is determined and rounded to the nearest 5dB. Baseline monitoring carried out as part of this assessment, indicate that the baseline categories summarised in Table 9.2 are appropriate in terms of the nearest noise sensitive locations being considered in this instance.

Table 9.2 Rounded Baseline Noise Levels and Associated Categories

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

If the construction noise level exceeds the appropriate category value, then a potential significant effect is deemed to occur.

The assessment process outlined above determines if a potential significant construction noise impact is likely. Notwithstanding the outcome of this assessment, the overall acceptable levels of construction noise are set out in the Transport Infrastructure Ireland (TII) publication *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*¹, which should not be exceeded at noise sensitive locations during the construction phase of the development. Table 9.3 sets out these levels.

Table 9.3 *Maximum Permissible Noise Levels at the Facade of Dwellings during Construction*

Days and Times	Noise Levels (dB re. 2×10^{-5} Pa)	
	$L_{Aeq}(1hr)$	L_{Amax}
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60*	65*
Saturdays 08:00 to 16:30hrs	65	75
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

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

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

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

70 dB $L_{Aeq,1hr}$ at residential noise sensitive locations

75 dB $L_{Aeq,1hr}$ at commercial properties

9.2.4.2 Criteria for Rating Vibration Impacts

There are two aspects to the issue of vibration that are addressed in the standards and guidelines: the risk of cosmetic or structural damage to buildings; and human perception of vibration. In the case of this development, vibration levels used for the purposes of evaluating building protection and human comfort are expressed in terms of Peak Particle Velocity (PPV) in mm/s.

There is no published statutory Irish guidance relating to the maximum permissible vibration level. The following standards are the most widely accepted in this context and are referenced here in relation to cosmetic or structural damage to buildings:

- British Standard BS 5228-2 (BSI 2014b); and
- British Standard BS 7385-2 (BSI 1993)

BS 5228-2 and BS 7385-2 define the following thresholds for cosmetic damage to residential or light commercial buildings: PPV should be below 15 mm/s at 4 Hz to avoid cosmetic damage. This increases to 20 mm/s at 15 Hz and to 50 mm/s at 40 Hz

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

and above. At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded. This is summarised in Table 9.4 below.

Table 9.4 Transient vibration guide values for cosmetic damage

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Unreinforced or light framed structures. Residential or light commercial buildings.	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Note 1: Values referred to are at the base of the building.

Note 2: At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

Furthermore, BS 5228-2 and BS 7385-2 state that minor structural damage can occur at vibration magnitudes greater than twice those in Table 9.4 and major structural damage can occur at vibration magnitudes greater than four times those in Table 9.4.

BS 5228-2 also provides guidance relating to the human response to vibration. Guidance is again provided in terms of PPV in mm/s since this parameter is routinely measured when monitoring the structural effects of vibration. The potential human response at different vibration levels, as set out in BS 5228-2, is summarised in Table 9.5.

Table 9.5 Guidance on human response to vibration levels

Vibration level ^{Note A) B) C)} (mm/s)	Effect
0.14	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3	Vibration might be just perceptible in residential environments.
1.0	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

A) The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.

B) A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.

C) Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472-1 or -2, and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.

9.2.4.3 Criteria for Rating Construction Phase Traffic

Vehicular movement to and from the construction site for the proposed development will make use of the existing road network. In order to assess the potential impact of additional traffic on the human perception of noise, the following two guidelines are referenced DMRB Noise and Vibration (UKHA 2020) and the EPA Guidelines (EPA, 2022). For construction traffic, due to the short-term period over which this impact

occurs, the magnitude of impacts is assessed against the 'short term' period in accordance with the DMRB Noise and Vibration (UKHA 2020) document.

Table 9.6 sets out the classification of changes in noise level to impact on human perception based on the guidance contained in these documents.

Table 9.6 Classification of magnitude of traffic noise changes in the short-term

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Short-term)	EPA Significance of Effect
Less than 1 dB	Inaudible	Negligible	Imperceptible
1 – 2.9	Barely Perceptible	Minor	Not Significant
3 – 4.9	Perceptible	Moderate	Slight, Moderate
≥ 5	Up to a doubling of loudness	Major	Significant

9.2.5 Operational Phase Noise Guidance

As the proposed 110kV lines will be located underground for the majority of the length of the cable route, there is no operational noise impact associated with this aspect of the proposed development. Similarly, there is no noise generation associated with the proposed masts. In relation to the proposed substation, and to form a context for the cumulative assessment of the proposed development together with the adjacent permitted development, Wicklow County Council Ref. 20/1088, (hereafter referred to as the Permitted ICT Facility), appropriate noise guidance is discussed here:

9.2.5.1 BS 4142:2014+A1:2019

BS 4142:2014+A1:2019: *Methods for rating and assessing industrial and commercial sound is the industry standard method for analysing building services plant sound emissions to residential receptors.* BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident. It should also be noted that the Environmental Protection Agency (EPA) document Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4 - 2016) indicates that this assessment methodology should be used in the assessment of complaints associated with a site's operations.

For an appropriate BS 4142 assessment it is necessary to compare the measured external background sound level (i.e. the $L_{A90,T}$ level measured in the absence of plant items) to the rating level ($L_{Ar,T}$) of the various plant items, when operational. Where sound emissions are found to be tonal, impulsive, intermittent or to have other sound characteristics that are readily distinctive against the residual acoustic environment, BS 4142 advises that penalties be applied to the specific level to arrive at the rating level.

The subjective method for applying a penalty for tonal sound characteristics outlined in BS 4142 recommends the application of a 2dB penalty for a tone which is just perceptible at the receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible. In relation to intermittency, BS 4142 recommends that If the intermittency is readily distinctive against the residual acoustic environment, a penalty

of 3 dB can be applied. The following definitions as discussed in BS 4142 as summarised below:

“ambient sound level, $L_{Aeq,T}$ ”	equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at any given time, usually from many sources near and far, at the assessment location over a given time interval, T.
“residual sound level, $L_{Aeq,T}$ ”	equivalent continuous A-weighted sound pressure level of the residual sound (i.e. ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound) at the assessment location over a given time interval, T.
“specific sound level, $L_{Aeq,T}$ ”	equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r .
“rating level, $L_{Ar,T}$ ”	specific sound level plus any adjustment for the characteristic features of the sound.
“background sound level, $L_{A90,T}$ ”	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.

In order to establish an initial estimate of impact, BS 4142 states the following:

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level from the rating level, and consider the following.

- a. *Typically, the greater this difference, the greater the magnitude of the impact.*
- b. *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- c. *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
- d. *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

The assessment methodology described above (i.e. comparison of rated sound level to background sound level) is quoted in BS 4142 as representing a methodology to 'obtain an initial estimate' of impact. It is important to note that BS 4142 also comments that 'Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration'. BS 4142 provides a list of potential pertinent factors that can influence the 'initial estimate'. The noise assessment conducted in the following sections has been carried out with consideration of the guidance contained in BS 4142 as summarised above.

9.2.5.2 Assessment of Significance

The 'Guidelines for Environmental Noise Impact Assessment' produced by the Institute of Environmental Management and Assessment (IEMA) (2014) have been referenced in order to categorise the potential effect of changes in the ambient noise levels during the operational phases of the proposed development.

The guidelines state that for any assessment, the potential significance should be determined by the assessor, based upon the specific evidence and likely subjective response to noise. Due to varying factors which effect human response to environmental noise (prevailing environment, noise characteristics, time periods, duration and level etc.) assigning a subjective response must take account of these factors.

The scale adopted in this assessment is shown in Table 9.7 below and is based on an example scale within the IEMA guidelines. The corresponding significance of impact presented in the 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (EPA, 2022) is also presented.

Table 9.7 Noise Impact Scale – Operational Noise Sources

Noise Level Change dB(A)	Subjective Response	Long Term Impact Classification (IEMA, 2014)	Impact Guidelines on the Information to be contained in EIA Report's (EPA)
≥ 0	No change	Negligible	Imperceptible
≥ 0 and < 3	Barely perceptible		Not Significant
≥ 3 and < 5	Noticeable	Minor	Slight - Moderate
≥ 5 and < 10	Up to a doubling or halving of loudness	Moderate	Moderate - Significant
≥10	More than a doubling or halving of loudness	Major	Significant - Profound

The significance table reflects the key benchmarks that relate to human perception of sound. A change of 3dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10dB(A) change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level.

It is considered that the ratings specified in the above table provide a good indication as to the likely significance of changes on noise levels in this case and have been used to assess the impact of operational noise.

9.2.5.3 Noise Conditions for adjacent development Ref 20/1088

The adjacent site to the southeast has a grant of planning permission for Permitted ICT Facility buildings and associated services, Wicklow County Council ref 20/1088. Condition 15(a) in the grant of planning refers to the noise generated by that site, as follows:

15. (a) *the noise level arising from the operation of the proposed development shall be in accordance with the predicted noise limits for daytime, evening and night time detailed in the Environmental Impact Assessment Report and in any case shall not exceed ambient noise levels by more than 5Dba (Leq 15 min) at noise sensitive receptors.*

The noise limits within the EIAR referred to in the condition above are as follows:

- Day to Day Operation (Noise Sensitive) – **35 to 40dB** $L_{Aeq,15min}$
(Ref. BS 4142:2014+A1:2019)
Generator Testing (Daytime) (Noise Sensitive) – **55dB** $L_{Aeq,15min}$
(Ref. EPA NG4)
Day to Day Operation (Commercial) – **55dB** $L_{Aeq,15min}$
(Ref. BS 8233)
Emergency Operation (Noise Sensitive) – **55dB** $L_{Aeq,15min}$
(Ref. EPA: NG4)
Emergency Operation (Commercial) – **65dB** $L_{Aeq,15min}$

As noted in the EIAR, plant noise emissions are to be designed such that they are not tonal and do not have impulsive characteristics at the nearest noise sensitive locations.

9.2.5.4 Guidance on Operational Vibration

It should be noted that the proposed development will not give rise to any significant levels of operational vibration off site and therefore the associated impact is not significant.

9.3 RECEIVING ENVIRONMENT

In this EIAR Chapter, reference is made to the background noise survey carried out by AWN in the preparation of the EIAR for Permitted ICT Facility.

Examination of the area surrounding the Proposed Development show that there are a number of noise-sensitive locations, both private and commercial in the vicinity, as shown in Figure 9.3.

An environmental noise survey was conducted in order to quantify the existing noise environment. The survey was conducted in general accordance with ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise*. Specific details are set out below.

9.3.1 Environmental Noise Survey

Noise measurements were conducted during a 48-hour period using an unattended sound level meter set up within the site. As the proposed development in question will operate on a 24-hour basis, the potential impact during the quieter night time periods

is the critical issue. The survey was conducted from 14:30hrs on Tuesday 2 June to 11:00 hrs on Thursday 4 June 2020.

9.3.1.1 Personnel and Instrumentation

AWN Consulting installed, configured and collected the noise monitoring equipment. The noise measurements were performed using a Rion NL52 Sound Level Meter. Before and after the survey the measurement apparatus was check calibrated using a Brüel & Kjær Type 4231 Sound Level Calibrator.

9.3.1.2 Measurement Locations

Figure 9.3 details the approximate location of the measurement position identified as NML (noise monitoring location). The location was chosen to represent the quietest environment in the surroundings of the noise-sensitive locations to the north and south of the site. This location was chosen to represent the quietest noise environment at NSLs near the Permitted ICT Facility. Existing noise levels at the wider set of locations are discussed in the following sections.

Figure 9.2 Nearest noise-sensitive receptors. (Background Imagery: © Google Earth)

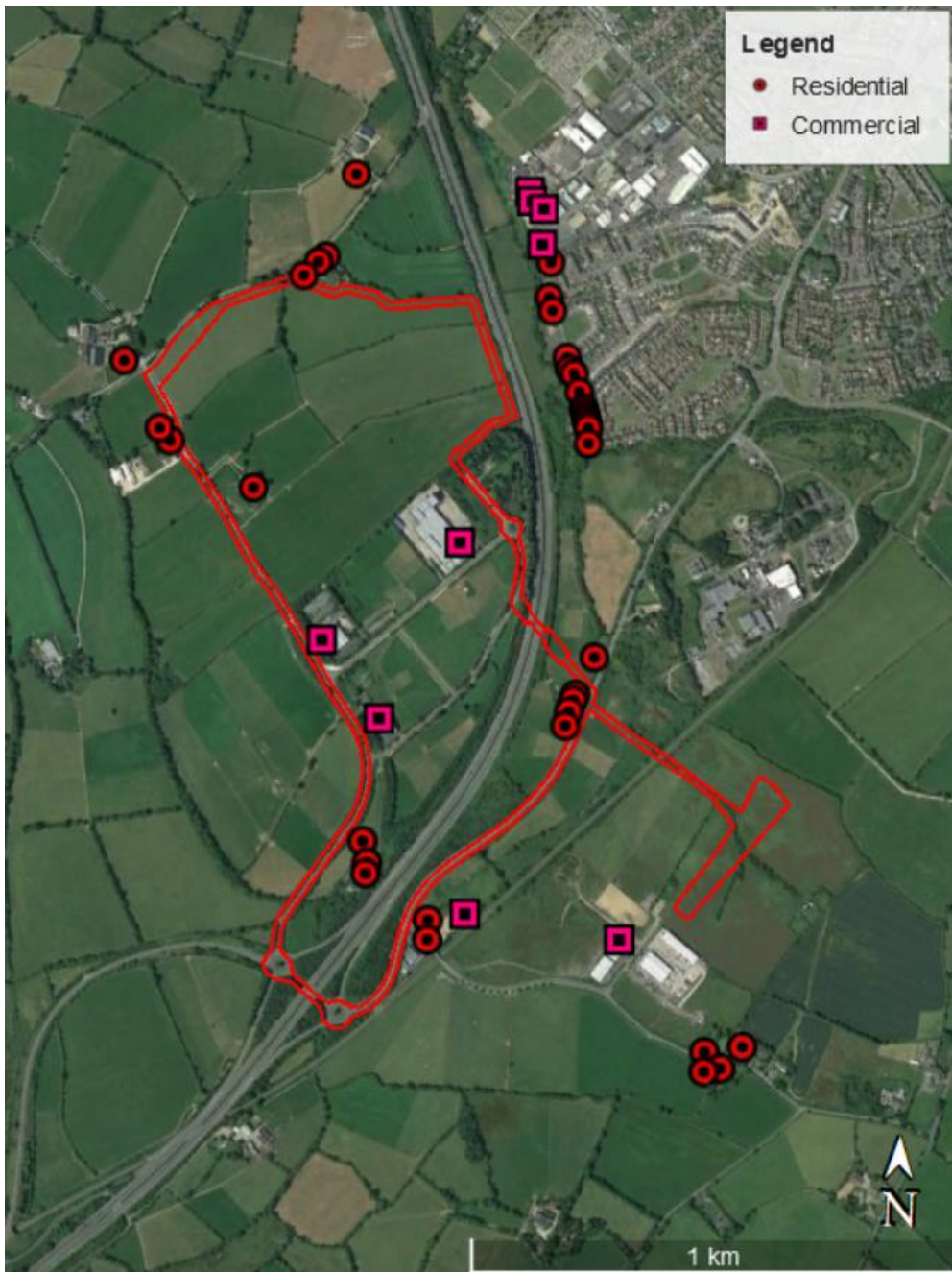


Figure 9.3 Noise Monitoring Location. (Background Imagery: © Google Earth)

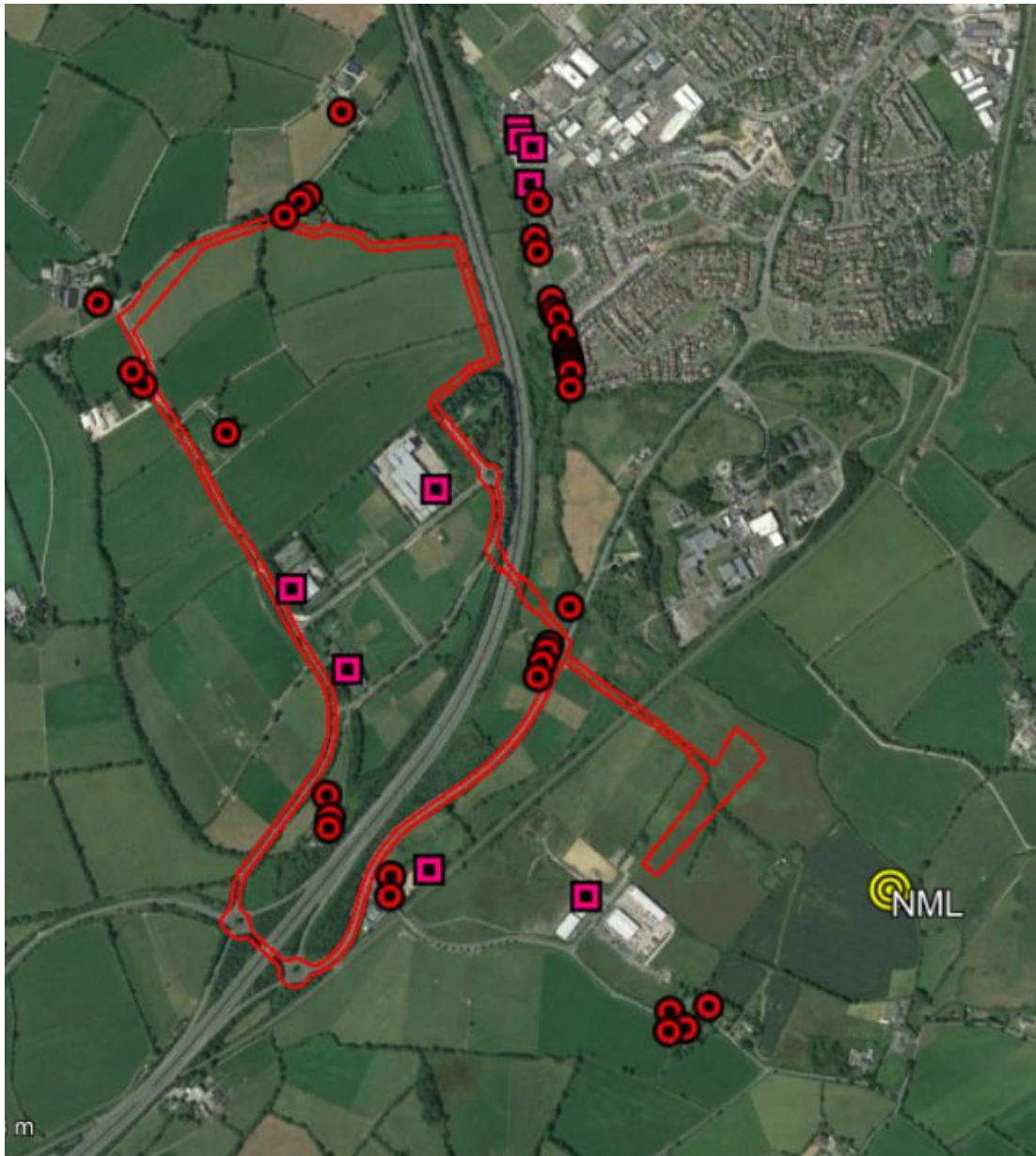


Figure 9.4 Noise Level Meter: yellow circle shows position of microphone



9.3.1.3 Methodology

Measurement equipment was configured to record noise levels over consecutive 15-minute intervals. The equipment was check-calibrated using a sound level meter calibrator at the time of installation and again at collection. Survey personnel noted the primary noise sources contributing to noise build-up during site visits.

9.3.1.4 Survey Results

The survey results summarised in Table 9.8 below. The periods are defined as follows:

- Daytime: 07:00hrs to 19:00hrs
- Evening time: 19:00hrs to 23:00hrs
- Night-time: 23:00hrs to 07:00hrs.

Table 9.8 Summary of Measured Noise Levels

Date	Period	Measured Noise Levels (dB re. 2×10^{-5} Pa)	
		L _{Aeq}	L _{A90}
Tuesday 2 June	Daytime (14h – 19 h)	40	35
	Evening	42	40
Tuesday 2 to Weds. 3 June	Night-time	41	33
Weds 3 June	Daytime	50	46
	Evening	42	38
Weds 3 to Thurs 4 June	Night-time	44	36
Thurs 4 June	Daytime (07h - 11h)	48	45

Note 1: L_{Aeq,T} parameter refers to L_{Aeq,T} over the period (logarithmic average)

Note 2: L_{A90} Average refers to the arithmetic average of L_{A90} readings

Audible noise sources during site visits were distant traffic on the M11 motorway and regional road and birdsong. Daytime noise levels were in the range 40 to 50 dB L_{Aeq,12hr}. Evening time noise levels were of the order of 42dB L_{Aeq,4hr}. Night-time background noise levels were in the range 33 to 36 dB L_{A90}.

No significant source of vibration was noted during the site visits.

9.3.2 EPA Road Noise Maps

To assist in establishing a representative baseline noise environment in the vicinity of the site, reference has been made to the Environmental Protection Agency (EPA) strategic noise mapping. The noise maps are provided for the overall day-evening-night period in terms of L_{den} and for the night-time period in terms of L_{night}. All data has been taken from the EPA Mapping website <http://gis.epa.ie>.

Figures 9.5 and 9.6 present the predicted noise levels across the development site for road traffic in terms of L_{den} and L_{night}.

Figure 9.5 *L*_{den} Road Traffic Noise Levels

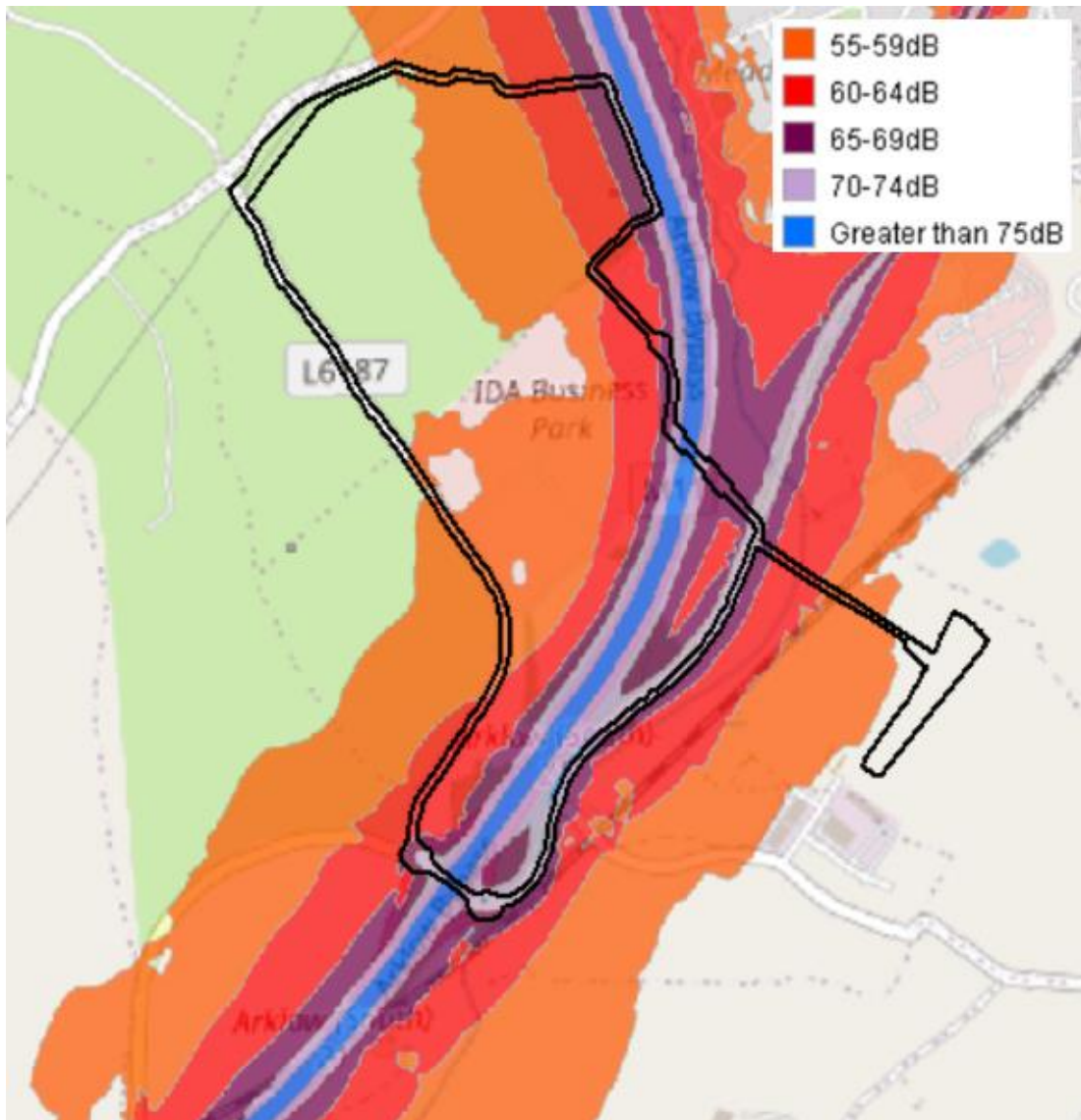
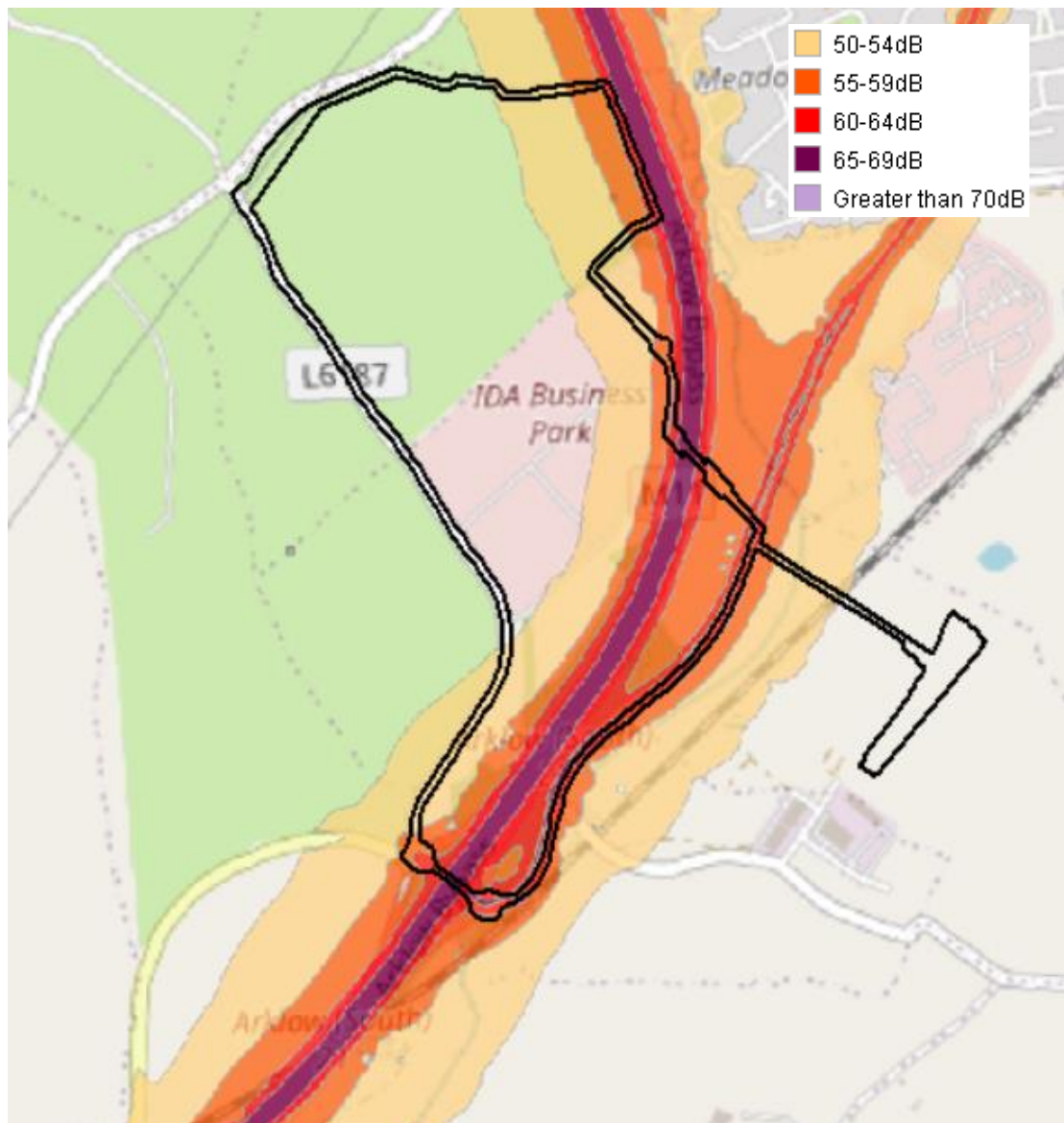


Figure 9.6 *L_{night} Road Traffic Noise Levels*



Daytime noise levels in the locations where there are residential NSLs are in the range 60 to 64 dB L_{den} at the highest, ranging to below 55 dB L_{den} at locations away from major roads. Night-time noise levels in the locations where there are residential NSLs are in the range 55 to 59 dB L_{night} at the highest, ranging to below 50 dB L_{night} at locations away from major roads.

9.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A variety of items of plant will be in use for the purposes of site preparation, construction and site works. There will be vehicular movements to and from the site that will make use of existing roads. Due to the nature of these activities, there is potential for generation of high levels of noise. The main noise-generating activities associated with the underground cable are the excavation of the trench along the route. The main noise-generating activities associated with the substation construction are the land clearance and the laying of foundations. For more information on the construction methodology, please refer to Chapter 2.

Construction activities will mostly be carried out during normal daytime working hours. Normal construction hours will be specified by planning conditions of a grant of permission for the Proposed Development, or by the local authority.

Once operational, there will be no significant off-site noise emissions from the operation of the cable installations and associated cable bays.

These issues are discussed in detailed in the following sections.

Estimates for the duration of the construction works are included in the table below. The overall start-to-finish duration is estimated to be 12 months with development aspects overlapping. Construction is anticipated to commence in Q3 2023 and be completed by Q3 2024.

No more than a 100 m section of trench will be opened at any one time. The second 100 m will only be excavated once the majority of reinstatement has been completed on the first. The excavation, installation and reinstatement process will take place at a rate of c. 100 m per day.

Table 9.9 Estimated Construction Duration

Work Package	Estimated Construction Duration
Substation and associated works	12 months
Ducting, cabling and mast works	8 months

9.5 POTENTIAL IMPACT OF THE PROPOSAL

9.5.1 Construction Phase

Construction noise predictions have been carried out using guidance set out in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise.

Construction works associated with the underground cable will be temporary in duration. It is estimated that the construction will take approximately c. 12 months, with construction elements overlapping. The excavation and reinstatement of the underground cable works will be ongoing in sections as the project proceeds.

Table 9.10 outlines the noise levels associated with typical construction noise sources assessed in this instance along with typical sound pressure levels from BS 5228 – 1: 2009+A1:2014 at various distances from these works.

Table 9.10 Indicative Noise Levels from Construction Plant at Various Distances from the cable

Item (BS 5228 Ref.)	Highest Predicted Noise Level at Stated Distance from Edge of Works (dB L _{Aeq,1hr})			
	20m	30m	50m	100m
Road breaker (hand-held pneumatic) (C5.3)	74	70	66	60
Wheeled Loader Lorry (C2.28)	68	64	60	54
Tracked Excavator (C.4.64)	67	63	59	53
Dozer (C2.13)	70	66	62	56
Dump Truck (C4.2)	70	66	62	56
Asphalt Spreader (C5.30)	67	63	59	53
Compressor (C3.19)	67	63	59	53
Vibratory Roller (C5.25)	67	63	59	53
Directional Drilling (Generator) (C2.44)	69	65	61	55
HGV Movements (10 per hour)	53	49	45	39

Note * Assumes noise control measures as outlined in Table B1 of BS 5228 – 1 (i.e. fit acoustic exhaust).

Construction works associated with cable works will be the dominant source of noise at the nearest noise sensitive locations when they occur. Other construction activity from the proposed development is at sufficient distance from a significant proportion of the proposed cable works, so that when they occur at the same time, cumulative issues will not be a material issue.

The noise levels presented in Table 9.10 are within the weekday daytime construction noise limit values shown in Table 9.3, at distances of 20m or greater from the works, with the exception of rock breaking. At distances greater than 30m from the works, the construction activities are predicted to be below the 70dB L_{Aeq,1hr} construction noise criterion adopted. A significant effect is therefore not predicted in relation to the nearest

noise sensitive locations at these distances in terms of this aspect of potential construction noise. The closest noise sensitive locations are those along the L1687 and L2190 at Ballintombay, towards the northern part of Circuit B, at some 5m distance from the line of the proposed underground line installation.

It is possible that significant construction noise occurs while the works are being carried out at short distances from noise-sensitive locations. However, as the works will proceed along the route the duration of the effect is considered brief.

In terms of noise associated with the gird connection route the associated effect is stated to be **negative, significant** and **brief**.

In relation to the noise from the substation construction, the associated effect is stated to be **negative, slight** and **temporary**:

9.5.1.1 Construction Traffic

In terms of the additional construction traffic on local roads that will be generated as a result of this development the following comment is presented. In order to increase traffic noise levels by 1 dB traffic volumes would need to increase by the order of 25% along the local road network. As outlined in the relevant sections of Chapter 12 relating to traffic, additional traffic introduced onto the local road network due to the construction phase of the Proposed Development will not result in a significant noise impact.

In terms of noise associated with these construction activities the associated effect is stated to be **neutral, imperceptible** and **temporary**:

9.5.1.2 Construction Vibration

In terms of vibration, due to the distance of activities from the site to the nearest sensitive locations and controlling vibration levels to those detailed in Table 9.4 the associated effect is stated to be **neutral, imperceptible** and **temporary**.

9.5.2 **Operational Phase**

9.5.2.1 110 kV Substation

The 110 kV Substation will be operational 24/7 and the noise impact at the nearest NSL has been assessed to identify the potential greatest impact associated with the operation of the Substation at the nearest NSL.

The following extract from the EirGrid Evidence Based Environmental Studies Study 8: Noise – Literature review and evidence-based field study on the noise effects of high voltage transmission development (May 2016) states the following in relation to noise impacts associated with 110kVA substation installations:

“The survey on the 110kV substation at Dunfirth indicated that measured noise levels (LAeq) were less than 40dB(A) at 5m from each of the boundaries of the substation. This is below the WHO night-time free-field threshold limit of 42dB for preventing effects on sleep and well below the WHO daytime threshold limits for serious and moderate annoyance in outdoor living areas (i.e. 55dB and 50dB respectively). Spectral analysis of the data recorded at this site demonstrated that there were no distinct tonal elements to the recorded noise level. To avoid any noise impacts from 110kV substations at sensitive receptors, it is recommended that a

minimum distance of 5m is maintained between 110kV substations and the land boundary of any noise sensitive property.”

The substation installation will have comparable noise emissions to the 110 kV unit discussed above and considering the nearest noise sensitive locations, which are those along Ballynattin Road (the R772) at a distance of 275 m, the noise emissions from the substation will be inaudible at the nearest NSLs.

The resultant noise effect is stated to be **neutral, imperceptible** and **long term**.

9.5.2.2 Underground Cable

Due to the fact that the proposed 110 kV lines will be located underground there are no operational operation noise impacts associated with the Proposed Development. Mitigation measures are therefore not required.

The resultant noise effect is stated to be **neutral, imperceptible** and **long term**.

9.6 REMEDIAL AND MITIGATION MEASURES

9.6.1 Construction Phase

With regard to construction activities, reference has been made to BS5228 Parts 1 and 2, which offer detailed guidance on the control of noise and vibration from demolition and construction activities. Various mitigation measures will be considered and applied during the construction of the proposed development. As an example, the following measures will be implemented on site:

- limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- establishing channels of communication between the contractor/developer, Local Authority and residents;
- appointing a site representative responsible for matters relating to noise and vibration;
- monitoring levels of noise and/or vibration during critical periods and at critical sensitive locations; and
- all site access roads will be kept even so as to mitigate the potential for vibration from lorries.

Furthermore, a variety of practicable noise control measures will be employed, such as:

- selection of plant with low inherent potential for generation of noise and/ or vibration;
- erection of barriers as necessary around items such as generators or high duty compressors;
- situate any noisy plant as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary.

The vibration from construction activities to off-site residences will be limited to the values set out in Table 9.3. It should be noted that these limits are not absolute rather they provide guidance as to magnitudes of vibration that are very unlikely to cause cosmetic damage. Magnitudes of vibration slightly greater than those in the table are

normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Where there is existing damage these limits may need to be reduced by up to 50%.

Appendix 9.2 presents an indicative construction noise and vibration management plan that will be implemented in terms of the day-to-day operation of the site. This will focus on opening and maintaining lines of communication with the local community to address issues in relation to noise and/or vibration and to advise the community of periods where specific activities take place that have an increased potential in giving rise to issues off site.

9.6.2 Operational Phase

As the operational noise effect associated with the proposed development is *imperceptible*, mitigation measures are not required.

9.7 RESIDUAL EFFECTS OF THE PROPOSED DEVELOPMENT

This section summarises the likely noise and vibration impact associated with the proposed development, taking into account the mitigation measures.

9.7.1 Construction Phase

During the construction phase of the proposed development there will be some impact on nearby noise sensitive properties due to noise emissions from site traffic and other activities. The application of noise limits and hours of operation (i.e. as per Table 9.3, along with implementation of appropriate noise and vibration control measures, as summarised in Section 9.6.1), will ensure that the residual noise and vibration effect is kept to a minimum.

During periods where the works along the grid connection route are close to noise sensitive locations, the construction the residual noise effects are expected to be negative, significant, but brief, as the works will progress along the route.

For the majority for the construction phase and activities, the overall residual noise effects are *negative, slight* and *temporary* in duration.

9.7.2 Operational Phase

As the operational noise impact associated with the proposed development is *neutral, imperceptible* and *long term*, there are no residual noise or vibration effects associated with the proposed development.

9.8 CUMULATIVE IMPACTS OF THE PROPOSED DEVELOPMENT

The potential for cumulative impact (as far as practically possible) of the Proposed Development with any/all relevant planned, existing or permitted developments as set out in Chapter 2, Section 2.8 and 2.9 of the EIAR, unless otherwise stated. The likelihood of cumulative effects are discussed in Sections 9.8.1 and 9.8.2 below for construction and operational phases.

9.8.1 Construction Phase

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified the only simultaneous construction projects capable of combining with the Permitted Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed Development to combine with the construction phase of the Biofuel Facility proposed under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

Permitted ICT Facility WCC Reg. Ref. 20/1088; is subject to the Environmental Impact Assessment Report and planning conditions which include appropriate mitigation measures to minimise environmental impacts. Furthermore, Condition 8 of WCC Reg. Ref. 20/1088 requires the works contractor to provide a detailed Construction Environmental Management Plan (CEMP) for the Permitted ICT Facility. The CEMP for the Permitted ICT Facility will ensure that this project will be managed in an environmentally safe and organised manner by the Contractor.

The proposed Biofuel Facility under WCC Reg. Ref. 21/677 (Subject to Appeal PL27.312181) is similarly subject to an Environmental Impact Assessment Report which includes appropriate mitigation measures to minimise environmental impacts. The proposed Biofuel Facility application included an outline Construction Management Plan (CMP). The CMP for the proposed Biofuel Facility will ensure that this project will be managed in a safe and organised manner by the Contractor.

While there is the potential for cumulative impacts between the Proposed Development and the developments mentioned above during a simultaneous construction phase, the noise effects at the closest noise-sensitive locations to the ICT and Biofuel sites remains to be negative, slight, and temporary, for a number of reasons;

- the smaller scale of the substation works in comparison with the ICT facilities;
- the additional distance from the houses at Ballynattin to the ICT facilities, in comparison with the substation, and
- any noise effects due to the construction route, will, for the majority of the time, be at houses which are at greater distances from the ICT Facility site.

9.8.2 Operational Phase

There are no operational noise and/or vibration impacts associated with the Proposed Development, hence cumulative impacts do not arise in this instance.

9.9 MONITORING OR REINSTATEMENT

Any requirements for ongoing monitoring or reinstatement requirements.

9.9.1 Construction Phase

It is required that the appointed contractor monitor levels of noise and vibration during the construction phase at nearby sensitive locations and/or development site boundaries.

9.9.2 Operational Phase

Not applicable.

9.10 REFERENCES

- EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIA Reports) (2022) and draft revised Guidelines on information to be contained in Environmental Impact Statements; and Advice Notes for preparing EIS (2015).
- 'Guidelines for Environmental Noise Impact Assessment' produced by the Institute of Environmental Management and Assessment (IEMA) (2014).
- British Standard BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise.
- Transport Infrastructure Ireland (TII) publication Guidelines for the Treatment of Noise and Vibration in National Road Schemes.
- British Standard BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration.
- British Standard BS 5228-2: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Vibration.
- BS 4142:2014+A1:2019: Methods for rating and assessing industrial and commercial sound.
- BS 8233:2014: Guidance on sound insulation and noise reduction for buildings.
- Environmental Protection Agencies Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (January 2016).
- ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels.
- British Standard BS 6472 (1992): Guide to Evaluation of human exposure to vibration in buildings (1Hz to 80Hz).
- ISO 9613 (1996): Acoustics – Attenuation of sound outdoors – Part 2: General method of calculation.
- Calculation of Road Traffic Noise (CRTN) issued by the Department of Transport in 1988.

10.0 LANDSCAPE AND VISUAL IMPACT

10.1 INTRODUCTION

This chapter assesses the potential effects of the proposed development on the landscape and views/visual amenity of the receiving environment. It should be read in conjunction with the verified photomontages contained in Appendix 10.1 of the EIAR (under separate cover).

The chapter was prepared by David Bolt (BA (Hons) CMLI) of Model Works Ltd. David has a degree in Landscape Architecture, is a Chartered member of the Landscape Institute (UK) and a qualified PRINCE2 project manager. He has over 30 years' experience in development and environmental planning, masterplanning and landscape design, and is a landscape expert witness.

10.2 METHODOLOGY

This chapter was prepared with reference to the Landscape Institute's *Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, 2013* (GLVIA) and the EPA *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022*.

10.2.1 Key Principles of the GLVIA

10.2.1.1 Use of the Term 'Effect' vs 'Impact'

The GLVIA requires that the terms 'impact' and 'effect' be clearly distinguished and consistently used. 'Impact' is defined as the action being taken, e.g. the introduction to the landscape of buildings, infrastructure or landscaping. 'Effect' is defined as the change resulting from those actions, e.g. change in landscape character or in the composition of a view.

10.2.1.2 Assessment of Both 'Landscape' and 'Visual' Effects

The GLVIA requires that effects on views and visual amenity be assessed separately from the effects on landscape, although the two topics are inherently linked.

'Landscape' results from the interplay between the physical, natural and cultural components of our surroundings. Different combinations and spatial distribution of these elements create variations in landscape character. Landscape impact assessment identifies the changes to this character which would result from the proposed development and assesses the significance of those effects on the landscape as a resource.

Visual impact assessment is concerned with changes that arise in the composition of available views, the response of people to these changes and the overall effects on the area's visual amenity.

10.2.2 Methodology for Landscape Impact Assessment

Assessment of potential landscape effects involves (a) classifying the sensitivity of the landscape resource, and (b) describing and classifying the magnitude of landscape change which would result from the development. These factors are then combined to arrive at a classification of significance of the effects.

10.2.2.1 Landscape Sensitivity

The sensitivity of the landscape is a function of its land use, patterns and scale, visual enclosure and the distribution of visual receptors, and the value placed on the landscape. The nature and scale of the development in question is also taken into account, as are any trends of change, and relevant policy. Five categories are used to classify sensitivity.

Table 10.1: *Categories of Landscape Sensitivity*

Sensitivity	Description
Very High	Areas where the landscape exhibits very strong, positive character with valued elements, features and characteristics that combine to give an experience of unity, richness and harmony. The landscape character is such that its capacity to accommodate change is very low. These attributes are recognised in policy or designations as being of national or international value and the principal management objective for the area is protection of the existing character from change.
High	Areas where the landscape exhibits strong, positive character with valued elements, features and characteristics. The landscape character is such that it has limited/low capacity to accommodate change. These attributes are recognised in policy or designations as being of national, regional or county value and the principal management objective for the area is the conservation of existing character.
Medium	Areas where the landscape has certain valued elements, features or characteristics but where the character is mixed or not particularly strong, or has evidence of alteration, degradation or erosion of elements and characteristics. The landscape character is such that there is some capacity for change. These areas may be recognised in policy at local or county level and the principal management objective may be to consolidate landscape character or facilitate appropriate, necessary change.
Low	Areas where the landscape has few valued elements, features or characteristics and the character is weak. The character is such that it has capacity for change; where development would make no significant change or would make a positive change. Such landscapes are generally unrecognised in policy and the principal management objective may be to facilitate change through development, repair, restoration or enhancement.
Negligible	Areas where the landscape exhibits negative character, with no valued elements, features or characteristics. The character is such that its capacity to accommodate change is high; where development would make no significant change or would make a positive change. Such landscapes include derelict industrial lands, as well as sites or areas that are designated for a particular type of development. The principal management objective for the area is to facilitate change in the landscape through development, repair or restoration.

10.2.2.2 Magnitude of Landscape Change

Magnitude of change is a factor of the scale, extent and degree of change imposed on the landscape by a development, with reference to its key elements, features and characteristics (also known as 'landscape receptors'). Landscape receptors include individual aspects of the landscape, e.g. the topography, urban grain or mix of building typologies, which may be directly changed by the development. The surrounding landscape character areas are also receptors whose character may be altered by these changes. Five categories are used to classify magnitude of change.

Table 10.2: *Categories of Magnitude of Landscape Change*

Magnitude of Change	Description
Very High	Change that is large in extent, resulting in the loss of or major alteration to key elements, features or characteristics of the landscape, and/or introduction of large elements considered totally uncharacteristic in the context. Such development results in fundamental change in the character of the landscape.
High	Change that is moderate to large in extent, resulting in major alteration to key elements, features or characteristics of the landscape, and/or introduction of large elements considered uncharacteristic in the context. Such development results in change to the character of the landscape.
Medium	Change that is moderate in extent, resulting in partial loss or alteration to key elements, features or characteristics of the landscape, and/or introduction of elements that may be prominent but not necessarily substantially uncharacteristic in the context. Such development results in change to the character of the landscape.
Low	Change that is moderate or limited in scale, resulting in minor alteration to key elements, features or characteristics of the landscape, and/or introduction of elements that are not uncharacteristic in the context. Such development results in minor change to the character of the landscape.
Negligible	Change that is limited in scale, resulting in no alteration to key elements features or characteristics of the landscape, and/or introduction of elements that are characteristic of the context. Such development results in no change to the landscape character.

10.2.2.3 Significance of Landscape Effects

To classify the significance of effects the magnitude of change is measured against the sensitivity of the landscape using the guide in Table 10.3 below. This matrix is only a guide. The assessor also uses professional judgement informed by their expertise, experience and common sense to arrive at a classification of significance that is reasonable and justifiable.

Table 10.3: *Guide to Classification of Significance of Landscape and Visual Effects*

		Sensitivity of the Landscape/View				
		Very High	High	Medium	Low	Negligible
Magnitude of Change to the Landscape/View	Very High	Profound	Profound to Very Significant	Very Significant to Significant	Moderate	Slight
	High	Profound to Very Significant	Very Significant	Significant	Moderate to Slight	Slight to Not Significant
	Medium	Very Significant to Significant	Significant	Moderate	Slight	Not Significant
	Low	Moderate	Moderate to Slight	Slight	Not significant	Imperceptible
	Negligible	Slight	Slight to Not Significant	Not significant	Imperceptible	Imperceptible

10.2.3 Methodology for Visual Impact Assessment

Assessment of visual effects involves identifying a number of representative viewpoints in the site's receiving environment, and for each one of these: (a) classifying the viewpoint sensitivity, and (b) classifying the magnitude of change which would result in the view. These factors are combined to arrive at a classification of significance of the effects on each viewpoint.

10.2.3.1 Sensitivity of the Viewpoint/Visual Receptor

Viewpoint sensitivity is a function of two main considerations:

- Susceptibility of the visual receptor to change. This depends on the occupation or activity of the people experiencing the view, and the extent to which their attention is focused on the views or visual amenity they experience at that location. Visual receptors most susceptible to change include residents at home, people engaged in outdoor recreation focused on the landscape (e.g. trail users), and visitors to heritage or other attractions and places of community congregation where the setting contributes to the experience. Visual receptors less sensitive to change include travellers on road, rail and other transport routes (unless on recognised scenic routes), people engaged in outdoor recreation or sports where the surrounding landscape does not influence the experience, and people in their place of work or shopping, where the setting does not influence their experience.
- Value attached to the view. This depends to a large extent on the subjective opinion of the visual receptor but also on factors such as policy and designations (e.g. scenic routes, protected views), or the view or setting being associated with a heritage asset, visitor attraction or having some other cultural status (e.g. by appearing in arts).

Five categories are used to classify a viewpoint's sensitivity.

Table 10.4: Categories of Viewpoint Sensitivity

Sensitivity	Description
Very High	Iconic viewpoints (views towards or from a landscape feature or area) that are recognised in policy or otherwise designated as being of national value. The composition, character and quality of the view are such that its capacity for change is very low. The principal management objective for the view is its protection from change.
High	Viewpoints that are recognised in policy or otherwise designated as being of value, or viewpoints that are highly valued by people that experience them regularly (such as views from houses or outdoor recreation features focused on the landscape). The composition, character and quality of the view may be such that its capacity for accommodating change may or may not be low. The principal management objective for the view is its protection from change that reduces visual amenity.
Medium	Views that may not have features or characteristics that are of particular value, but have no major detracting elements, and which thus provide some visual amenity. These views may have capacity for appropriate change and the principal management objective is to facilitate change that does not detract from visual amenity, or which enhances it.
Low	Views that have no valued feature or characteristic and where the composition and character are such that there is capacity for change. This category also includes views experienced by people involved in activities with no particular focus on the landscape. For such views the principal management objective is to facilitate change that doesn't detract from visual amenity or enhances it.
Negligible	Views that have no valued feature or characteristic, or in which the composition may be unsightly (e.g. in derelict landscapes). For such views the principal management objective is to facilitate change that repairs, restores or enhances visual amenity.

10.2.3.2 Magnitude of Change to the View

Classification of the magnitude of change takes into account the size or scale of the intrusion of development into the view (relative to the other elements and features in the composition, i.e. its relative visual dominance), the degree to which it contrasts or integrates with the other elements and the general character of the view, and the way in which the change will be experienced (e.g. in full view, partial or peripheral view, or in glimpses). It also takes into account the geographical extent of the change, as well as the duration and reversibility of the visual effects. Five categories are used to classify magnitude of change to a view:

Table 10.5: Categories of Magnitude of Visual Change

Magnitude of Change	Description
Very High	Full or extensive intrusion of the development in the view, or partial intrusion that obstructs valued features or characteristics, or introduction of elements that are completely out of character in the context, to the extent that the development becomes dominant in the composition and defines the character of the view and the visual amenity.
High	Extensive intrusion of the development in the view, or partial intrusion that obstructs valued features, or introduction of elements that may be considered uncharacteristic in the context, to the extent that the development becomes co-dominant with other elements in the composition and affects the character of the view and the visual amenity.
Medium	Partial intrusion of the development in the view, or introduction of elements that may be prominent but not necessarily uncharacteristic in the context, resulting in change to the composition but not necessarily the character of the view or the visual amenity.
Low	Minor intrusion of the development into the view, or introduction of elements that are not uncharacteristic in the context, resulting in minor alteration to the composition and character of the view but no change to visual amenity.
Negligible	Barely discernible intrusion of the development into the view, or introduction of elements that are characteristic in the context, resulting in slight change to the composition of the view and no change in visual amenity.

10.2.3.3 Significance of Visual Effects

As for landscape effects, to classify the significance of visual effects, the magnitude of change to the view is measured against the sensitivity of the viewpoint, using the guide in Table 10.3 above.

10.2.4 Quality of Effects

In addition to predicting the significance of the effects, EIA methodology requires that the quality of the effects be classified as positive/, neutral, or negative.

For landscape to a degree, but particularly for visual effects, this is an inherently subjective exercise. This is because landscape and visual amenity are *perceived* by people and are therefore subject to differences in attitude and values - including aesthetic preferences - of the receptor. One person's attitude to a development may differ from another person's, and thus their response to the effects of a development on a landscape or view may vary.

Additionally, in certain situations there might be policy encouraging a particular development in an area, in which case the policy is effectively prescribing landscape and visual change. If a development achieves the objective of the policy the resulting effect might be considered positive, even if the landscape character is profoundly

changed. The classification of quality of landscape and visual effects should seek to take these variables into account and provide a reasonable and robust assessment.

10.2.5 Photomontage Methodology

Model Works Ltd. have produced 7 no. photomontages. The photomontage methodology is based on the Landscape Institute advice note 01/11 Photography and Photomontage in Landscape and Visual Impact Assessment. The method has five main steps:

- Photography
- Survey
- 3D Modelling and Camera Matching
- Rendering and Finishing of Photomontages
- Presentation

10.2.5.1 Photography

Date, Time and Conditions

The photography is timed so that the scene conditions, weather conditions and sun position allow - as far as possible - for a clear and representative baseline photograph to be captured. The date and time of each photograph are recorded so that the sun position can be accurately portrayed in the render of the 3D model.

Camera

The photographs were taken using a Canon EOS5D Mark II camera with a 21 mega pixel sensor and image resolution of 5616 x 3744 pixels. At each viewpoint the camera was positioned on a tripod with the lens 1.65m above ground level (the level of the average adult's eyes), directed at the site and levelled in the horizontal and vertical axes.

Lenses

Prime lenses (fixed focal length with no zoom function) are used as this ensures that the image parameters for every photograph are the same and that all photographs taken with the same lens are comparable. For close-up to middle distant views a 24mm prime lens is normally usually used. This lens captures a field of view of 73 degrees. This relatively wide field of view is preferred for the purpose of Landscape and Visual Impact Assessment as it shows more of the context landscape surrounding a site. For distant viewpoints a 50mm prime lens may be used, capturing a 39 degree horizontal field of view.

10.2.5.2 Survey

The coordinates of each viewpoint/camera position, including the elevation, were recorded using a survey grade GPS receiver, the Trimble Geo7X, which is accurate to within 1cm. For each viewpoint, the coordinates of several static objects in the view are also surveyed (e.g. lamp posts, bollards, corners of buildings, etc.). The coordinates of these 'markers' are used as reference points later in the process, to ensure that the direction of view of the cameras in the 3D model matches the direction of view of the photographs.

10.2.5.3 3D Model and Camera Matching

Creation of 3D Model

Using the information contained in the design team's drawings, a 3D model of the proposed development was built in the software package Autodesk 3DS Max. The 3D model is georeferenced to a survey drawing of the site and receiving environment.

3D Camera Positions

The surveyed camera positions and the markers for each view are inserted into the 3D model, with information on the focal length of the lens attributed to each camera. For each camera/view, the date and time is set to match those of the original photograph. This ensures that the direction of sunlight and shadows in the 3D model match those of the photographs.

Camera Matching

The photographs are then inserted as backdrops to the views of each camera in the 3D model. The direction of view of the cameras in the 3D model are matched with the direction of view of the photographs using the surveyed markers. This ensures that the camera positions, the direction of the views and the focal length of the cameras in the 3D models are accurate, so that the proposed (final) development appears in the correct position and scale when montaged into the photographs.

10.2.5.4 Rendering of 3D Model and Finishing of Photomontages

For each view a render of the development is generated. This is the process of creating a photo-realistic image of the 3D model, as seen from each camera position, with sunlight and shadow applied to the model. The render of the development is then inserted into the photograph to create the photomontage. This involves masking (or cutting out) those parts of the render that are obscured by objects in the foreground of the photograph and masking distant objects behind the render – so that the render fits seamlessly into the photograph.

10.2.5.5 Presentation and Viewing

The individual photomontages are presented on A3 pages in landscape format in Appendix 10.1. For each photomontage, the viewpoint number, location description, and the date and time of photography are provided on the page.

10.3 EXISTING ENVIRONMENT

10.3.1 Development Policy and Landscape Character

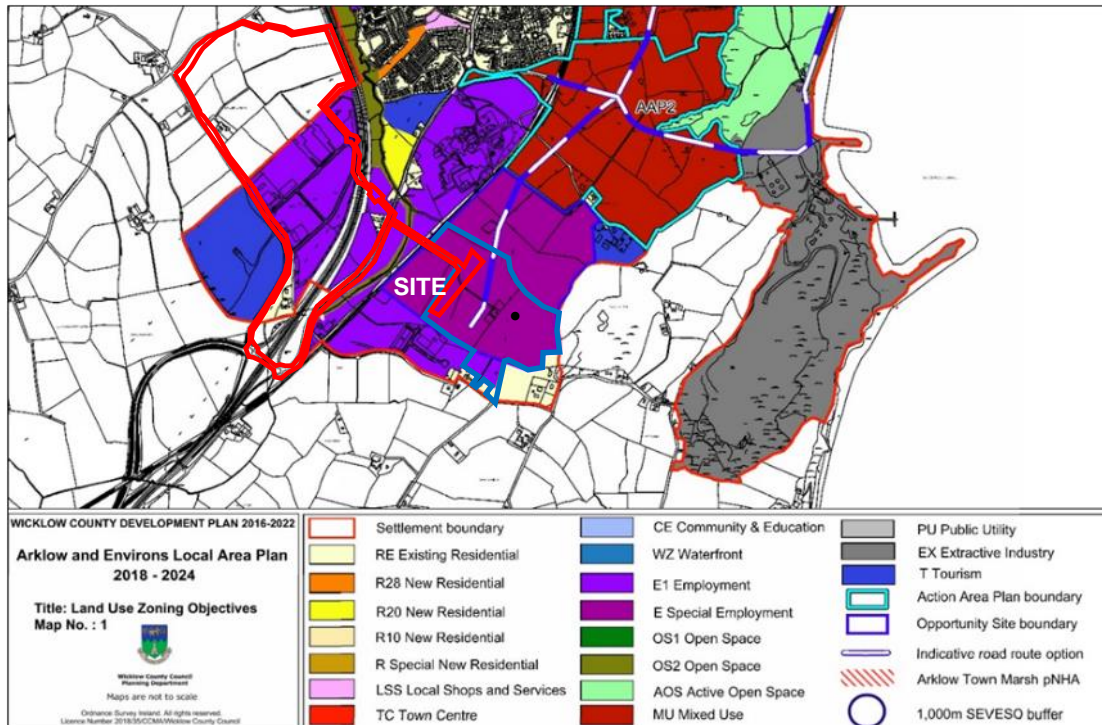


Figure 10.1 Arklow Local Area plan 2018-2024, Map No:1 'Land Use Zoning'

Currently the landscape of the area in the vicinity of the site remains in a peri-urban condition, with the existing employment developments separated by areas of farmland (the future employment development lands). These areas (including the subject site) are characterised by large, undulating fields divided by hedgerows or tree lines.

However, in accordance with the ALAP, the transformation of the southern environs landscape has begun, with employment developments at Kish Business Park adjacent to the south of the site, Servier at Money Little just to the north across the railway line, and the IDA Business Park at Ballynattin to the west across the M11. This development is served by the M11, which passes some 340m to the west of the site, and the Dublin-Rosslare Main Line railway, which passes along a portion of the site's west boundary.

The employment-site developments in the area (existing and envisioned in the ALAP) are typically comprised of large footprint, low buildings of warehouse-type or industrial architecture surrounded by parking and hard standing areas, often within a wider framework of woodland belts for screening and biodiversity. In the medium- to long-term, the site's receiving environment will be characterised by such development. Once fully realised, the area will be industrial in character and will have limited visual amenity value. The landscape will, however, support some biodiversity and deliver other ecosystem services such as surface water attenuation.

10.3.2 The Site and Environs



Figure 10.2 Aerial view of the site's immediate environs (purple shading indicates land zoned for employment development; brown shading is mixed use)

The greenfield site is currently in agricultural use. It comprises a location for a substation for a data centre and the route and siting of underground cables, pylons and associated infrastructure required to connect the substation with the grid.

The data centre is comprised of three structures each approximately 21,136m² in area (307.365m x 166.995m) and 10.35m high, to be located within a site that is currently comprised of four large irregularly shaped fields divided by hedgerows (see Figure 10.2). As suggested by the townland name, the site area is low-lying.



Figure 10.3 View at the entrance of Kish Business Park, towards the site.

The Kish Business Park lies to the south and west of the site. The partially developed business park has five large individual warehousing / factory buildings surrounded by hard standing areas, parking and road infrastructure. Within the business park there are several large, serviced sites currently covered in grass with potential for further development.

The Clogga Road passes to the south of the site and Kish Business Park, forming the boundary between the land zoned for development and a working rural landscape to the south. The western stretch of the road, from where it crosses the railway line to the entrance of the business park, has an urban treatment. The road is flanked by grass verges, a footpath on one side, and formal tree lines. To the east beyond the business park, including where it passes along a part of the site's southern boundary, the road remains rural in character. Along this stretch, mature hedgerows line both sides.



Figure 10.4 A View from the western end of Clogga Road across an undeveloped part of Kish Business Park, towards the site.

There are several linear clusters of houses along the road, including a cluster on either side of the site's southern boundary, where it borders on Clogga Road. A number of these residential properties share a boundary with the Permitted ICT site, and these may be considered the most sensitive receptors to landscape and visual change in the area, even if not directly visible from the site.

The Clogga Road leads towards Arklow Rock headland, the local high point in the landscape, and passes the southern end of a very large quarry which extends to the north (towards the town) above the coastline. There the road turns south and leads to Clogga Beach where there are several mobile home and caravan parks.

South of the Clogga Road (the future boundary of the urban area) the land use is agricultural, with farm houses widely dispersed in the rural landscape.

To the west of the 110 kV Substation site and Kish Business Park there is a broad transport corridor, including the railway line, the R772 (the main road into Arklow from the south) and the M11. Junction 21 is just to the south west of the site, where the R772 meets the M11. There is an equestrian centre and a small cluster of houses along the R772 to the southwest of the site, although the houses are separated from the site by the railway line and a large field zoned for employment development.

The lands to the north of the site, both sides of the railway line and along the R772, are all zoned for employment and mixed use development. The Servier pharmaceutical plant is located in this area, between the railway line and the R772.

To the north east of the site (approximately 400m from the site) is the Moneylands Farm B&B and café. East of Moneylands and the site a broad belt of agricultural land is to be retained as a green belt between the future urban/employment area and the quarry along the coast. Within this area, east of the site is Rock Little, a scrubby outcrop associated with the Felsic volcanics (Arklow Head Formation) and the larger Roadstone Quarry at Arklow Rock in the townland of Askintinny.



Figure 10.5 View of Arklow Mountains and wind turbines from Ballyduff Road, near pylon site.



Figure 10.6 View to the south from Ballyduff Road South, northwest of the pylon site.

To the west of the M11, is the Arklow Business Park, which is as yet relatively undeveloped. The landscape is more emphatically rural in nature, with fields enclosed by hedgerows containing mature broadleaf trees, including ash, oak and sycamore, and views to the Arklow hills to the west. There are a number of working farmsteads and residential properties on the Ballyduff Road South and Knockenrahan, within which commercial business premises are located. Power and communication infrastructure cross the fields, aligning in particular with Knockenrahan.



Figure 10.7 View from Pylons site from Knockenrahan, looking southwest.

10.3.3 Development Policy

The site is located within a large area zoned for employment development, and is specifically zoned for ‘Special Employment’, i.e. a large, single, undivided employment development such as ‘significant IT’, including data centres.

Additionally, the site is located within the Arklow Urban Area in the Landscape Category Map contained in the Landscape Assessment in Appendix 5 of the WCDP Appendix 5. Regarding these areas, the Landscape Assessment states: *“In terms of landscape classification, these settlements have already been deemed suitable for development (of the type allowed by the settlement strategy and the development standards of this plan) and the impacts on the wider landscape of such development has already been deemed acceptable”.*

While the WCDP and the ALAP effectively prescribe the land use change – and therefore the landscape change – proposed, the following policy is nonetheless relevant:

EMP4 “To permit proposals for employment generating development where it can be demonstrated that the development complies with the relevant development standards and is not detrimental to residential amenity or to environmental quality, and is acceptable with regard to its impact on the character and visual amenity of the area... Developments that result in an unacceptably high level of traffic generation, that are detrimental to residential amenity, the character or visual amenity of an area or the existing roads infrastructure will not be permitted”.

EMP11 “To require employment based developments to be of the highest standard of architectural design and layout and comply with the Development & Design Standards set out in this plan”.

10.3.3.1 Landscape Mitigation

NH1 “To ensure that the impact of new developments on biodiversity is minimised and to require measures for the protection and enhancement of biodiversity in all proposals for large developments”.

FL5 “To require all new developments to include proposals to deal with rain and surface water collected on site and where deemed necessary, to integrate attenuation and SUDS measures”.

NH19 *“To encourage the retention, wherever possible, of hedgerows and other distinctive boundary treatment in the County. Where removal of a hedgerow, stone wall or other distinctive boundary treatment is unavoidable, provision of the same type of boundary will be required of similar length and set back within the site in advance of the commencement of construction works on the site (unless otherwise agreed by the Planning Authority)”.*

10.3.3.2 Coastal Areas of Outstanding Natural Beauty

A Coastal Area of Outstanding Natural Beauty - the Southern Coastal Area - is located along the coastline to the east of the site. This area is considered a landscape of Very High Vulnerability.

2(b) - The Southern Coastline

“The southern coastline comprises of lands south of Wicklow Town... extending as far as south of Arklow Rock. This area comprises of the main sandy beaches of Brittas, Ennereilly and Clogga and provides for a continuous prospect and numerous views from the coast road out to sea. Sand dunes are dominant in sections of the area forming a number of important environmental designations such as Maherabeg Dunes and Buckronev-Brittas Dunes and Fen (NHA and SAC) and Arklow Rock/Askintinny NHA. These areas are important not just from a landscape or habitat perspective, but also are increasingly important for recreational activities, the development and promotion of which must be managed appropriately. Development proposals within this landscape area should be evaluated to ensure natural heritage, views, prospects are adequately protected in accordance with relevant requirements of statutory authorities”.

10.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The full description of the scheme to be published on the planning notice is as follows:

“In accordance with Section 182A of the Planning and Development Act 2000 (as amended) Crag Wicklow Limited, gives notice of its intention to make an application for permission/approval to An Bord Pleanála in relation to the proposed development described below.

The proposed development primarily comprises the provision of a new 110 kV substation with Gas Insulated Switchgear (GIS) technology and two 110 kV underground transmission cables (connecting to existing 220 kV overhead lines to the northwest of the proposed substation) along with associated and ancillary works. The proposed development is located within the townlands of Bogland, Kish, Cooladangan, Ballintombay, Ballyrooaun, and Ballynattin, Co. Wicklow. The site of the proposed development has an area of c. TBC hectares.

The development primarily is described as follows:

- *The proposed 110kV GIS Substation is to be located on lands to the northwest of the ICT facility development permitted under Wicklow County Council Reg. Ref.:20/1088, within an overall landholding bound to the south / southwest by the existing Kish Business Park, to the southeast by dwellings and Kish Road, to the west by the Dublin-Rosslare railway line (beyond which is the R772 and the M11), and to the east and north by agricultural lands.*
- *The proposed substation compound is subdivided into two parts. The southern part of the compound will accommodate and a two storey 110kV GIS substation*

building (with a gross floor area of c. 1,299 sq.m). The northern part of the compound will accommodate four transformers and a single storey client control building (with a gross floor area of c. 419 sq.m) and associated underground services. Both parts of the substation compound are enclosed within c. 2.4 metre high security fencing.

- *The proposed dropdown 110kV transmission lines will connect the proposed 110kV GIS substation building to existing 110kV overhead transmission lines to the northwest of the proposed substation (the Arklow Banoge 110kV overhead line) and will comprise the provision of two dropdown masts (c. 17 metres in height) and associated overhead transmission line connections, transitioning to underground transmission lines set within ducts that will subsequently progress into the 110kV GIS substation building.*
- *The proposed 110kV transmission line will primarily run through undeveloped lands, agricultural lands, and via public roads between the proposed 110kV GIS substation and existing Arklow – Banoge overhead lines to the northwest of the site.*
- *The transmission lines form a loop that will be divided into two circuits, Circuits A and B. Proposed Circuit A proceeds from the site of the proposed 110kV GIS substation westwards, crossing the nearby railway line, then proceeds south-west along the R772 to cross the Moneylane Stream and crosses underneath the M11 motorway at Junction 21, then proceeds along the L6187, enters agricultural lands adjacent to Knockeneahan Road, and terminates at the existing 110 kV Arklow – Banoge overhead line. Proposed Circuit B proceeds from the site of the proposed 110kV GIS substation westwards, crossing the nearby railway line, the Moneylane Stream, the R772, and the M11, then traverses lands within the Arklow IDA Business Park, and open agricultural lands adjacent to the M11 and Knockeneahan Road (L2190) and terminates at the existing 110 kV Arklow – Banoge overhead line.*
- *The development includes adjacent access paths, connections to the substation and to the overhead lines, removal of redundant overhead lines, landscaping and landscape screening to the proposed GIS substation compound, security fencing, provision of internal access roads and car parking (9 no. spaces) within the substation compound, services, all associated construction works, and all ancillary works.”*

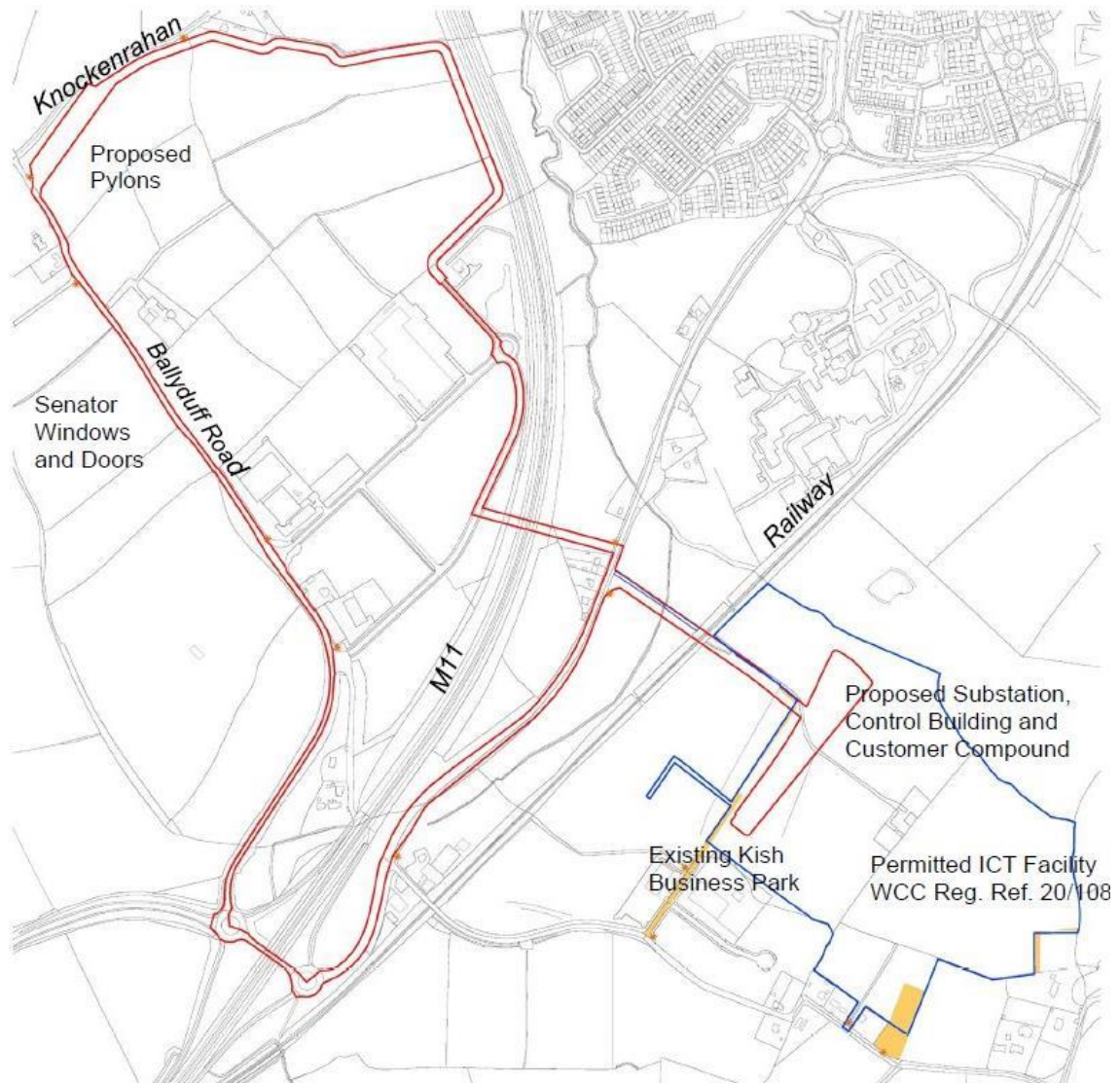


Figure 10.8 Excerpt of proposed site masterplan drawing, no. DUB30-02-ZZZ-L00-DR-RAU-AR-1001_OS MAP.

With regard to potential landscape and visual impacts, the key characteristics of the proposal are as follows:

10.4.1 Layout

With reference to Figure 10.8, the single rectangular 110 kV Substation building (and ancillary structures and plant) is laid out perpendicular alongside permitted ICT Building 1 to the north west and is separated from them and surrounded by internal access roads. This orthogonal layout is the most efficient possible arrangement of the buildings on the site.

The layout also responds to local topography and is located at the lowest point of the site as a whole. The elevation of the permitted ICT buildings drop from the SE towards the NW, which are terraced to accommodate the large footprint buildings with no split levels internally.

10.4.2 Buildings

The proposed buildings comprise an enclosed 110 kV Substation of 43.3m in length, 12.2m width and 14.45m height, a Control Building of 39.22m in length, 11.755m width and 6.025m height, and Customer Compound containing 4 consumer units of over of approx. 45m x 18.6m.

The substation complex is located to the north west of the main permitted ICT buildings, which have a footprint of approximately 308 m long and 67 m wide each and are, although characteristic of the development type, on a different order of scale. However, at c. 10.4m, the permitted ICT buildings similar in height to the tallest of the substation structures (approximately the parapet height of a three storey apartment building). In combination with the low-lying topography of the site, juxtaposition to the permitted ICT facility structures, and existing surrounding woodland and hedgerows, the substation buildings and associated infrastructure would limit the extent of their visual influence on the surroundings.

The substation and Control Building would be clad in similar facing material to the permitted ICT facility buildings, namely graduated mid to dark grey, although the final colour selection will, it is envisaged, be subject to planning conditions.



Figure 10.9 View of proposed Substation and Control Building

10.4.3 Landscaping

Due to the site's irregular shape, the orthogonal arrangement of the 110 kV Substation and adjacent permitted ICT facility buildings and infrastructure would result in several areas surrounding the buildings being unused. These spaces provide opportunity for landscaping with the dual function of visual screening and biodiversity enhancement and would be integrated with that that has been proposed for the permitted ICT facility buildings.

The proposed development includes belts of woodland vegetation within these areas. The location of the proposed woodland belts was informed by the Landscape and Visual Impact Assessment, with the intention of (a) maximising the screening effect for the most sensitive visual receptors (the residential properties to the south, south east and west), and (b) maximising the biodiversity value, by connecting to the network of hedgerows around the site.

The remainder of these unused areas, together with an area reserved for expansion, would be maintained as wild flower meadow, providing additional habitat with minimal maintenance requirement.

10.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

10.5.1 Landscape Impacts

10.5.1.1 *Landscape Sensitivity*

Although currently in agricultural use the site is located within an area zoned for employment development, and is specifically zoned for 'Special Employment', which includes data centres. The site is surrounded on three sides (north, west and south west) by lands similarly zoned, and the area's transformation has begun: There is existing employment development adjacent to the south west (Kish Business Park) and north (Servier), as well as to the west beyond the railway line and M11 motorway.

Additionally, the site is classified as 'urban area' in the WCDP Landscape Assessment. These are the areas of (generally) lowest landscape sensitivity in the county. The Landscape Assessment states that these areas "have *already been deemed suitable for development* of the type allowed by the settlement strategy [i.e. their zoning] and the development standards of this plan and the impacts on the wider landscape of such development has already been deemed acceptable".

The landscape sensitivity to the proposed development is therefore not high. However, there are some elements/aspects of higher sensitivity in the area, which must be considered in the site's development, including:

- The nearby residential properties along the Clogga Road, some of which share a boundary with the site. Any development on the site should seek to avoid causing visual impacts which would substantially affect the residential amenities of these properties.
- The Coastal Area of Outstanding Natural Beauty to the east and south east (Clogga Beach). The AONB designation is primarily to protect the coastal corridor itself from inappropriate development, and to preserve views from the coast roads towards the sea. The site is inland from the coastal area and therefore cannot affect it directly; nonetheless, the potential indirect effect on the AONB should be considered.
- The site's hedgerows. The site includes mature hedgerows along internal field boundaries and around the perimeter. While hedgerows will inevitably be lost in the site's development, the WCDP effectively requires that compensatory planting be included in developments to enhance biodiversity wherever possible.

Overall, the landscape sensitivity of the receiving environment to the proposed development can be considered low-medium (refer to Table 10.1 above).

10.5.1.2 *Magnitude of Landscape Change*

The site would be fundamentally changed by the development. The topography would be altered, and the grassland fields and mature hedgerows removed (erasing the long-standing field pattern) and replaced by industrial scale buildings and ancillary infrastructure. While the impact would be of high magnitude on the site itself, at the wider scale (landscape scale) the development would be in keeping with the plan-driven trend of change towards an urban area dominated by employment uses.

Overall, the magnitude of change to the landscape would be low-medium (refer to Table 10.2 above).

10.5.1.3 Significance of Landscape Effects

Considering the magnitude of change and the sensitivity of the receiving environment (refer to Table 10.3), the significance of the potential landscape effects can be classified 'slight' and neutral.

The development would cause a shift in landscape character, from the current peri-urban condition towards employment-dominated urban. It would contribute to the realisation of the development strategy for the area and can therefore be considered a neutral change.

10.5.2 Visual Impacts

10.5.2.1 Potential Visual Receptors

The number and distribution of potential visual receptors in the receiving environment, and their degree of exposure to the site, is relatively limited. This is due to a number of factors including (a) the low-lying topography of the site combined with few publicly accessible elevated vantage points in the area; (b) the site's removal from the public road network (which additionally is sparse in the area, so there are few journeys made around the site); (c) the sparsity of existing development (particularly residential development) in the area – there are no houses close to the site to the west, north or east.

South of Site

The most sensitive potential receptors are the users of Clogga Road to the south and south east of the site. Users access residential properties that share a boundary with the permitted ICT facility site, of which they could potentially have views, but this would fully screen any sight of the substation compound. The landscape south of the road is a sparsely populated rural area, with few receptors.

East of Site

To the east of the low-lying site the land rises towards Rock Little and Arklow Rock, but there are no publicly accessible vantage points in these elevated areas, and few dwellings. There are several dwellings along the Clogga Road to the east of the site, as it rises towards Arklow Rock, but the local topography and roadside vegetation combine to restrict views towards the site. The permitted ICT facility buildings would again fully screen any potential visibility from the east.

West of Site

The railway line passes to the west of the site. Beyond the railway and a strip of fields (zoned for employment development) is the R772. There is a small cluster of houses on the R772, directly west of the permitted ICT facility site, which would not be visually exposed to the proposed development. The M11 passes a short distance further west, and traffic travelling south on the motorway may have intermittent views towards the site through the roadside planting. Potential for visibility of the substation compound does exist, but as the site is low-lying and back clothed by the larger mass of the permitted ICT facility buildings, the proposed 110kV Substation compound would be enveloped within the wider built environment.

North of Site

The lands north of the site and east of the railway line are in agricultural use but are zoned for employment development. There are few potential visual receptors in this area, except for one farm house (enclosed by trees, with no view towards the site) and

the Moneylands B&B and cafe, which again will be largely screened from views of the substation compound by the permitted ICT facility buildings.

10.5.2.2 Viewpoints for Visual Effects Assessment

Seven viewpoints representative of the receiving environment were selected for visual impact assessment informed by verified photomontages. The viewpoints were selected to represent the range of potential visual receptors in terms of sensitivity, as well as views from various angles and distances from the site.

The viewpoints are as follows, and shown on the Figure 10.10 below:

Substation Site (Red tabs)

- **Viewpoint 01:** Clogga Road adjacent to Kish Business Park
- **Viewpoint 02:** Clogga Road to South of the Site;
- **Viewpoint 03:** Kish Business Park access road to South of Site;
- **Viewpoint 04:** Fields to north of site aligned with Kish Business Park access road;

Pylon Site (Yellow tabs)

- **Viewpoint 01:** Ballyduff Road, near Senator Windows and Doors;
- **Viewpoint 02:** Farmstead west of the site;
- **Viewpoint 03:** Knockenrahan, looking northeast.



Figure 10.10 Location of viewpoints for visual impact assessment

The viewpoints are individually assessed below. The assessments should be read in conjunction with the baseline photographs and photomontages contained in Appendix 11-1. For the assessment methodology and terminology refer to 10.2.3 above.

Proposed Substation (see red labels on Fig 10.16)

10.5.2.3 Substation Viewpoint 01: Clogga Road adjacent to Kish Business Park

Existing View

Currently: Where the Clogga Road bridges the railway line, it is elevated for a short stretch, providing a view across an undeveloped part of Kish Business Park towards the site. To the left a wall conceals the railway from view. The existing business park buildings are prominent in the middle distance, with Rock Little and Arklow Rock forming the horizon behind them. Beyond the low-lying lands of Bogland (including the site) the trees around Moneylands Farm are visible.

All lands in view, apart from Rock Little and Arklow Rock, are zoned for employment development. The Clogga Road forms the southern boundary of this planned urban area and provides the road access to Kish Business Park.

With Permitted ICT Facility: The permitted ICT facility buildings would form a significant element within the baseline, creating a large, relatively featureless horizontal mass of a similar height to the Substation and taller than the Control Building. The permitted ICT facility buildings would sit beyond a lower existing light grey/white pitch-roofed industrial shed, which would partly screen the 110kV Substation and Control Buildings from views from the Clogga Road moving east. The contrasting tones of the buildings would help in breaking up the permitted ICT facility buildings massing, introducing an element of interest.

The viewpoint sensitivity is Low.

Proposed Change

The substation and ancillary structures would be lost within the wider setting of the landscape, and cumulatively inconspicuously juxtaposed with the cluster of long, low permitted ICT facility buildings would be visible in the middle distance, to the side and rear of the existing Kish Business Park buildings. The landscape planting, including trees planted within the permitted ICT facility scheme, would partially screen and anchor the buildings into the landscape over time. The composition and character of the view would not be altered, and the valued elements in the view (the elevated areas to the east and the distant tree line to the north) would remain visible.

The magnitude of change would be Low.

Significance of Visual Effect

The significance of the visual effects would be Slight and neutral. There would be an imperceptible shift in landscape character, as a minor addition to an employment-dominated urban environment, as planned for the area, with an imperceptible reduction in visual amenity.

10.5.2.2 Substation Viewpoint 02: Clogga Road to South of the Site

Existing Views

Currently: Substation View 2 is from Clogga Road entrance to Kish Business Park towards the site, which forms a linear vista along the access road. Large-species street trees planted to either side of the road form the beginnings of a substantial avenue, aesthetically adorning what would otherwise be functional commercial/industrial vehicular infrastructure. The viewpoints represent views which would be experienced by the users of both the business park and local access to the houses further to the east along the Clogga Road, as well as the general traffic passing along the road. It should be noted that the residential properties along this stretch are both enclosed by broad shelter belts of vegetation and screened from potential views of the substation by intervening existing and further structures. It is also material that all the lands in view to the north and west are zoned for employment development.

With Permitted ICT Facility: The permitted ICT facility buildings would form a significant element within the baseline, creating a large, relatively featureless horizontal mass of a similar height to the Substation and taller than the Control Building. The contrasting tones of the buildings would help in breaking up the permitted ICT facility buildings massing, introducing an element of interest. The viewpoint sensitivity is Low.

Therefore the sensitivity of the viewpoints is Low.

Proposed Change

The substation and Control Building may be partially visible, protruding above the roadside tree planting in the distance. The building would be approximately 250m from the viewpoint on the road, at a lower ground level and 14.45m high (the height of a 4 storey residential building). The substation structures would be subsumed by the larger mass and scale of the permitted ICT facility buildings, however. The landscape planting, including trees planted within the permitted ICT facility scheme, would partially screen and anchor the buildings into the landscape over time. Therefore the development would not have a significant presence in the view. The character of the view would also not be substantially changed, as warehouse/factory type buildings already feature in the view.

The magnitude of change would be Low.

Significance of Visual Effect

The significance of the visual effects would be Not Significant and neutral. The change would be consistent with character for the area, prescribed by planning policy, and would have little effect on the visual amenity experienced by sensitive receptors.

It is significant that an area of the site between the proposed 110 kV Substation and the road edge in front of the permitted ICT facility buildings is free of proposed development. This space provides potential for effective mitigation landscaping.

10.5.2.3 Substation Viewpoint 03: Fields to north of site aligned with Kish Business Park access road

Existing View

Currently: Substation View 03 is from the route of the proposed 110 kV Substation access road to the north of the site, aligned with the Kish Business Park access road, towards the site over rough pasture and unkempt hedgerows. The existing area is low-

lying, falling towards a drainage ditch/brook adjacent to a hedgerow that forms an intermediate skyline. The Servier business park buildings can be seen protruding through the hedgerow on the left of the view. Behind (to the south) of the viewpoint, the Servier buildings dominate, providing continuity of the urbanising influence of the developing Kish Business Park. To the left of view in the mid-distance, the collapsing roofs of derelict farm buildings can be seen. In the distance, the land rises towards the Rock Big hill low on the horizon.

With Permitted ICT Facility: The ICT facility buildings would form a significant element within the baseline, creating a large, relatively featureless horizontal mass of a similar height to the Substation and taller than the Control Building. The contrasting tones of the buildings would help in breaking up the permitted ICT facility buildings facility buildings massing, introducing an element of interest.

The impression is that of a rapidly changing and urbanising landscape. The viewpoint sensitivity is Medium.

Proposed Change

The permitted ICT facility development would dominate the view, subsuming the substation control centre and substation by their sheer scale. The service road junction would draw the eye towards the control centre, which would largely screen the substation beyond. Landscape planting provides screening and context to the structures. While the permitted ICT facility buildings result in Profound to Very Significant change, the substation buildings would result in a Low change of the view.

Significance of Visual Effect

The substation buildings would have a Slight Negative effect on the view.

10.5.2.5 Substation Viewpoint 04: Kish Business Park access road to South of Site

Existing View

Currently: Substation View 04 is from the route of the proposed 110kV Substation access road to the south of the site, aligned with the Kish Business Park access road visible in View 2, towards the site over rough pasture and unkempt hedgerows. The existing area is low-lying, falling towards a drainage ditch/brook adjacent to a hedgerow that forms an intermediate skyline. The Servier business park buildings can be seen protruding through the hedgerow on the left of the view. Behind (to the south) of the viewpoint, the existing buildings dominate, and access road provides a clear vista and continuity of the urbanising influence of the developing Kish Business Park. In the distance, the land rises towards the mountains that lie low on the horizon.

With Consented ICT Buildings: The permitted ICT facility buildings would form a significant element within the baseline, creating a large, relatively featureless horizontal mass of a similar height to the Substation and taller than the Control Building. The contrasting tones of the buildings would help in breaking up the permitted ICT facility buildings massing, introducing an element of interest.

The impression is that of a rapidly changing and urbanising landscape.

The viewpoint sensitivity is Medium.

Proposed Change

The proposed development would be central to the viewpoint, screened to an extent by the proposed street trees and shrubs of the permitted ICT facility landscape masterplan. The substation structures would also be subsumed by the larger mass and scale of the permitted ICT facility buildings. The landscape planting, including trees planted within the permitted ICT scheme, would partially screen and anchor the buildings into the landscape over time. Therefore the development would not have a significant presence in the view. The character of the view would also not be substantially changed, as warehouse/factory type buildings already feature in the view. The magnitude of change would be Low.

Significance of Visual Effect

The significance of the visual effects would be Slight and neutral. The change would be consistent with character for the area, prescribed by planning policy, and would have no negative effect on the visual amenity experienced by receptors, who would not be classed as sensitive.

It is notable that an area of the site between the proposed 110 kV Substation and the road edge in front of the permitted ICT facility buildings is free of proposed development. This space provides potential for effective mitigation landscaping.

The visual effects would be Moderate and negative.

Proposed Pylons (see yellow labels on Fig 10.16)

10.5.2.6 Pylon Viewpoint 01: Ballyduff Road, near Senator Windows and Doors

Existing View

In the existing view north west on the Ballyduff Road from the private residence near Senator Windows and Doors towards the site, road verge vegetation largely screens the subject site. The existing power poles (a double pole power gantry and single pole) prominently break the skyline to the left, and further sets of double poles can be seen receding to the middle distant towards the right of view. In the distance the land rises to the west, towards the Arklow mountains, which form an undulating horizon.

The view is of an agricultural, rural landscape. However, it is dominated by the busy Ballyduff Road, and the lands adjacent to the east (out of view to the left) are zoned for development (see Figures 10.1 and 10.2), adjacent to the M11 motorway and the Kish Business Park beyond to the east. The zoning objective specifically facilitates development of the type proposed, and thus while sensitivity of receptors of the view are high (residential).

The expectation of additional infrastructure to facilitate the new employment areas would reduce the sensitivity to Medium.

Proposed Change

The new latticed metal pylons would be prominent but are an addition to the existing poles which already impart a peri-urban component in the view. The increased prominence of built form in the landscape is reinforced by the additional pylon adjacent

to the existing double pole power gantries in the mid-distance, right of the view, however.

The magnitude of change would be Medium.

Significance of Visual Effect

There would be a shift in landscape character, from rural towards peri-urban and employment-dominated urban, as planned for the area, with an inevitable reduction in visual amenity (resulting from the increase in the proportion of built form to green space).

It should be noted that while there are a number of mature broadleaf trees in the vicinity, many of these are *Fraxinus excelsior* (ash), which are infected by Ash Dieback Disease, and will inevitably be dead within the next two to three years, accentuating the effects of the positioning of the pylons in this location.

10.5.2.7 Pylon Viewpoint 02: Farmstead west of the site on Ballyduff Road

Existing View

Looking east from an access to a dairy unit of the farm on Ballyduff Road, the foreground is dominated by a gravelled laying-up area for farm vehicles, boarded to the north and east by 2-3m high hedgerows. Mature trees bordering the road and lay-up frame the view. The viewpoint represents user of the road, parking area and farmstead, which also includes a residential property or properties, currently surrounded by agricultural land and hedgerow trees.

The hedgerows and trees adjacent to the road limits the extent of the landscape visible and screen the southernmost existing double pole power gantry, although the existing northern-most poles are prominent above the vegetation. The land falls to the left of the view reducing the prominence of the existing power poles.

The viewpoint sensitivity is Low.

Proposed Change

The addition of the northern-most proposed pylon would be visible in the middle distance, protruding above the roadside hedgerow vegetation; the existing mature trees screen the northern-most pylon from view. The proposed pylon would have some prominence in the view, although it would be visually associated with existing double pole power gantry, and therefore not an entirely new form of structure to the area.

The magnitude of change would be Medium.

Significance of Visual Effect

There would be a shift in landscape character, from rural towards peri-urban, as planned for the area, with an inevitable reduction in visual amenity (resulting from the increase in the proportion of built form to green space).

Again, it should be noted that while there are a number of mature broadleaf trees in the vicinity, many of these are *Fraxinus excelsior* (ash), which are infected by Ash Dieback Disease, and will inevitably be dead within the next two to three years, accentuating the effects of the positioning of the pylons in this location.

The significance of the visual effects would be Moderate and negative.

10.5.2.8 Pylon Viewpoint 03: Knockenrahan, looking northeast

Knockenrahan, a busy rural land, dominates the view, which also represents a residential dwelling 50m behind the view point. The house is currently surrounded by agricultural land and hedgerow trees.

In the existing view from Knockenrahan, a hedgerow adjacent to the road limits the extent of the landscape visible, although the existing double pole power gantry is prominent above the vegetation. The land rises towards the crossroads with the Ballyduff Road, placing the existing power poles on a local prominence.

The viewpoint sensitivity is Low.

Proposed Change

The addition of the new pylons would be visible in the middle distance, protruding above the roadside hedgerow vegetation. As they break the skyline, the pylons would have some prominence in the view, although would be visually associated with existing double pole power gantries, and therefore not entirely new forms of structure to the area.

The magnitude of change would be Medium.

Significance of Visual Effect

There would be a shift in landscape character, from rural towards peri-urban, as planned for the area, with an inevitable reduction in visual amenity (resulting from the increase in the proportion of built form to green space).

Again, it should be noted that while there are a number of mature broadleaf trees in the vicinity, many of these are *Fraxinus excelsior* (ash), which are infected by Ash Dieback Disease, and will inevitably be dead within the next two to three years, accentuating the effects of the positioning of the pylons in this location.

The significance of the visual effects would be Moderate and negative.

10.6 REMEDIAL AND MITIGATION MEASURES

No significant visual effects have been identified, and the proposal would contribute to the planned urbanisation of the Arklow southern environs, where an extensive expansion of the town is envisioned, with employment the predominant use.

Despite the development's compliance with the policy for the area, some local receptors would experience a negative effect on visual amenity. These include a small number of houses near the pylon site (to the east and west on Ballyduff South road and south along Knockenrahan. The WCDP requires (see 10.3.2 above) that such effects be minimised to maintain an acceptable degree of residential amenity and environmental quality. The WCDP also requires large development proposals to include measures for the protection and enhancement of biodiversity.

It was therefore recommended that a Landscape Plan be prepared for the site to coordination with that prepared for the permitted ICT facility site), to include the following:

- Measures for the protection of the site perimeter hedgerows during construction;
- Proposals for supplementary planting to the perimeter hedgerows, to fill any gaps and maximise the habitat value and visual screening potential of the hedgerows;
- Proposals for the establishment and management of belts of woodland in the unused parts of the site around the buildings, particularly to the west, south and south east where there is potential for effective visual screening to reduce the effects on nearby residential properties;
- Proposals for the establishment and management of wildflower meadow in the remaining unused parts of the site, and in the green strips between the buildings;
- Measures to anticipate the demise of ash trees, including the felling and removal of affected specimens, and replanting of trees that will attain similar size without the risk of reinfection (i.e., beech, oak sycamore or lime).

The implementation of the Landscape Plan would have significant benefits to (a) the site's biodiversity, by expanding, connecting and diversifying habitats, and (b) the occupants of nearby residential properties, by screening the buildings from view.

10.7 PREDICTED EFFECTS OF THE PROPOSED DEVELOPMENT

10.7.1 Landscape Impacts

The significance of the predicted landscape effects is 'slight' neutral. The development would cause a shift in landscape character, from the current peri-urban condition towards employment-dominated urban, contributing to the realisation of the development strategy for the area.

10.7.2 Visual Impacts

The predicted visual effects on eight viewpoints representative of the receiving environment are summarised in Table 10.6 below.

Table 10.6: Summary of Viewpoint Assessments

	Location	Sensitivity	Magnitude of Change	Significance
Substation site				
01	Clogga Road adjacent to Kish Business Park	Low	Low	Not Significant neutral
02	Clogga Road to South of the Site	Low	Low	Not Significant neutral
03	Fields to north of site aligned with Kish Business Park access road	Medium	Low	Slight negative
04	Kish Business Park access road to South of Site	Medium	Low	Slight negative

Pylon site				
01	Ballyduff Road, near Senator Windows and Doors	Medium	Medium	Moderate negative
02	Farmstead west of the site on Ballyduff Road	Low	Medium	Slight negative
03	Knockenrahan, looking northeast	Low	Medium	Slight negative

The number and distribution of potential visual receptors in the receiving environment, and their degree of exposure to the site, is relatively limited. Nonetheless, there are a small number of residential properties in the area, and a tourism site (Moneylands Farm), which are exposed to the site and would unavoidably experience some reduction in visual amenity as a result of the development. In all cases, once the ALAP is fully implemented the development's effects would become neutral and negligible.

10.8 RESIDUAL EFFECTS

While no significant negative landscape or visual effects have been predicted, and in the long term the effects will become neutral, it was recommended that a Landscape Plan be prepared for the site.

Implementation of the Landscape Plan would – until further development takes place in the area - meaningfully reduce the negative visual effects on the small number of affected residential properties around the site. The planting would also have significant biodiversity benefits.

The landscape and visual effects of the Proposed Development on all landscape and visual receptors are predicted to be neutral or negative but not significant at commencement.

The buildings, associated engineering, roads, hardstanding and soft/hard landscape works have been designed to pre-emptively mitigate adverse effects on landscape character and sensitive visual receptors where possible, otherwise termed 'embedded mitigation', as assessed and identified above. Therefore, no mitigation measures other than those built into the proposal are proposed. In summary, key embedded mitigation measures include:

- To minimise visibility of the development with vegetative screening so that when the development is seen from any position, it would be glimpsed through vegetation rather than fully exposed to view.
- Generally introducing substantial planting of street trees of suitable species, visually softening, screening and providing a green landscape setting for the structures.
- Effective site planning to reinforce existing, and introduce new, axial lines of sight, anchoring the proposed development into the existing landscape structure, particularly in regard to Kush Business Park.
- The vegetation should screen the 2.1 metre perimeter fencing in addition to the buildings, wherever possible.
- Develop parts of the site as a wildflower meadow, so that in addition to its essential utility use the site also functions as an engine of biodiversity with a planting palette of native species to deliver a wide range of ecosystem services. Specifying wild

flower / meadow seed mix for the vacant parcels to improve biodiversity while the land awaits final development.

- The planned burial of the high voltage power transmission cables, to ensure that views within the vicinity of the proposed development are not compromised by their adverse, utilitarian appearance, while allowing planting of substantial tree species to screen intervisible views.

The proposed substation and underground line in terms of both landscape and visual effects, is neutral, slight and permanent, but it should be noted that the effects of the Proposed Development cannot be considered in all practicality without the cumulative effects of, in particular, the Permitted ICT Facility WCC Reg. Ref. 20/1088.

On balance, both landscape and visual effects are negative but not significant.

10.9 CUMULATIVE EFFECTS

The potential for cumulative impact (as far as practically possible) of the Proposed Development with any/all relevant planned, permitted or existing developments is as set out in Chapter 2, Section 2.8 and 2.9 of the EIAR, unless otherwise stated. The likelihood of cumulative effects in relation to the construction and operational phases are discussed in Sections 10.9.1 and 10.9.2 below.

10.9.1 Construction Phase

In relation to the potential cumulative effects within the landscape and visual environment during the construction phases, those key engineering works which could result in cumulative impact if not adequately mitigated include:

- The 110kV Substation, including the Control Centre and customer compound, access and earthworks;
- The associated construction works of the proposed underground line;
- The associated construction works of the proposed pylons;
- Permitted ICT Facility WCC Reg. Ref. 20/1088
- Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified the only simultaneous construction projects capable of combining with the Permitted Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed Development to combine with the construction phase of the Biofuel Facility proposed under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

Permitted ICT Facility WCC Reg. Ref. 20/1088; is subject to the Environmental Impact Assessment Report and planning conditions which include appropriate mitigation measures to minimise environmental impacts. Furthermore, Condition 8 of WCC Reg. Ref. 20/1088 requires the works contractor to provide a detailed Construction Environmental Management Plan (CEMP) for the Permitted ICT Facility. The CEMP

for the Permitted ICT Facility will ensure that this project will be managed in a safe and organised manner by the Contractor.

While there is the potential for cumulative impacts between the Proposed Development and the Permitted ICT Facility during a simultaneous construction phase, the effect is considered to be neutral, imperceptible, and temporary in duration (due to the duration of the construction works of the Proposed Development lasting no more than 12 months).

The proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181) is similarly subject to an Environmental Impact Assessment Report which includes appropriate mitigation measures to minimise environmental impacts. The proposed Biofuel Facility application included an outline Construction Management Plan (CMP). The CMP for the proposed Biofuel Facility will ensure that this project will be managed in a safe and organised manner by the Contractor.

While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during a simultaneous construction phase, the effect is considered to be neutral, imperceptible, and temporary in duration (due to the duration of the construction works of the Proposed Development and the proposed Biofuel Facility lasting no more than 12 months).

With the implementation of mitigation measures to protect soil and water quality in compliance with legislative standards the residual cumulative effect on land, soils, geology and hydrogeology of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be neutral, imperceptible, and long-term in duration (due to the duration of the construction works of the Proposed Development and the proposed Biofuel Facility lasting no more than 12 months).

The proposed cumulative effects during construction of the underground line in combination with the permitted ICT facility buildings development and Biofuel Facility, in terms of both landscape and visual effects, is neutral, slight and temporary.

The proposed pylons result in neutral, inconspicuous but permanent cumulative effects with any other new development within the study area.

10.9.2 Operational Phase

In relation to the potential cumulative impacts landscape and visual environment from the operational stages, the following could result in a cumulative impact if not adequately

- The Permitted ICT Facility WCC Reg. Ref. 20/1088
- Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).
- The access road and earthworks.
- The proposed pylons.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified the only simultaneous projects capable of combining with the Proposed Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed

Development to combine with the operational phase of the proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

The Permitted ICT Facility WCC Reg. Ref. 20/1088 is subject to the Environmental Impact Assessment Report and planning conditions which include appropriate mitigation measures to minimise environmental impacts during operation.

While there is the potential for cumulative impacts between the Proposed Development and the Permitted ICT Facility during operation, the effect is considered to be neutral, imperceptible, and long-term in duration.

The proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181) is similarly subject to an Environmental Impact Assessment Report which includes appropriate mitigation measures to minimise environmental impacts during operation.

While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during operation, the effect is considered to be neutral, imperceptible, and long term in duration.

The access road and earthworks remain as visible works and may increase the extent of the effect of hard standing and urbanisation of the character of the proposed 110kV Substation cumulatively with those of the Permitted ICT Facility. With the implementation of mitigation measures in the form of tree planting and earthworks to screen views of the Proposed Development from sensitive receptors, the residual cumulative effect on landscape character and views of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be neutral, imperceptible, and long-term in duration.

The proposed steel latticework pylons are larger and taller than the existing adjacent double timber power poles. The additional existing structures are of a similar nature, however. While there is the potential for cumulative impacts between the Proposed Development the existing power infrastructure during operation, the effect is considered to be negative, slight, and long-term in duration.

The proposed development is in keeping with the land use objectives for the site and the trend of landscape change in the receiving environment. It would cause no undue accumulation of landscape or visual effects, and once the ALAP is fully realised the development's effects would be reduced to neutral and negligible.

10.10 PROPOSED MONITORING

For the embedded mitigation to remain effective for the operational life of the scheme, it is recommended that the following monitoring measures are incorporated:

- Monitor all site vegetation for damage due to anti-social behaviour, and rapidly restore if required to ensure long-term effectiveness of mitigation measures.
- Monitor all site vegetation for adverse effects, particularly drought, water-logging, and exotic pests and diseases due to climate change (out with maintenance contract provisions) and rapid restoration if required to ensure long-term effectiveness of mitigation measures.

11.0 ARCHAEOLOGY, ARCHITECTURAL AND CULTURAL HERITAGE

11.1 INTRODUCTION

The following chapter assesses the predicted impacts of the proposed development on archaeological, architectural and cultural heritage. The proposed development is located along the M11 in the townland of Bogland, to the south of Arklow, County Wicklow. (ITM 723644, 670904), see Figure 11.1).

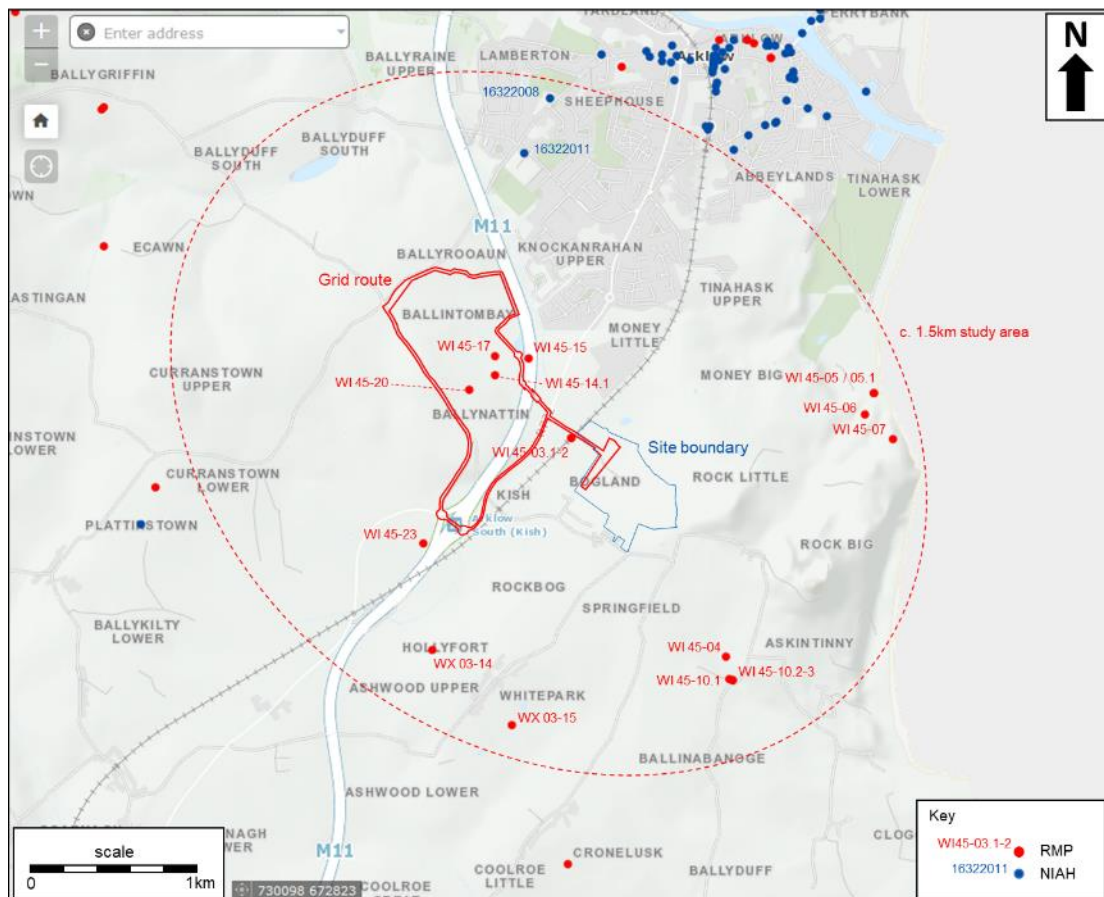


Figure 11.1 Site location map showing recorded archaeological monuments and architectural heritage sites within the vicinity of the Proposed Development (source: www.archaeology.ie).

11.2 METHODOLOGY

11.2.1 Introduction

To set the proposed development within its wider archaeological, architectural and cultural heritage landscape, and to assess the potential of encountering such features on the site, a paper survey of archaeological, architectural heritage, historical and cartographic sources was undertaken. The study area comprised a buffer of approximately 1.5km from the site, incorporating the following townlands: Ashwood Upper, Askintinny, Ballintombay, Ballynattin, Ballyrooan, Bogland, Cooladangan, Hollyfort, Kish, Knockanrahan Upper, Money Big, Money Little, Rock Big, Rock Little, Rockbog, Springfield, Tinahisk Upper and Whitepark.

11.2.2 Record of Monuments and Places

The Record of Monuments and Places (RMP), comprising the results of the Archaeological Survey of Ireland, is a statutory list of all recorded archaeological monuments known to the National Monuments Service. The RMP was established under the National Monuments (Amendment) Act, 1994. The relevant files for these sites contain details of documentary sources and aerial photographs, early maps, OS memoirs, the field notes of the Archaeological Survey of Ireland and other relevant publications. Sites included on the RMP all receive statutory protection under the National Monuments Acts 1930 - 2004. The information contained within the RMP is derived from the earlier non-statutory Sites and Monuments Record (SMR); some entries, however, were not transferred to the statutory record as they refer to features that on inspection by the Archaeological Survey were found not to merit inclusion in that record or could not be located with sufficient accuracy to be included. Such sites however remain part of the SMR. The record is a dynamic one and is updated so as to take account of on-going research. The RMP was consulted online through the Department website www.archaeology.ie. There are no recorded monuments within the proposed development lands; there are seventeen recorded archaeological monuments within the study area which comprises a distance of c. 1 km from the proposed development (see Figure 11.1, Table 11.1 and Appendix 11.1).

11.2.3 Recorded Archaeological Objects

The National Museum of Ireland's topographical files are a national archive of all known archaeological finds from Ireland. They relate primarily to artefacts but also include references to monuments and contain a unique archive of records of previous excavations. The topographical files were not accessible at the time of the study due to Covid-19 restrictions. Other published catalogues of prehistoric material were studied: Raftery (1983 - Iron Age antiquities), Eogan (1965; 1993; 1994 - bronze swords, Bronze Age hoards and goldwork), Harbison (1968; 1969a; 1969b - bronze axes, halberds and daggers). No artefacts were recorded from townlands within the study area; however, it is important to note that numerous artefacts would have been recovered from archaeological excavations in Ballynattin, and there are several recorded stone axes and bronze tools from Co. Wicklow.

11.2.4 Recorded Archaeological Excavations

The excavation bulletin website (www.excavations.ie) was consulted to identify previous excavations that have been carried out within the study area. This database contains summary accounts of excavations carried out in Ireland from 1970 to 2019. Eight archaeological excavations have been recorded from the study area (see Table 11.2 and Appendix 11.2).

11.2.5 Cartographic Sources

Cartographic sources were used to identify additional potential archaeological and cultural heritage constraints. The Down Survey 'Barony Map of Arklow in the County of Wicklow' is given as Figure 11.2. The Ordnance Survey first edition 6" (1837-1842) and second edition 25" (1888-1913) maps were also assessed (see Figures 11.3 - 11.5; www.archaeology.ie).

11.2.6 Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) is a systematic programme of identification, classification and evaluation of the architectural heritage of the State.

The Minister for Arts, Heritage and the Gaeltacht is currently using the Inventory as the basis for making recommendations for the NIAH. There are two structures included in the NIAH within the study area which comprises a distance of c. 1km from the proposed development (see Figure 11.1 and Appendix 11.3).

11.2.7 Historical Research

A review of online sources for the townlands of Bogland, Ballynattin, Ballintomba and Cooladangan and the inhabitants of the townland in the 19th and early 20th century was undertaken, using the following sources:

- Griffiths Valuation was the first full-scale valuation of property in Ireland, overseen by Richard Griffith and published between 1847 and 1864. It is one of the most important surviving 19th century genealogical sources (www.askaboutireland.ie/griffith-valuation/; see Figure 11.6)
- The National Archives comprises the files of the former State Paper Office (SPO) and the Public Record Office of Ireland (PROI). The SPO was established in 1702 as a repository for records relating to the administrations of the various Lords Lieutenant (the English monarch's representative in Ireland). The PROI was established under the Public Records (Ireland) Act, 1867 to acquire administrative, court and probate records over twenty years old (www.nationalarchives.ie/; see Appendix 11.4)

11.2.8 Aerial Photography

Modern Ordnance Survey aerial photographic coverage dating from 1999, 2000 and 2005 available on the Ordnance Survey of Ireland (www.osi.ie) and Google Maps (www.google.com/maps) were assessed (see Figures 11.7 – 8).

11.2.9 County Development Plan

The Wicklow County Development Plan 2021 – 2027 was consulted. The plan includes policy objectives for the protection of the County's archaeological, architectural and cultural heritage (see Appendix 11.5). The Record of Protected Structures (RPS) contained within each plan includes every structure which is of special architectural, archaeological, artistic, cultural, scientific, social or technical interest within the county boundaries. There are no structures included in the RPS within the site boundary or within the study area.

11.2.10 Field Survey

A walkover survey of the portion of the route that goes through the proposed development lands was undertaken on Friday 19th June 2020, in overcast, rainy weather. The lands were accessed from the southwestern boundary of the site and fields were numbered and walked in sequence, marked F1 – F2 on Figure 11.9. Photographs (Figures 11.10 – 11) and photograph directions are also marked on Figure 11.9 as P1 – P2.

11.2.11 Geophysical Survey

Geophysical survey was undertaken in in two phases in March and October 2020 by Target Archaeological Geophysics (Licence no. 20R0025) as part of the overall archaeological management plan for the site of the Permitted ICT Facility, that includes the site of the proposed 110 kV Substation. The survey objectives were to identify the location, form and extent of buried archaeological remains, where present within the

site boundary, and to advise further works prior to proposed development at the site (see Figure 11.12).

11.3 RECEIVING ENVIRONMENT

11.3.1 Introduction

The site of the proposed development is located in the townlands of Ballintombay, Ballinynattin, Bogland and Cooladangan which are in the Electoral Division of Arklow Rural, in Civil Parish of Arklow, in the Barony of Arklow, in the County of Wicklow.

Table 11.1: Recorded archaeological monuments within c. 1km of the proposed development (source: www.archaeology.ie).

RMP No.	Classification	Townland
WI045-003001-	Church	BOGLAND
WI045-003002-	Graveyard	BOGLAND
WI045-004----	Ritual site - holy well	ROCK BIG
WI045-005----	Church	ROCK BIG
WI045-005001-	Graveyard	ROCK BIG
WI045-006----	Ritual site - holy well	ROCK BIG
WI045-007----	Ritual site - holy well	ROCK BIG
WI045-010001-	Church	BALLINABANOGE
WI045-010002-	Graveyard	BALLINABANOGE
WI045-010003-	Children's burial ground	BALLINABANOGE
WI045-014001-	Enclosure	BALLYNATTIN
WI045-015----	Burnt mound	BALLYNATTIN
WI045-017----	Fulacht fia	BALLYNATTIN
WI045-020----	Excavation – misc.	BALLYNATTIN
WI045-023----	Excavation – misc.	COOLADANGAN
WX003-014----	Ringfort - unclassified	HOLLYFORT
WX003-015----	Fortification	WHITEPARK

11.3.2 Prehistory

Whilst there are no recorded archaeological sites directly on the route of the proposed development, substantial evidence of prehistoric (most probably from the Bronze Age (2500-500 BC)) settlement occurs in the immediate vicinity, uncovered during recent archaeological investigations associated with development works Ballinynattin, to the northwest of Bogland. These include a number of burnt mounds or fulachta fiadh (RMP Numbers: WI045-015---- and WI045-017----; see Table 11.1 and Appendix 11.1; see also Excavation numbers: 1997:609 and 2005:1696; see Table 11.2 and Appendix 11.2). Burnt mounds or fulacht fiadh comprise mounds of charcoal rich soil, heat-fractured stones accompanied by a trough sometimes lined with wooden planks, stone slabs or even clay (Waddell 1998). They are generally located close to water sources including streams, rivers, lakes or marshy ground. The exact use of these sites is still somewhat ambiguous with their traditional interpretation as cooking places coming into question in recent years. They date predominantly to the Bronze Age but date ranges

from the Mesolithic period to the medieval period have been returned. The prehistoric archaeological findings in Ballynattin are not confined to burnt mounds / fulachta fiadh; they include post-holes and linear enclosures which have been interpreted as evidence of settlement. The most significant of these was excavated by John Tierney of Eachtra, in which the remains of three potential Bronze Age structures were recorded. Approximately only one-third of each structure survived more recent disturbance and were excavated. Two comprised curvilinear slot-trenches, containing sherds of prehistoric pottery within their fills. There was little indication of associated posts to suggest that these were roofed structures. The third structure was circular in form and comprised nine postholes and 36 stake-holes. Three of the post-holes occurred within the structure and these are suggestive of internal supports for a possible roof. Two slot-trench-type cuts were excavated along the northern exterior of this structure. These cuts may represent a drainage feature or may further support the hypothesis that the structure was roofed for domestic use. A furnace was excavated to the east of the site. A saddle quern retrieved from within the fill of this feature would suggest that the furnace may have been used to dry corn or other tillage produce. Other features excavated included two hearths, with associated stake-holes, pits, groupings of post-holes and stake-holes, and spreads or dumps of material potentially associated with prehistoric activity (see Appendix 11.2: Excavation no. 2004:1841).

Table 11.2: Recorded archaeological excavations within c. 1.5 km of the proposed development (source: www.excavations.ie).

Excavation No	Licence No.	Site type	ITM
1997:609	97E128	Burnt mound	E 722494m, N 671276m
1998:686	98E257	Prehistoric enclosure	E 722494m, N 671276m
2003:2063	03E1692	Prehistoric	E 722494m, N 671276m
2004:1841	04E0712	Prehistoric	E 724086m, N 673442m
2004:1842	04E0937	No archaeological significance	E 724086m, N 673442m
2005:1694	04E0937 EXT.	Possibly prehistoric	E 723244m, N 671380m
2005:1695	04E0937 EXT.	Possible prehistoric activity	E 722494m, N 671276m
2005:1696	05E0741	Burnt mound and prehistoric settlement	E 722494m, N 671276m

11.3.3 The Medieval Period

Ringforts, such as that recorded in Hollyfort (RMP. No. WX003-014----), c. 2km to the southwest of the proposed development, are the characteristic settlement site of the early medieval period, generally consist of a circular area surrounded by a bank or fosse, or simply by a rampart of stone. The example at Hollyfort, located in an area of open pasture, is not visible at the surface but is marked as a circular enclosure (diam. c. 35m) and described as 'site of rath' on the 1839 ed. of the OS 6-inch map (see Appendix 12.1). Ringforts are usually interpreted as being defended farmsteads. Many ringforts have been partially or completely destroyed since the 1960s and often the only indication of the former presence of a ringfort is preserved in townland name elements such as Dún, Rath, Cashel or Lios. However, monuments which have experienced above-ground disturbance continue to be of archaeological interest due to the potential for subsurface remains to exist at their locations.

The Down Survey of Ireland, undertaken in the years 1656-1658, was the first ever detailed land survey on a national scale anywhere in the world. The survey sought to measure all the land to be forfeited by the Catholic Irish in order to facilitate its

redistribution to Merchant Adventurers and English soldiers. Profitable and unprofitable land were distinguished, and there were abbreviated captions for arable, meadow, bog, woodland, mountain and several kinds of pasture, with area figures for each of these categories. Coverage of other subjects was uneven. In the parish maps, dwelling houses with the owners' names are entered in each townland. As noted above, generally speaking, it was a survey of confiscated land. As a result of the redistribution, approximately 7,500 New Model Army veterans settled in Ireland, in what became known as the Cromwellian Plantation. Interestingly, the Barony of Arklow, within which is Bogland is located, was not included in the survey (see Figure 11.2), with the exception of Arklow town, including Arklow Castle, Abby and Abbyland.

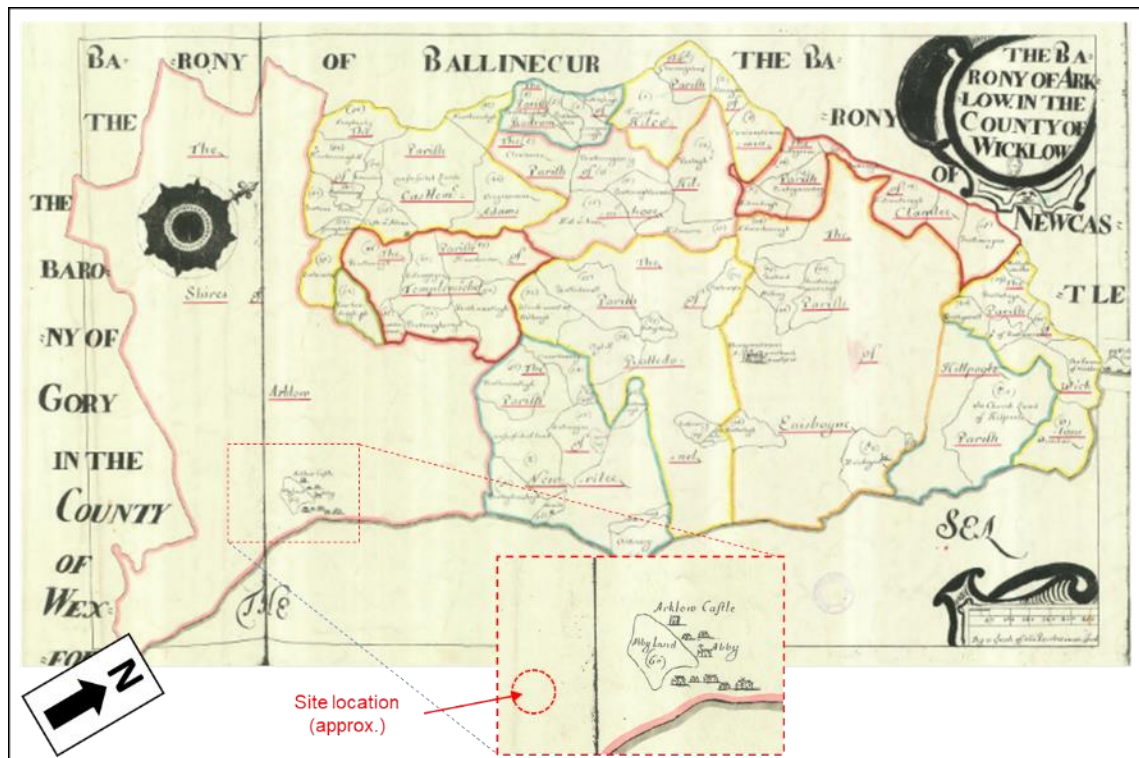


Figure 11.2: Extract from the Down Survey map (1656-1658) of the Barony of Arklow (source: www.downsurvey.tcd.ie/down-survey-maps.php#bm=Arklow&c=Wicklow).

11.3.4 The Post-Medieval & Modern Period

Lewis' topographical dictionary and accompanying map of Ireland is part of works on England, Ireland, Scotland and Wales, which together form Topographical Dictionaries, comprises historical and statistical descriptions of several counties, cities, boroughs, parish and villages within these countries. First published in 1837 in two volumes, with an accompanying atlas, it marked a new and significantly higher standard in such accounts of Ireland Lewis (1837). Along with visiting many of the sites in the book, the author sent proof sheets to knowledgeable locals in the area who would be able to add changes that had taken place in the meantime. Some of the entries are short, while others go deeper into history, geography, anecdotes, superstitions, and the life of the people in an area. The dictionary gives a unique picture of Ireland before the Famine.

Between 1829 and 1842 Ordnance Survey Ireland completed the first ever large-scale survey of an entire country. Acclaimed for their accuracy, these maps are regarded by cartographers as amongst the finest ever produced. In addition to showing the field boundaries of the mid-9th century, the first edition survey map highlights to features of

interest specific to the proposed development lands (see Figures 11.3-4). The site of Killynee chapel and graveyard is shown as a rectangular structure (aligned northwest to southeast) and corresponding rectangular boundary in dashed lines. These are shown as just outside the boundary of the proposed development (see Figure 11.4). This site is listed in the Record of Monuments of Places (see Appendix 11.1). Two other features are shown on the map to the southeast; an oval and a D-shaped shaded – they appear to be small ponds of water. The second of these is located at the northwestern boundary of the proposed development lands.

A series of buildings are also shown on the first edition map on the northeast boundary of the proposed development land (and within it), southeast of the proposed grid route. They comprise two buildings, one T-shaped and one elongated rectangle. These structures are connected to the main road to the northeast by a trackway which runs past the aforementioned Killynee chapel and graveyard site (see Figure 11.3).

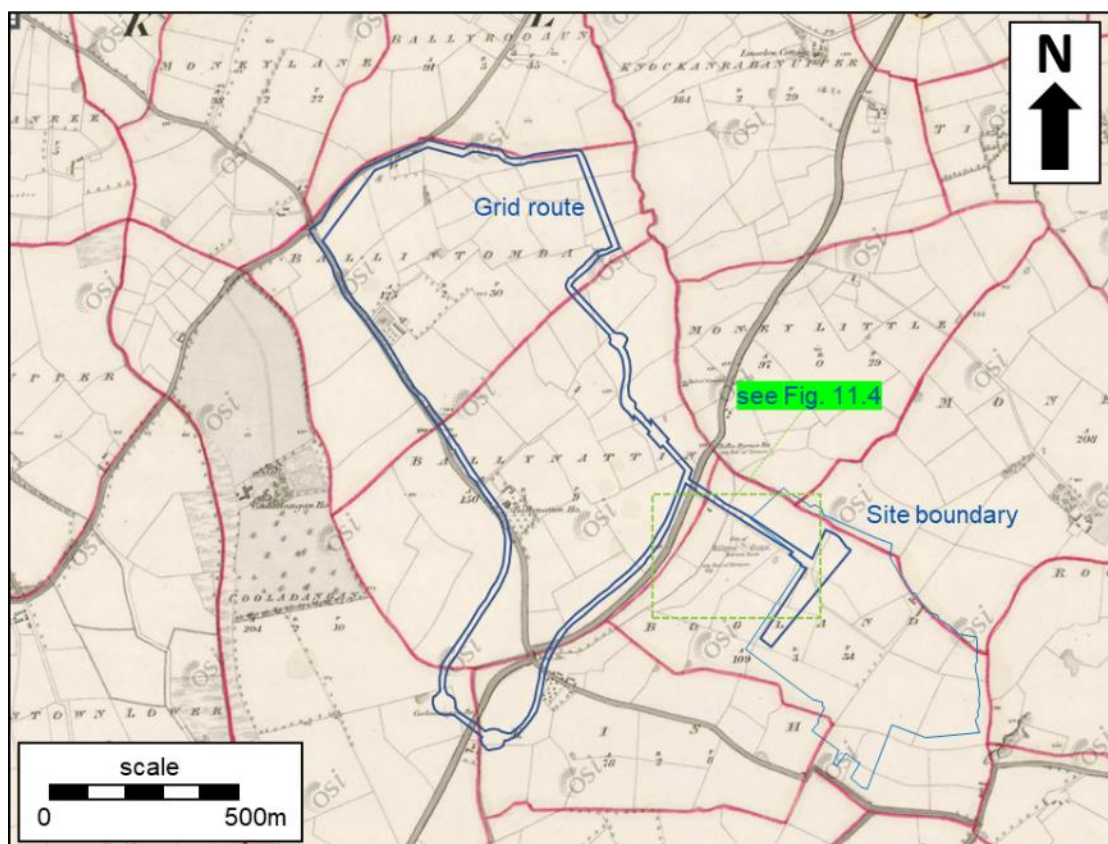


Figure 11.3: Extract from the 1st edition (c. 1838) survey map of Bogland (source: www.archaeology.ie).

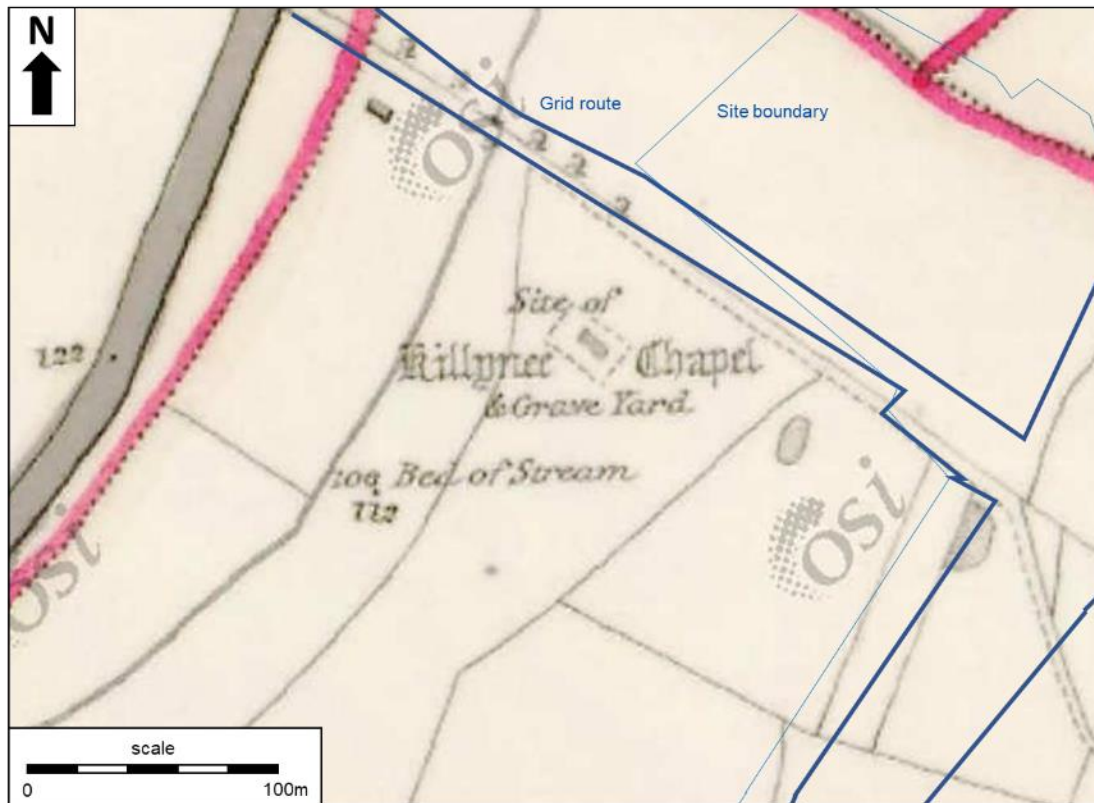


Figure 11.4: Extract from the 1st edition (c. 1838) survey map of Bogland; insert from Figure 11.3 (source: www.archaeology.ie).

The Dublin and South Eastern Railway was constructed in 1846, shortly after the first edition maps were published, and the impact on the landscape of this is evident on second edition Ordnance Survey dating to the early 1900s (see Figure 11.5).

The buildings shown on the first edition map to the northeast of the proposed development lands also do not appear on the second edition map; presumably they, plus the associated trackway have been removed in the intervening decades. The most notable addition to the landscape in between the first and second edition Ordnance Survey maps is the house and outbuildings and landscaped gardens in the middle portion of the proposed development lands, to the southeast of the proposed grid route (see Figure 11.4) and the associated entrance way leading to a level crossing across the railway line to the northwest. These buildings, surrounding gardens and driveway survive in a ruinous state to this day in this form (see below). In addition to these changes, the field layout changed between the time of the first and second edition maps, with the proposed development lands comprising four large fields as opposed to at least fourteen in the first half of the 19th century.

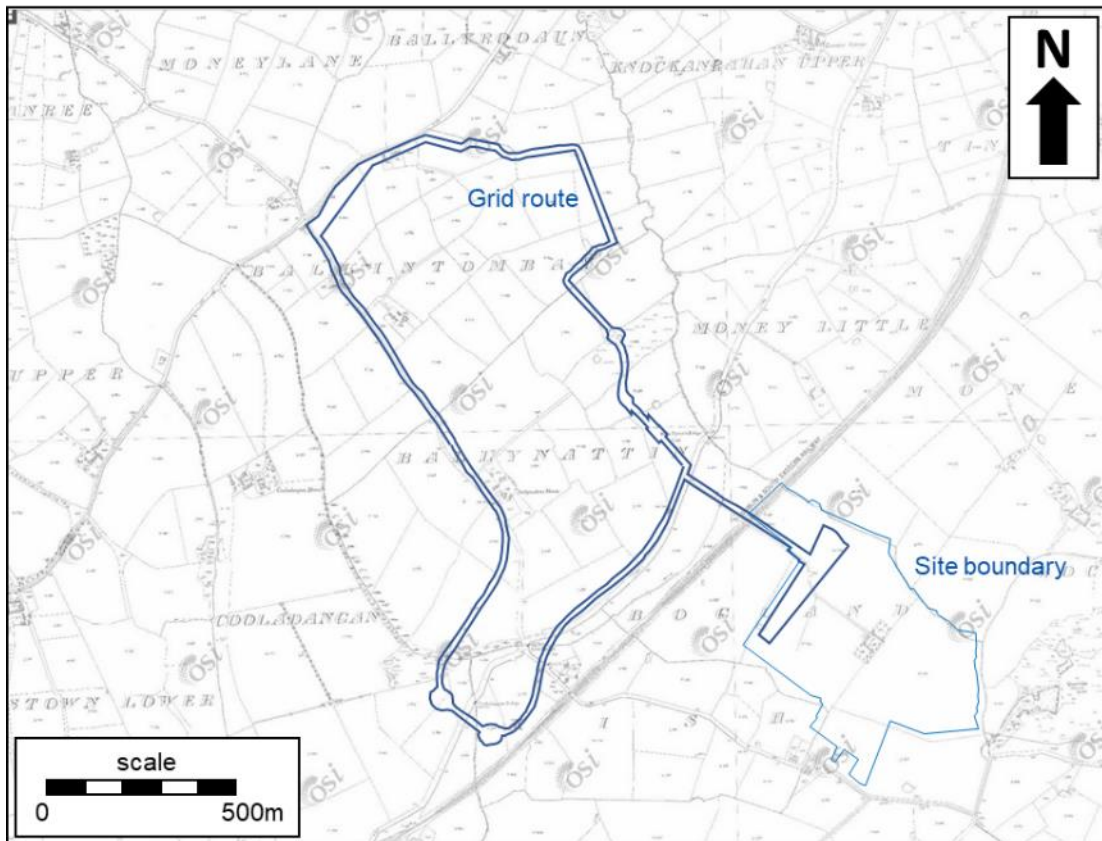


Figure 11.5: Extract from the 2nd edition (c. 1910) survey map of Bogland (source: www.archaeology.ie).

The Griffiths Valuation (1847-64) for the townland of Ballintomba, Ballynattin, Bogland and Cooladangan are shown in Figure 11.6. A summary of the valuations is presented in Table 11.3 below. The overwhelming majority of the valuation relates to land, with the exception of the value added by Cooladangan House and demesne, as visible on the first editions Ordnance Survey map (see Figure 11.3).

Table 11.3: Summary of Griffiths Valuation (1847-64) (source: www.askaboutireland.ie/griffith-valuation).

Townland	Land		Buildings		Total	
	£	s	£	s	£	s
Ballynattin	94	0	3	0	97	0
Bogland	138	0	7	10	145	10
Ballintombay	91	10	8	15	100	5
Cooladangan	208	17	19	0	227	17

VALUATION OF TENEMENTS.								79
PARISH OF ARLOW.								
No. and Letters of Reference to Map.	Names.		Description of Tenement.	Area.	Rateable Annual Valuation.		Total Annual Valuation of Rateable Property.	
	Townlands and Occupiers.	Immediate Lessors.			Land.	Buildings.		
		BOGLAND. (Ord. S. 45.)						
1	a	William Philpott.	Earl of Carysfort.	House, offices, and land.	100 3 34	94 0 0	2 0 0	96 0 0
-	b	Owen Kavanagh.	William Philpott.	House.	—	—	0 10 0	0 10 0
-	c	Bernard Connor.	Same.	House.	—	—	0 5 0	0 5 0
-	d	Hugh Bolger.	Same.	Office (<i>forge</i>).	—	—	0 5 0	0 5 0
				Total.	100 3 34	94 0 0	3 0 0	97 0 0
		BALLYNATTIN. (Ord. S. 45.)						
1	a	John Nuzum.	Earl of Carysfort.	House, offices, and land.	150 3 0	138 0 0	6 15 0	144 15 0
-	b	Terence Fitzpatrick.	John Nuzum.	House.	—	—	0 15 0	0 15 0
				Total.	150 3 0	138 0 0	7 10 0	145 10 0
		BALLINTOMBAY. (Ord. S. 45.)						
1		Sarah Byrne.	Earl of Carysfort.	House, offices, and land.	27 0 0	10 10 0	2 0 0	21 10 0
2		Sarah Duffy.	Same.	House, office, and land.	7 2 0	6 0 0	0 15 0	6 15 0
3		John Newsom.	Same.	House, offices, and land.	91 0 30	66 0 0	6 0 0	72 0 0
				Total.	125 2 30	91 10 0	8 15 0	100 5 0
		COOLADANGAN. (Ord. S. 45.)						
1	a	George McGrath.	Earl of Carysfort.	Land.	6 2 22	5 10 0	—	5 10 0
-		Henry Allen.	Same.	House and garden.	0 0 10	0 2 0	0 15 0	0 17 0
2		Thomas Harold.	Same.	House, offices, and land.	12 3 31	11 0 0	1 5 0	12 5 0
3		Thomas Murray.	Same.	House, offices, and land.	94 0 4	100 15 0	14 0 0	130 15 0
4		William Byrnes.	Same.	House, offices, and land.	28 3 2	31 10 0	1 0 0	32 10 0
5		James Bryan.	Same.	House, offices, and land.	62 0 18	54 0 0	2 0 0	56 0 0
				Total.	204 2 10	208 17 0	19 0 0	227 17 0

Figure 11.6: Extract from Griffith's Valuation of Ireland for Bogland townland (source: www.askaboutireland.ie/griffith-valuation/).

A review of the National Archives of Ireland suggests that the townlands of Ballintomba, Ballynattin, Bogland and Cooladangan were uninhabited at the time of the 1821, 1831, 1841 and 1851 census. The 1901 and 1911 census, broadly coinciding with the time of the second edition Ordnance Survey map and the buildings shown in Figure 11.5, are presented in Appendix 11.4). A summary of the population change over the intervening period is shown in Table 11.4. Relative to other parts of the country at this time, the population of these townlands is stable, with the same families occupying the area in broadly the same numbers.

Table 11.4: Summary of census results for 1901 and 1911 (source: www.nationalarchives.ie/).

Townland	1911	1901	Difference
Ballynattin	11	7	4
Bogland	9	5	4
Ballintombay	10	15	-5
Cooladangan	19	19	0
Total	49	46	3

A review of aerial photographs suggests that evidence of at least some of the former field boundaries survive as crop marks (see Figure 11.7). The majority of the proposed route traverses roads, but there are portions that will traverse greenfield – open pasture land (see Figure 11.8).

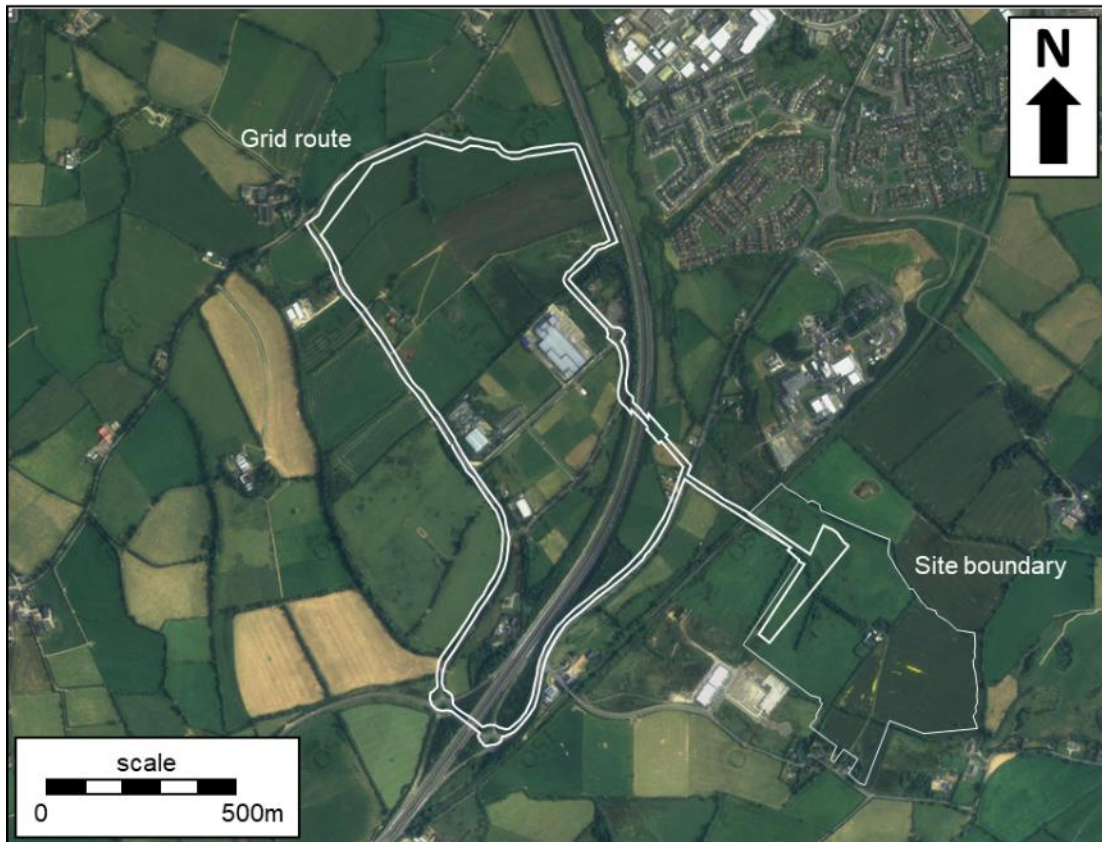


Figure 11.7: Aerial photograph of the proposed development site (source: www.archaeology.ie).

11.3.5 Field Survey

A walkover survey of the portion of the route that goes through the proposed development lands was undertaken on Friday 19th June 2020, in overcast, rainy weather. The lands were accessed from the southwestern boundary of the site and fields were numbered and walked in sequence, marked F1 – F2 on Figure 11.9. Photographs (Figures 11.10 – 11) and photograph directions are also marked on Figure 11.9 as P1 – P2.

Field 1

This is a very large hilly field in open pasture, being grazed by sheep at the time of the survey. The former gardens of the late 19th / early 20th century buildings (as depicted to the south of the proposed route on the second edition Ordnance Survey maps (Figure 11.5)) are clear in this field, comprised of mature hedgerow with a stone and earth bank and ditch. The ground conditions are very marshy in the north-western portion of the field, with reeds growing in places. No evidence of the former Killynee church and graveyard (RMP No. WI45-03.1-2; see Figure 11.1 and Appendix 11.1) was visible, either here, or when viewed from Field 2 (see Figure 11.10 (P1)).

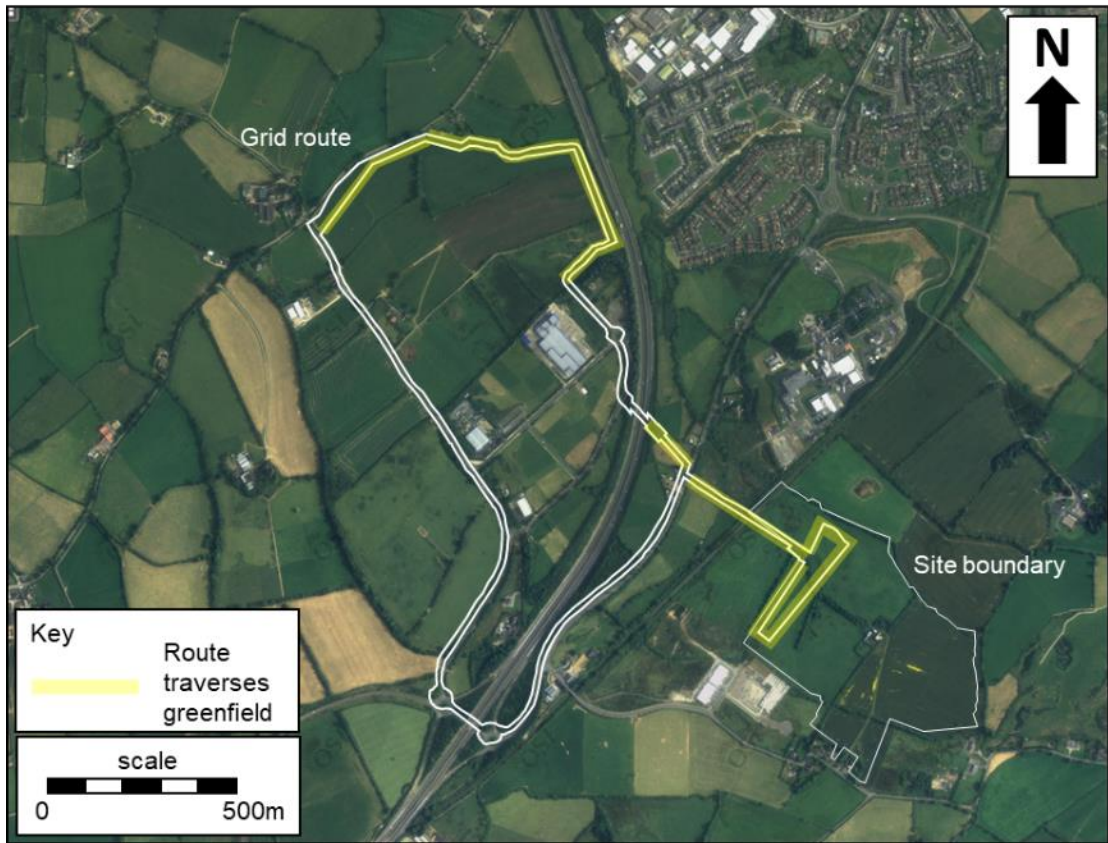


Figure 11.8: Aerial photograph of the proposed development site showing areas where the route traverses greenfield land (source: www.archaeology.ie).

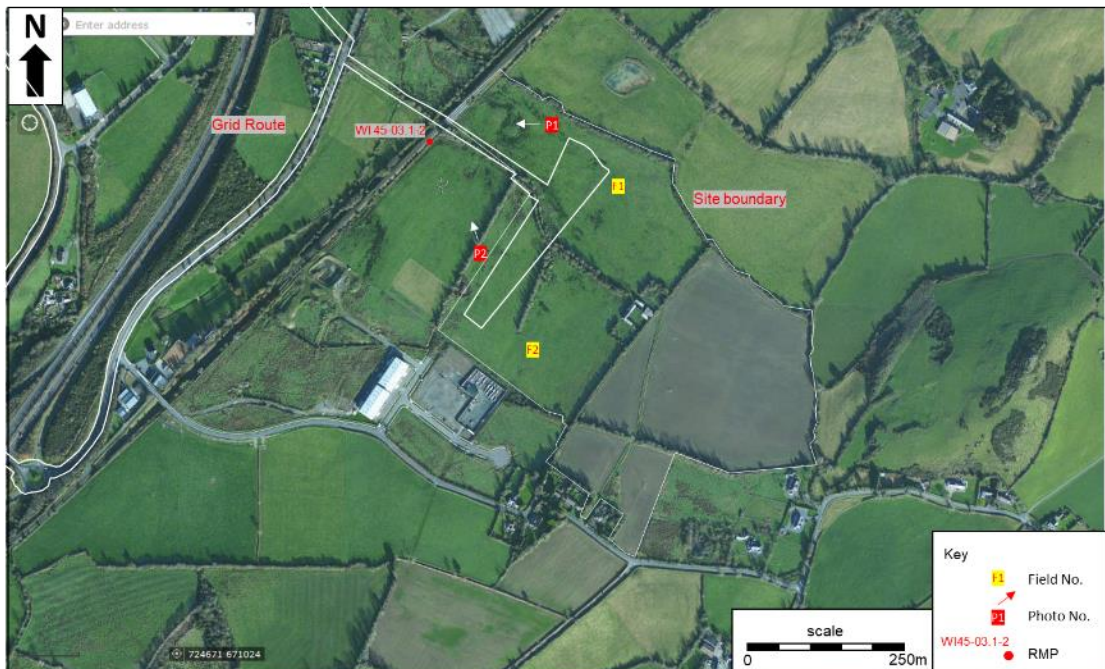


Figure 11.9: Field Survey Plan (source: www.archaeology.ie).



Figure 11.10: View of northwestern corner of Field 1, facing west (P1)



Figure 11.11: View towards the site of Killynee church and graveyard (RMP No. WI45-03.1-2) from Field 2, facing northwest (P2).

Field 2

This is a large field in open pasture. It has undulating topography but generally slopes to the northwest towards the railway embankment.

In the eastern corner of this field (and extending into the south-eastern corner of Field 6), survive the ruinous remains of the dwelling, farm buildings and gardens (see Figure 11.10 (P1)) as shown in the second edition Ordnance Survey map (see Figure 11.5). As noted above, the buildings themselves fall outside the route of the proposed grid route.

On the first edition Ordnance Survey map (see Figure 11.3) this field is divided into three fields, and the field boundary between two of these survives as a mature hedgerow running northeast to southwest across approximately two thirds of the field (see Figure 11.11 (P2)). The field is bounded to the southwest by a modern field fence to the Kish Business Park. The field is bounded to the northwest by mature hedgerow, although a modern post and rail fence runs parallel to this boundary approximately 20m to the southeast of this.

11.3.6 Geophysical Survey

Geophysical survey was undertaken in two phases in March and October 2020 by Target Archaeological Geophysics (Licence no. 20R0025; Nichols 2020) as part of the overall archaeological management plan for the proposed development site (to which the Grid route . The survey objectives were to identify the location, form and extent of buried archaeological remains, where present within the site boundary, and to advise further works prior to proposed development at the site (see Figure 11.12).

The survey employed an advanced multichannel fluxgate gradiometer system combined with cm precision GPS, recording magnetic gradiometer and GPS data simultaneously at rates of 75Hz and 1Hz respectively, conducting parallel instrument traverses 2.7m in width throughout M1-M2, with the instrumentation installed in tow configuration for use with an all-terrain vehicle.

Magnetic gradiometer survey in the north-western portion of the proposed development identified four potential fulachta fiadh sites to the northwest in field M1, and a probable enclosure ditch to the south-southeast of field M2. Further responses of possible significance were indicated by the results, including several potential pit locations to the south-southeast of field M1, and two groups of strongly magnetic response to the north-northeast of field M2. Interpretation of the latter remains uncertain. These strongly magnetic responses are similar in character to the potential fulachta fiadh sites recorded in field M1. However, given their proximity to the disused farm at the north-eastern edge of field M2, and the potential for landscaping/infilling in this location, a more recent landuse origin should also be considered for these anomalies.

Elsewhere, the results from this survey highlight patterns of past landuse in the form of disused field boundaries and former cultivation, as well as magnetic disturbance from overhead power lines and responses from natural soil/geological variation. The responses from natural soil/geological variation in the eastern portion of the site were of such magnitude that where subtle responses from buried archaeological features may be present in fields M3-M6, they are unlikely to be recorded due to the range of soil/geological variation encountered throughout.



Figure 11.12 Results of geophysical survey of site (source Target Archaeological Geophysics (Licence no. 20R0025).

No definitive archaeological patterns associated with church (WI045-003001) and graveyard (WI045-003002), located at the north-western edge of the proposed development, were identified in the survey.

11.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

A description of the project is included in Chapter 2 Description of the Proposed Development. The characteristics in relation to archaeology is primarily shallow ground disturbance during construction of the cable trenches in greenfield areas, and the foundation and land clearance works required for the 110 kV Substation. There will be no impact post construction.

11.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

11.5.1 Construction Phase

The archaeological, architectural and cultural heritage impact at the site can be summarised as follows:

The proposed underground route and 110kV substation will not impact on any recorded archaeological, architectural or cultural heritage sites. Geophysical survey did not identify any features potentially associated with the former chapel and graveyard site of Killynee, immediately to the northwest of the proposed 110kV substation.

Underground route

Although no features of archaeological or architectural heritage were identified along the proposed underground route, and the majority of the route has been extensively and significantly developed in the past, the route traverses a number of greenfield areas. In these areas, there is the potential for previously unrecorded archaeological features to survive.

110kV Substation

Geophysical survey identified a number of potential archaeological features, preliminarily identified as prehistoric fulachta fiadh, which are in keeping with similar findings uncovered during development in Ballynattin, to the northwest. One of these features is within the footprint of the proposed 110kV substation.

Potential impacts on archaeological and cultural heritage associated with the proposed development involves ground disturbance associated with the construction of the proposed development in greenfield areas. Should archaeological remains survive below surface, then ground disturbance in these areas would remove sub-surface features. It is anticipated that the land clearance works for the proposed 110 kV Substation site will proceed concurrently with the Permitted ICT Facility.

In the absence of mitigation measures the potential impact on as yet unknown sub-surface archaeological features is **negative, profound** and, **permanent**.

11.5.2 Operational Phase

There are no potential impacts on archaeological, architectural and cultural heritage expected as a result of the operational phase of the Proposed Development.

11.6 REMEDIAL AND MITIGATION MEASURES

11.6.1 Construction Phase

Underground route

As set out in Section 11.5 there is the potential for archaeological remains survive below surface. Ground disturbance in these areas would remove sub-surface features, should they exist. To mitigate against the potential impact of the proposed development on these features, should they exist, a programme of archaeological monitoring by a suitably qualified archaeologist under license to the National Monuments Service will be undertaken on the green field areas.

110kV Substation

As set out in Section 11.5 there is the potential for archaeological remains survive below surface, including potential features identified during geophysical survey. Ground disturbance in these areas would remove sub-surface features, should they exist. To mitigate against the potential impact of the proposed development on these features, should they exist, the following mitigation measures will be undertaken:

- Pre-development archaeological testing, under license to the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht, will be undertaken in advance of construction.

- Trenches will largely target anomalies identified by the archaeo-geophysical survey, but a number of trenches will also be excavated in areas where no features were highlighted (as per best practice guidelines; c. 10% of the site).
- Trenches will be dug by a tracked excavator equipped with a 1.8 m wide toothless ditching bucket. Each trench will be excavated to the surface of archaeological features, deposits or structures, or to the surface of the undisturbed natural soil or bedrock (typically less than 75cm). Topsoil will be removed from the test trenches in horizontal levels of not more than 0.20 m in thickness until sterile subsoil is reached.
- Should archaeological or architectural heritage features, deposits or structures be uncovered during these will be cleaned by hand, investigated and recorded.

11.6.2 Operational Phase

No mitigation measures are required for archaeological, architectural and cultural heritage during the operational phase of the proposed development.

11.7 RESIDUAL EFFECT OF THE PROPOSED DEVELOPMENT

11.7.1 Construction Phase

After the implementation of mitigation measures set out in Section 11.6 above, during the construction phase the academic knowledge gained from the excavation of these features, and / or the excavation of features found during monitoring, mean that the residual effect on as yet unknown sub-surface archaeological features ***imperceptible, positive, and long term.***

There will be no residual impacts of the proposed development on the archaeological, architectural and cultural heritage.

11.7.2 Operational Phase

There will be no residual impacts of the proposed development on the archaeological, architectural and cultural heritage.

11.8 CUMULATIVE IMPACT

The potential for cumulative impact (as far as practically possible) of the Proposed Development with any/all relevant planned, existing or permitted developments as set out in Chapter 2, Section 2.8 and 2.9 of the EIAR, unless otherwise stated. The likelihood of cumulative effects are discussed in Sections 11.8.1 and 11.8.2 below for construction and operational phases.

11.8.1 Construction Phase

In relation to the potential cumulative impact on archaeological, architectural and cultural heritage during the construction phases, there will be no impact on previously recorded archaeological remains however, there is a potential for previously unknown sub-surface archaeological features to be encountered during testing and / or monitoring.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified the only simultaneous construction projects capable of combining with the Permitted Development is the

Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed Development to combine with the construction phase of the Biofuel Facility proposed under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

Permitted ICT Facility WCC Reg. Ref. 20/1088; is subject to the Environmental Impact Assessment Report and planning conditions which include appropriate mitigation measures to minimise environmental impacts. Furthermore, Condition 25 of WCC Reg. Ref. 20/1088 requires the operator shall engage the services of a suitably qualified archaeologist (licensed under the National Monuments Acts 1930 - 1994) to monitor all topsoil stripping associated with the development.

While there is the potential for cumulative impacts between the Proposed Development and the Permitted ICT Facility during a simultaneous construction phase; the academic knowledge gained from the excavation of these features, and / or the excavation of features found during monitoring, mean that the cumulative effect on as yet unknown sub-surface archaeological features is considered to be ***imperceptible, positive, and permanent.***

The proposed Biofuel Facility under WCC Reg. Ref. 21.677 (subject to Appeal PL27.312181) is similarly subject to an Environmental Impact Assessment Report which includes appropriate mitigation measures to minimise environmental impacts. The proposed Biofuel Facility Environmental Impact Assessment Report included mitigation measures for a suitably qualified archaeologist to be appointed to oversee works, including pre-development testing under licence to the National Monuments Services.

While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during a simultaneous construction phase; the academic knowledge gained from the excavation of these features, and / or the excavation of features found during monitoring, mean that the cumulative effect on as yet unknown sub-surface archaeological features is considered to be ***imperceptible, positive, and permanent.***

With the implementation of mitigation measures the overall residual cumulative effect on archaeological, architectural and cultural heritage of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be ***imperceptible, positive, and permanent.***

11.8.2 Operational Phase

During operation there is no potential for cumulative impact as there will be no further disturbance to ground.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified any project that is capable of combining with the Permitted Development during the operational phase and result in cumulative effects. Cumulative effects can be conserved to be is considered to be neutral, imperceptible, and long-term in duration.

11.9 MONITORING OR REINSTATEMENT

Archaeological monitoring by a suitably qualified archaeologist of greenfield areas (other than those subjected to archaeological testing in advance) will be undertaken under license to the National Monuments Service during the construction phase. There are no requirements for ongoing monitoring or reinstatement requirements.

12.0 TRAFFIC AND TRANSPORTATION

12.1 INTRODUCTION

This Chapter of the EIA Report undertakes a Traffic and Transportation Assessment (TTA) of any likely or significant impacts associated with traffic and transportation issues arising from the Proposed Development. The report presents an assessment of both the operational and construction stages in terms of vehicular access.

12.2 METHODOLOGY

This chapter has been prepared taking the following documents into account:

- NRA's (now TII) Traffic and Transport Assessment Guidelines (PE-PDV-02045) (May 2014).
- Wicklow County Development Plan (WCDP) (2016 – 2022).
- TII document PE-PAG-02039 (Expansion Factors for Short Period Traffic Counts).
- Permitted ICT development Wicklow County Council (planning ref 20/1088)

The methodology used to conduct the assessment includes:

- Establishing baseline conditions – The existing conditions will be recorded including existing site location and use, surrounding road network, public transport services;
- Defining the development – This includes size, use, parking, staffing, trip distribution for the construction and operational stages of the development;
- Assess the potential impact of the development on the existing local transport network and its ability to carry the development traffic;
- Mitigation measures will then be proposed to offset any impacts that may result from the development.

12.3 RECEIVING ENVIRONMENT

12.3.1 Existing Road Access

Kish Business Park Road

Within the Kish Business Park, there are 2m wide pedestrian footpaths with a 2.5m wide grass verge. Street lighting is provided along the western side of the carriageway.

Clogga Road

Clogga Road is a single lane carriageway, which connects the R772 to rural Arklow and the Roadstone Arklow quarry. West of the Kish Business Park Road the road is c.6 metre wide. There is a 2m wide footpath provided from the R772 / Clogga Road priority junction to the Kish Business Park (approximately 450m) along the northern side of the carriageway only. Street lighting is also provided on this section. To the east the carriageway narrows to approximately five metres wide with narrow grassed verges.

R772

The R772 is a single lane carriageway regional road with no dedicated pedestrian or cyclist infrastructure provided. The road intersects the Clogga Road with a ghost island priority junction. Lighting is provided along the western side of the carriageway.

L6187

The L6187 is a single carriageway local road with no dedicated pedestrian or cyclist infrastructure. The road runs from the M11 Junction 21 roundabout to the L2190 Knockenrahan to the north.

Existing Site Access

The 110 kV Substation Site is currently accessed via the existing agricultural access from the Kish Business Park Road access. The off-road areas of Circuit Route A, Circuit Route B; can be accessed via existing agricultural or private road access points.

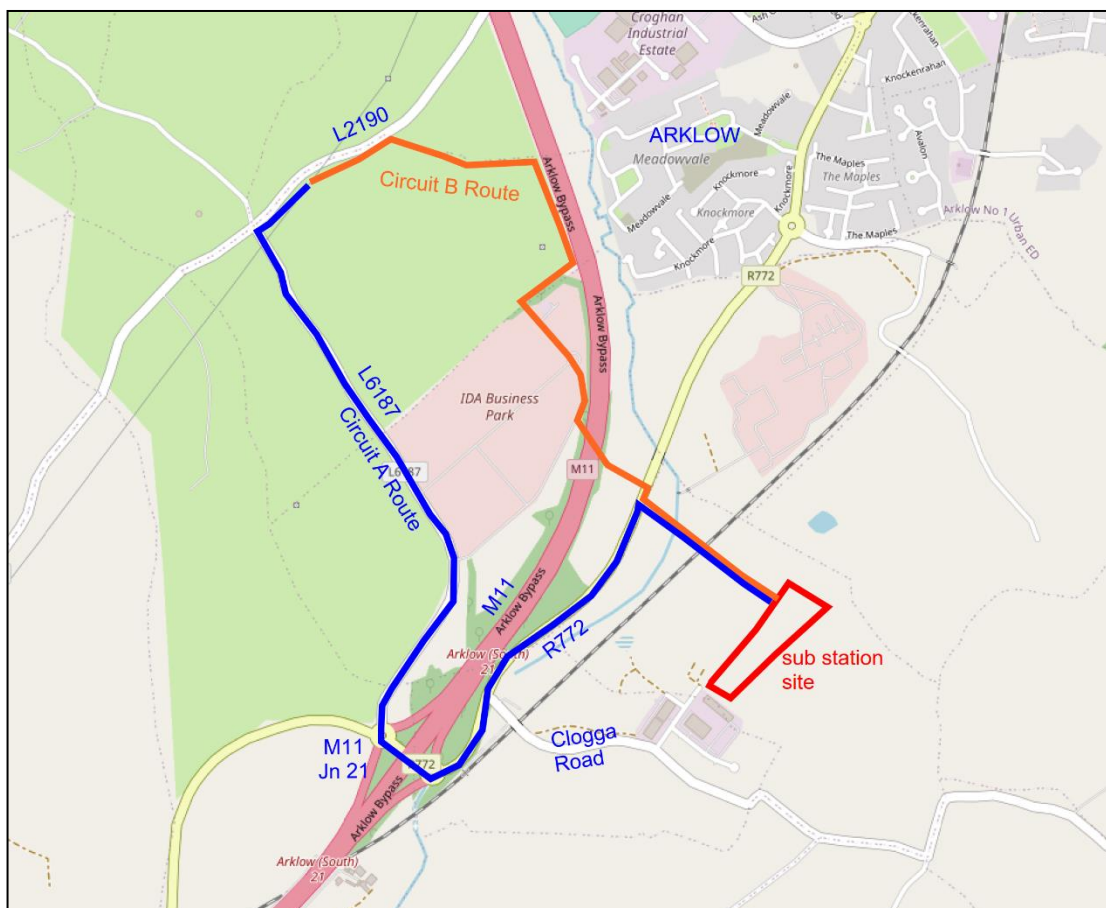


Figure 12.1 Location Plan © Openstreetmap Contributors

12.3.2 Existing Public Transport

The closest bus stops to the site are located along the R772 approximately 2.1 km north of the site. These bus stops are operated by Bus Éireann and private companies. These services travel towards Dublin and Wexford Town. Services operate at up to one hour intervals during the day.

The closest railway station to the site is Arklow Train Station, located 3.7km to the northeast of the development. It provides commuter rail services north to Dublin Connolly and south towards Rosslare Europort.

12.3.3 Road Safety

As part of the completion of this chapter, an assessment of collision statistics as published by the Road Safety Authority (RSA) is normally conducted. Historically collision statistics for 2005-2016 were reviewed as part of the assessment. At the time of preparation of this chapter the RSA was unable to share the information.

12.3.4 Existing Traffic Flow

In order to establish the existing local road network's traffic characteristics and subsequently enable the identification of the potential impact of the proposed development, traffic surveys (weekday classified junction turning counts) were conducted over a 12 hour survey period from 07:00 – 19:00 on Tuesday 4th February 2020 at the: R772 / Clogga Road junction.

Additionally, a classified ATC survey was carried out on the L6187 for the week 10/06/22-16/06/22. It was found that the highest daily flow occurred on Thursday 16th June 2022.

Traffic survey data is set out in Appendix 12.1.

12.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

12.4.1 Construction Phase

The development site for the 110 kV Gas Insulated Switchgear (GIS) Substation (intended to be called 'Oakdale Substation') comprises undulating farmland, whilst for the Circuit Route A, Circuit Route B and mast elements of the development will be carried out through private lands together with public road areas. The areas that the works will be carried out on are set out on Figure 13.1. Construction activities associated with the 110 kV Substation will be contained within the boundary of the site, whilst those associated with the Circuit Route A, Circuit Route B cable and duct laying will be linear in nature with sections of work opened up and reinstated on a daily basis. There will be a requirement for haulage of trench filling materials to the site, however quantities will not be significant. Construction materials will need to be brought to the site as will specialist plant. It is anticipated that these deliveries will occur throughout the day.

Construction accesses to work zones will be via the local road network and existing field accesses as necessary.

Onsite parking area will be provided for construction vehicles at the construction compound for the Permitted ICT Facility which will be accessed from the section of inner relief road delivered as part of the Permitted ICT development.

Timelines for the sections of work and maximum number of worker related traffic movements are as below from commencing in 2023.

Table 12.1 Construction Traffic Volumes

Work Package	Duration	Maximum daily LV's	Maximum daily HGV's
Substation and associated works	12 months	20	10
Ducting, cabling and mast works	8 months	25	10

Duct and Cable Routes

There will be two cable routes established between the 110 kV Substation site and the existing Arklow – Banoge overhead line to provide a loop-in loop-out connection. The construction of duct runs incorporates horizontal directional drilling for some sections in order to negate adverse impact on the railway and M11 motorway. Where possible routings are via farmlands, but there will be part routing along the local road network.

Circuit A

The underground cable (Cable Circuit A) is a single circuit 110 kV cable and communications ducts and 5 joint bays that will follow a liner route of 2,888 m; originating at the proposed 110 kV Substation and terminating at the existing 110 kV Arklow – Banoge overhead line. The 2,888 m route can be summarised as approximately:

- extending to the north-west c. 434 m from the proposed 110 kV Substation including a 103 m horizontal directional drilling (HDD) crossing under the Dublin-Rosslare rail line via.
- c. 800 m in the existing carriageway ducting along the R772 to the M11 Junction 21
- c. 300 m in carriageway through the M11 Junction 21
- Proceeding to the northwest c. 1,400 m in the existing carriageway along the L6187.
- At the terminus the cable connects to the existing 110 kV Arklow – Banoge overhead line via a proposed c. 17 m above ground level lattice mast adjacent to Knockeneahan Road (L2190).

Circuit B

The underground cable (Cable Circuit B) is a single circuit 110 kV cable and communications ducts and 4 joint bays that will follow a liner route of 2,164 m; originating at the proposed 110 kV Substation and terminating at the existing 110 kV Arklow – Banoge overhead line. The 2,164 m route can be summarised as approximately:

- extending to the north-west c. 416 m from the proposed 110 kV Substation including a 103 m horizontal directional drilling (HDD) crossing under the Dublin-Rosslare rail line via.
- 158 m in farmland crossing, and carriageway ducting along the R772
- 142 m under the M11 via HDD
- 600 m in private road (IDA), and future development lands (IDA)
- 900 m in farmland
- At the terminus the cable connects to the existing 110 kV Arklow – Banoge overhead line via a proposed c. 17 m above ground level lattice mast adjacent to Knockeneahan Road (L2190).

12.4.2 Operational Phase

The 110 kV Substation, customer compound, control building site is located within the Permitted ICT Facility site adjacent to the Kish Business Park. Individual accesses will be constructed from the from the permitted spine road; one to the 110 kV Substation, and a second on off the ICT internal site road to the customer compound and control building. The accesses are a minimum of 4.5m wide to facilitate one-way flow.

The internal layout of the site has been designed to give clear, legible routes for pedestrians and motorists to enter and exit the development.

The proposed development does not require any full time staff to operate it on a daily basis. It is forecast that there will be five van movements per week to the site for site maintenance purposes, together with some additional infrequent site visits for infrastructure maintenance. The number of visits conservatively equates to 1 vans per day – or 2 trips.

The cable routes and grid connections will require intermittent inspection and maintenance.

Car Parking

The site has access hard stand areas surrounding the substation and customer compound equipment and building and 9 no car parking spaces are provided. As access is only for maintenance, vans will park on the hardstand areas adjacent to areas of work.

Cycle Parking

No cycle parking spaces are proposed as part of the Proposed Development as all maintenance personnel servicing it shall access the site via light vehicles.

12.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

12.5.1 Construction Phase

The delivery to site of materials will be spread throughout the day. Site operatives would arrive and leave the site over approximately two hour periods during the morning and evening. All vehicles will have sufficient space within the site to manoeuvre and turn around.

Parking for construction operatives will be within the 110 kV Substation site operatives working on the duct and cabling works would travel to the work site from the site compounds.

The impacts of site operative and construction vehicles on the surrounding road network will be reduced by the offset nature of trips from that of the receiving road network. Due to the spread out nature of trips it is more appropriate to compare the traffic against the daily traffic using the road.

To assess the development traffic impact on the surrounding road network the current AADT (Annual Average Daily Traffic) flows were calculated based on traffic survey information (weekday classified junction turning counts) that were conducted over a 4th February 2020 12hr survey period from 07:00 – 19:00 for the R772/Clogga Road. This

provides a flow on each link. Assessing these links will address the generated traffic impact on the local road network.

To assess the development traffic impact on R772 and Clogga Road the current AADT has been calculated utilising the traffic counts survey data and TII's document PE-PAG-02039 (Expansion Factors for Short Period Traffic Counts).

The current two-way vehicle flow on R772 and Clogga Road are 7,649 and 1,116 vehicles during traffic counts survey time (7:00 – 19:00) respectively.

According to expansion factors (EF) listed in PE-PAG-02039, the AADT is calculated as: **1.17** (12 hour total (WADT EF)) x **0.97** (Day EF) x **1.03** (Month EF) = **1.17**

R772 7,649 x 1.17 = 8,940 AADT vehicles

Clogga Road 1,117 x 1.17 = 1,305 AADT vehicles

These figures were then grown from the 2020 base year to an assumed 2023 year for works. Using Central Growth rates as per TII document Transport Infrastructure Ireland (TII) 'Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (PE-PAG-02017 - May 2019) Table 6.2:

2020- 2023 (1.0157)³ **1.048**

The June 2022 survey for the L6187 was carried out over a week, so therefore average 2,215 WADT flow is converted to AADT using a **0.96** (Month EF)

L6187 – 2,216 x 0.96 = 2,126 AADT vehicles

This figure was then grown from the 2022 base year to an assumed 2023 year for works. Using

2020- 2023 (1.0157)¹ **1.0157**

The current usage on the various links is as calculated below, which can be considered to be the Do-Nothing scenario. There will be additional trips on the various links due to the construction works. The additional construction trips are summarised in Table 12.2 below.

Table 12.2 *Additional Traffic on Affected Links*

	2023 AADT	Construction Traffic Trips	% Increase
Clogga Road	1,367	110	8.0
R772	9,370	130	1.4
L6187	2,160	20	1.0

The higher proportional additional trips on Clogga Road are due to the existing flows being relatively low, whilst the additional flows on the other two links the R772 and L6187 are insignificant compared to existing flows.

As the works associated with the ducting and cabling works will require trenching and reinstatement in the R772 and L6187 public roads there will be a need to carry out the works under traffic management via shuttle working. This will impact traffic locally to

the works. These works will be carried out over only part of the eight month time frame required for this part of the works.

12.5.2 Operational Phase

The resultant number of peak hour trips due to the development are set out in the table below.

Table 12.3 Percentage Impact on the adjacent road network during the Opening Year 2023

	2023 AADT	Operational Traffic Trips	% Increase
Clogga Road	1,367	2	0.1
R772	9,370	2	0.0
L6187	2,160	0	0.0

The Table 12.3 above indicates that there would be a negligible increase in traffic associated with the operational phase of the development.

12.6 REMEDIAL AND MITIGATION MEASURES

12.6.1 Construction Phase

AWN Consulting and the project team have prepared *Outline Construction Environmental Management Plan (CEMP)* (2022) that is included with the application documentation. The plan includes measures to minimise the impacts associated with the construction phase upon the peak periods on the surrounding road network. Overall measures will include:

- use of site wheel cleaning facilities,
- regular cleaning of the main access road;
- surface of the car park will be prepared and finished to a standard sufficient to avoid mud spillage onto adjoining roads;
- monitoring and control of construction traffic during construction works.
- Construction Traffic Management Plan to minimise movements during peak hours.
- Material deliveries and collections from site will be planned, scheduled and staggered to avoid unnecessary build-up of construction works related traffic.
- All works carried out within public roadways will be carried out under Traffic Signs Manual Chapter 8 requirements.
- Carrying out ducting works in discrete sections allowing for short sections of opened up work and requirement to reinstate surfaces as works progress.

To minimise construction impacts upon the surrounding road network, it will be required that all construction traffic accesses and exits the site via the N11 Junction 21 with no HGV construction traffic permitted to travel through Arklow town.

HGV trips are anticipated to arrive and depart the site at a uniform rate throughout the day, to avoid pressure on the morning and evening peak hour periods.

All contractors vehicles will park within the 110 kV Substation development site area. The contractor will be required to designate an area within the confines of the site dedicated to operative car parking. There will be no parking permitted on the surrounding road network or estate roads by the contractor or site operatives.

12.6.2 Operational Phase

The subject site will be accessible to staff from the Kish Business Park internal road and spine road.

Due to the negligible increase in traffic associated with the operational phase of the development as shown in Table 12.3 above, there are no further mitigation measures required.

12.7 RESIDUAL EFFECTS OF THE DEVELOPMENT

12.7.1 Construction Phase

Construction works for the substation will include site levelling works at the site, and these will largely be contained within the site. There will be materials required for the building works, and deliveries will spread throughout the working day. Construction operatives will travel to and from the site, but the anticipated timings of trips will largely be offset from the peak times on the local road network. Works for the ducting and cabling element will be carried out in a linear manner on the local links which will result in localised delays due to traffic management. Based on the assessment of the network links there will be insignificant effects on the receiving traffic and transportation environments. The residual effect of construction works will be **temporary, insignificant and negative**.

12.7.2 Operational Phase

The proposed development will have an insignificant effect on the road network, in particular the road links in the proximity of the development. Overall, the residual effect of the development will be **long term** in duration of **insignificant, neutral** effect.

12.8 CUMULATIVE IMPACTS OF THE DEVELOPMENT

The potential for cumulative impact (as far as practically possible) of the Proposed Development with any/all relevant planned, existing or permitted developments as set out in Chapter 2, Section 2.8 and 2.9 of the EIAR, unless otherwise stated. The likelihood of cumulative effects are discussed in Sections 12.8.1 and 12.8.2 below for construction and operational phases.

12.8.1 Construction Phase

Cumulative impacts refer to a series of individual impacts that may, in combination, produce a significant impact. The underlying rationale of this cumulative or 'in-combination' assessment is to take account of cumulative impacts from existing or proposed plans and projects, and these will often only occur over time.

In relation to the potential cumulative impact on the traffic and transportation during the construction phases, those key works which could result in cumulative impact if not adequately mitigated arise from additional trips due to the works associated with the

development. The required shuttle working associated with works within carriageways will result in some localised delays at the works.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified the only simultaneous construction project capable of combining with the Proposed Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. However, there is the potential for the Proposed Development to combine with the construction phase of the Biofuel Facility proposed under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181) should that be approved.

It is anticipated that some site clearance works associated with the Permitted ICT development (ref 20/1088) will be carried out concurrently with the development works. Those site clearance works would generate less than the peak construction traffic volumes accounted for in the previous assessment. These, combined with the proposed development would not be greater than the peak construction traffic for the ICT Facility.

Permitted ICT Facility WCC Reg. Ref. 20/1088; is subject to the Environmental Impact Assessment Report and planning conditions which include appropriate mitigation measures to minimise environmental impacts.

The Environmental Impact Assessment Report (Chapter 13, Traffic and Transportation) for the Permitted ICT Facility found that there would be significant spare capacity at junctions in the vicinity of the site.

Furthermore, Condition 8 of WCC Reg. Ref. 20/1088 requires the works contractor to provide a detailed Construction Environmental Management Plan (CEMP) for the Permitted ICT Facility. The CEMP for the Permitted ICT Facility will ensure that this project will be managed in a safe and organised manner by the Contractor.

While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during a simultaneous construction phase; the effect is considered to be **neutral, imperceptible**, and **temporary** in duration (due to the duration of the construction works of the Proposed Development and the proposed Biofuel Facility lasting no more than 12 months).

Contractors for the proposed development will be contractually required to operate in compliance with a Construction Environmental Management Plan CEMP which will include the mitigation measures outlined in this EIA report. As a result, there will be a minimal impact on the receiving environment.

With the implementation of mitigation measures set out in Section 12.6 the residual cumulative effect on traffic and transportation during the construction phase of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be **neutral, imperceptible**, and **temporary** in duration (due to the duration of the construction works of the Proposed Development lasting no more than 12 months).

12.8.2 Operational Phase

In relation to the potential cumulative impacts on traffic and transportation from the operational stages, the proposed development will necessitate additional movements of vehicles on the local road network. A review of the existing projects in the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has

identified the only simultaneous projects capable of combining with the Permitted Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed Development to combine with the operational phase of the proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181) should that be approved.

The Proposed Development includes measures integrated with the adjacent Permitted ICT Facility development which provides onsite cycle and pedestrian facilities to align the works with improvements for such facilities in the broader transportation environment.

The development will have a cumulative impact on the broader transportation environment. Even accounting for background traffic growth, the development will not have a significant impact capacity of the local network.

Permitted ICT Facility WCC Reg. Ref. 20/1088; is subject to the Environmental Impact Assessment Report and planning conditions which include appropriate mitigation measures to minimise environmental impacts.

The Environmental Impact Assessment Report (Chapter 13, Traffic and Transportation) for the Permitted ICT Facility found that there would be significant spare capacity at junctions in the vicinity of the site during the operational phase.

The proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181) is similarly; subject to an Environmental Impact Assessment Report which includes appropriate mitigation measures to minimise environmental impacts during operation.

The potential combining of the operational traffic associated with the developments together would only result in a small increase on the surrounding network.

With the implementation of mitigation measures set out in the EIAR for the permitted ICT facility the residual cumulative effect on traffic and transportation during the operational phase of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be **neutral, imperceptible**, and **long term** in duration.

13.0 MATERIAL ASSETS - UTILITIES

13.1 INTRODUCTION

This chapter prepared evaluates the potential impacts, from the Proposed Development on Material Assets as defined in the EPA Guidelines '*Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2022), Advice Notes *Draft Advice Notes for Preparing Environmental Impact Statements* (EPA, 2015), and *European Commission Guidance on Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report* (2017)

13.2 METHODOLOGY

The Directive 2011/92/EU defined Material Assets as '*resources that are valued and that are intrinsic to specific places; they may be of either human or natural origin*' this included architectural and archaeological heritage. The Directive 2014/52/EU included architectural and archaeological heritage as components of cultural heritage; this EIA report has also done so within in Chapter 11 Archaeological, Architectural and Cultural Heritage.

The EPA Guidelines (2022) state that material assets are taken to mean "*built services and infrastructure, roads and traffic and waste management*". The EPA Advice Notes (2015) also gives examples of material assets including; assimilative capacity of air and water; ownership and access; and tourism and recreational infrastructure. The European Commission Guidance (2017) refers to a number of examples of material assets including buildings, other structures, mineral resources and water resources.

In this EIA Report, the impacts on some of the material assets described in the above guidance have already been considered in the following chapters and therefore these aspects will not be addressed in specific detail within this chapter.

- Chapter 4, Population and Human Health;
- Chapter 5, Land, Soils, Geology & Hydrogeology;
- Chapter 6, Hydrology;
- Chapter 8, Air Quality & Climate;
- Chapter 11, Cultural Heritage
- Chapter 12, Traffic & Transportation; and
- Chapter 14, Waste Management.

This chapter assesses ownership and access, built services and infrastructure, which have not already been addressed elsewhere in this EIA Report. The subsequent sections address built services and infrastructure. The potential impacts on built services and infrastructure, if any, are assessed in under the following subheadings:

- Land Use, Property, and Access
- Power and Electrical Supply;
- Surface water infrastructure;
- Foul drainage infrastructure;
- Water supply; and
- Telecommunications.

The associated built services and infrastructure in the vicinity of the site are summarised in the following sections; further detail is provided within the planning application documentation.

13.3 RECEIVING ENVIRONMENT AND CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

13.3.1 Land Use, Property, and Access

The application procedure in respect of strategic infrastructure development pursuant to *Section 182A* is provided for under Article 214 of the Planning and Development Regulations, 2001, as amended (“*the 2001 Regulations*”). There is no equivalent provision to Article 22(2)(g) of the 2001 Regulations, which imposes a requirement to enclose, with a planning application under section 34 of the 2000 Act, the written consent of any landowner whose land is included in the planning application, where the said land is not owned by the applicant himself. This was confirmed by the High Court in *n North East Pylon Pressure Campaign Limited .v. An Bord Pleanala and Others*.¹

There is no prescribed application form in respect of strategic infrastructure development, whether under *Section 182A*, or otherwise. An application form is made available by the Board for strategic infrastructural development, which refers to landowner consent. However, it is clear that this could not and does not impose any legal requirement to submit the written consent of any third party landowner whose land is included within the application site as there is no regulatory requirement in that regard. This is addressed at paragraph 21 of the judgment in *North East Pylon* as follows:

“21. As to An Bord Pleanála’s ‘Application Form for Permission/Approval in respect of a Strategic Infrastructure Development’ there is: (i) no such form prescribed by law; (ii) for the reasons stated previously above, no requirement that a person making application under s.182A of the Act of 2000 obtain landowner consent; and (iii) no way that the said form could change this legal position – in and of itself the form is something of a legal nothing. Be that as it may, the applicants have pointed to Box 7 of the said form as support of their argument as to the need for landowner consent.”²

The Proposed Development site is c. 8.68 ha of predominantly agricultural land located in the townlands of Kish, Bogland, Ballynattin and Ballintombay, to the south of Arklow, Co. Wicklow. The 110 kV Substation Site is located within the Kish Business Park and comprises part of an irregularly shaped field bounded by hedgerows typical of its agricultural setting and is currently in use as agricultural land. “Circuit Route A” and “Circuit Route B” are linear routes of 2934 m and 2216 m respectively, connecting the 110 kV Substation Site to the existing 110 kV overhead line located to the west. These routes are generally surrounded by the IDA Business Park, agricultural lands and some once-off developments.

The 110 kV Substation Site lands are zoned *E Special – Special Employment* under the *Arklow and Environs Local Area Plan 2018-2024*. E Special zoning is to facilitate opportunities for large, single, undivided employment development, with a given

¹ [2017] IEHC 338.

² Emphasis added.

example being significant IT developments. The surrounding E Special zoned lands are currently still in use as agricultural lands. The Cable Routes predominantly run along existing roads and through an area to the north with no zoning designation. Sections of the routes traverse areas zoned *E1 – Employment* and a small area of *OS2 – Open Space 2* in order to reach the 110 kV Substation Site. The Cable Routes also run alongside areas zoned *RE – Existing Residential*. The context of the site is described further in Chapter 2 (Description of Development).

There is an existing two-way road from the Kish Business Park to the proposed site boundary (although no formal access); this road includes a 2 m wide pedestrian footpath and 2.5 m grass verge on both sides. The Cable Circuits and Drop Down Mast are predominantly located on public lands or accessed via existing agricultural entrances on the local road network.

During construction a temporary access will be established for the 110 kV Substation Site from the Kish Business Park road terminus at the western site of the site. It is proposed that the accesses and haul roads for vehicles, the contractors' compound and fencing will be utilised for all development on the main site. It is proposed that during operation the 110 kV Substation Site will be accessed via a permitted inner relief road under WCC Reg. Ref. 201088, from the Kish Business Park road terminus at the western site of the site. This road will be adjacent to Armstrong Engineering and accessed via Clogga Road. The access points are discussed further in Chapter 12 (Traffic and Transportation).

13.3.2 Power and Electrical Supply

Currently there is no significant electrical supply on site. The proposed Cable Circuits and Drop Down Mast will provide a loop in / loop out to the existing 110 kV Arklow – Banoge overhead line to the northwest of the Substation site.

During construction, contractors will require temporary power for onsite accommodation, and construction equipment and plant. The power requirements will be relatively minor. During construction it is anticipated that generators will be provided on site to provide temporary power until a temporary connection to mains can be established.

When operational the 110 kV Substation, Cable Circuits and Drop Down Mast do not require an electrical supply.

The proposed 110 kV Substation and the cable connections are designed to support power demand for the three ICT Facilities previously permitted under WCC Reg. Ref. 201088. The Proposed Development will ultimately be owned and operated by ESB Networks.

13.3.3 Surface Water Infrastructure

The Substation site is currently agricultural land, and stormwater currently is drained by a series of agricultural ditches which connect to the Moneylane Stream which ultimately discharges into the Avoca River. There is no existing public surface water infrastructure available on the 110 kV Substation site. Along the routes of Cable Circuits A and B there are existing surface water control / networks traversing the L6187, R772 and M11 roads, the Irish Rail railway line and through the Kish Business Park.

The proposed construction works (inclusive of the Permitted ICT Facility) include the removal, infilling and redirection of the existing agricultural ditches that currently drain the site. Surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction. Any discharge water will be treated using a silt-buster or similar to removed suspended solids prior to discharge.

The excavated trench for the underground line will be dewatered if required, from a sump installed within the low section of the opened trench. Where dewatering is required, dirty water will be fully and appropriately attenuated, through silt bags, before being appropriately discharged to vegetation or surface water drainage feature.

There is no additional hardstanding or surface water generation associated with the operational phase of the Cable Circuits or Drop Down Masts.

The new hardstanding and resultant surface water associated with the 110 kV Substation will be managed via the Permitted ICT Facility (WCC Reg. Ref. 201088) surface water drainage system.

This Permitted ICT Facility surface water drainage system has been designed in relation to Sustainable Urban Drainage Systems (SuDS) in accordance with the guidelines of the GSDSDS, the SuDS Manual Ciria C753, and the 2016-2022 Wicklow Green Infrastructure Development Plan Strategy. The proposed measures incorporated in the design include:

- Swales and filter along road verges;
- Permeable paving in each parking space;
- Petrol and debris interceptor; and
- Attenuation and detention basins .

The Permitted ICT Facility development includes a detention basin to attenuate the surface water at the lower portion of the site, along the western boundary. The capacity of the detention basin is 7820 m³, the volume was designed for the 1 in 100-year storm event, allowing for 20% climate change. The detention basin will discharge with a 50:50 split into 2 no. existing culverts under the Dublin-Rosslare railway. These culverts direct the attenuated water into the Moneylane Stream.

Prior to discharging, the surface water runoff will be reduced to the existing greenfield runoff via 2 no. hydro-brake flow control which will limit the flow to 101.921 l/s each (203.84 l/s total). The average greenfield runoff rate – Qbar – was calculated using a soil type 4 with a soil value of 0.47 and a standard annual average rainfall of 1128mm.

Runoff from the roofs and all hardstand areas of the proposed Substation development will be collected using road gullies and a suitably sized network and discharged into the Permitted ICT Facility storm sewer. Prior to discharging into this storm sewer in the access road, all run-off will pass through a petrol interceptor. There is no requirement for additional attenuation measures as the attenuation basin granted for the Permitted ICT Facility has been designed to accommodate all proposed run-off for the entire development.

The Proposed Development will have no connection to local surface water drainage infrastructure.

Further reference is made to surface water drainage and flood risk in Chapter 6 (Hydrology).

13.3.4 Foul Drainage Infrastructure

There is no existing public foul network at the 110 kV Substation site, properties in the adjacent development to the Substation Site within Kish Business Park treat their wastewater on site.

Along the routes of Cable Circuits A and B there is existing sewer / foul network traversing along the existing local road L6187, along the existing M11, along the existing Regional Road R772, along the Irish Rail railway line and through the existing Kish Business Park.

Welfare facilities will be provided for the contractors via portable sanitary facilities within the construction compound site during the construction works. It is anticipated that due to the short duration of works and low waste water requirements that foul water will be collected from the welfare facilities by a licensed waste sewerage contractor.

The Cable Circuits and Drop Down Masts will have no waste water demand when operational.

There will be limited waste water demand associated with the welfare facilities within the 110 kV Substation building when operational. The substation building is an unmanned facility with visiting maintenance crews. This is generally a two man crew visiting site for a routine weekly inspection and a more comprehensive inspection once per year. Discharged foul water from the proposed substation will be collected using a suitably sized network and discharged into a new junior pumping station located in the green area adjacent to the substation. From here sewage will be pumped via a rising main to a new discharge manhole before gravity flowing into the Permitted ICT Facility network previously approved under WCC Reg. Ref. 20/088.

The previously Permitted ICT Facility at the site (WCC Reg. Ref. 201088) will collect sanitary effluent for on-site treatment by means of 1 no. BMS BL4000 Blivet treatment plant with treated effluent being pumped via a rising main along the link road and discharge into a receiving discharge manhole located beside the existing Kish Business Park pumping station. Treated effluent then gravity flows into the existing pumping station in Kish Business Park. From that point effluent is pumped southwest along the railway line, under the railway line and then northeast to a gravity network which terminates at the Croghan Industrial Estate Pumping Station.

A Pre-Connection Enquiry form has been issued to Irish Water in relation to the feasibility of servicing the Permitted ICT Facility with a foul water connection (CDS21001316). Irish Water issued a Confirmation of Feasibility letter on 4 January 2022 (see Appendix 13.1) to confirm that the proposed foul water connection to the Arklow WWTP / Irish Water network can be facilitated subject to onsite treatment and upgrade works.

The Permitted ICT Facility includes for on-site treatment of foul water before being pumped via a rising main along the link road and discharge into a receiving discharge manhole located beside the existing Kish Business Park pumping station. Treated effluent then gravity flows into the existing pumping station in Kish Business Park. From that point effluent is pumped southwest along the railway line, under the railway line and then northeast to a gravity network which terminates at the Croghan Industrial

Estate Pumping Station. The Proposed Development will have no connection to local foul drainage infrastructure. Further reference is made to foul water in Chapter 6 (Hydrology).

13.3.5 Potable Water Supply

The 110 kV Substation Site has no direct connection to existing potable water supplies. Along the route of Cable Circuits A and B there is an existing watermain network traversing along the existing Regional Road R772, M11, through the existing Arklow Business Park and Kish Business Park.

During construction, a temporary connection will be required for welfare facilities, dust suppression and general construction activities. It is anticipated that due to the short duration of works and low water requirements that water supply will be provided by tanker to the site.

When operational the Cable Circuits and Drop Down Masts do not require a potable water supply.

The 110 kV Substation building has a potable water requirement associated with welfare facilities (canteen and single toilet facility). A 32 mm connection will be made to the permitted ICT Facility (WCC Reg. Ref. 201088) 150 mm watermain.

A Pre-Connection Enquiry form has been issued to Irish Water in relation to the feasibility of servicing the Permitted ICT Facility with a water supply connection (CDS21001316). Irish Water issued a Confirmation of Feasibility letter on 4 January 2022 (see Appendix 13.1) to confirm that the proposed water supply connection to the Irish Water network can be facilitated subject to upgrades. The upgrades outlined by Irish Water are for the upsizing of approx. 50 m of existing watermain to 150 mm, and the construction of approx. 50 m of new 150 mm watermain, on site storage will also be required for this development. An agreement will be reached with Irish Water to progress with the connection, and the Applicant will fund a portion of the extension works.

Further reference is made to water supply in Chapter 6 (Hydrology).

13.3.6 Telecommunications

Telecommunications including fibre required during the construction phase will be provided via a mobile connection.

There are telecommunication lines in existence for telephone and broadband services in the area and fibre provisions for the Proposed Development.

13.4 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

13.4.1 Land Use, Property, and Access

During the construction phase there are potential short-term nuisances such as dust, noise, as well as the potential for pollution of groundwater or the existing drainage ditches associated with demolition, excavations and construction.

AWN Consulting and the project team have prepared *Outline Construction Environmental Management Plan (CEMP)* (2022) that is included with the application documentation. The CEMP will be implemented and adhered to by the construction

Contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. All personnel working on the Site will be trained in the implementation of the procedures.

The potential impact associated with land use and property for the construction phase will be **negative, not significant**, and **short term**, with a localised extent.

During the operational phase the Proposed Development is not anticipated to generate significant air (including odour), noise or water emissions during normal operating conditions; these have been discussed further in the respective EIAR chapters, Chapter 6 (Hydrology), Chapter 8 (Air Quality & Climate) and Chapter 9 (Noise and Vibration) Chapters.

The majority of the land is zoned '*E Special – Special Employment*', the Proposed Development represents a loss of agricultural land however in the overall context of Ireland's available agricultural land the loss is negligible.

Due to the zoning of these lands, the overall potential impact associated with land use and property for the operational phase will be a **neutral, not significant**, and **long term**, with a localised extent.

13.4.2 Power and Electrical Supply

The power requirements for the construction phase will be relatively minor. The potential impact associated with power and electrical supply for the construction phase will be a **neutral, imperceptible** and **short term**.

In this instance the nature of the Proposed Development ensures that rather than utilising electricity, the Proposed Development will connect existing infrastructure to the permitted ICT Facility development. The Substation, Cable Circuits and Drop Down Masts themselves do not have any operational electricity requirements.

There are no potential impacts associated with power and electricity supply for the Proposed Development for the operational phase.

13.4.3 Surface Water Infrastructure

There is no connection to any public surface water infrastructure proposed during the construction or operational phase, there are therefore no potential impacts on the existing surface water infrastructure.

During the construction phase, there is potential for an increase in run-off due to the introduction of impermeable surfaces and the compaction of soils. This will reduce the infiltration capacity and increase the rate and volume of direct surface run-off. The potential impact of this is a possible increase in surface water run-off and sediment loading which could potentially impact local drainage. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses. This is addressed in Chapter 6 (Hydrology).

The operational phase of the development represents an increase in hardstanding area that, if not properly mitigated, has the potential to cause an increase in surface water run-off and flooding offsite and downstream of the development site. In addition silty water or water contaminated with hydrocarbons can arise from hardstand areas and carparks.

The design of the site has included measures to attenuate surface water to acceptable flows and treat stormwater prior to discharge following GDSDS guidelines; thus the design has appropriately mitigated potential risks associated with flooding taking into account climate change risk. This is addressed in Chapter 6 (Hydrology).

The potential impact associated with surface water for the operational phase is ***neutral, imperceptible, and long term.***

13.4.4 Foul Drainage Infrastructure

Welfare facilities will be provided for the construction workers on site during the construction works and wastewater will be of domestic origin only, this will be tankered off site by an apparently licenced contractor.

The potential impact on foul drainage for the construction phase is ***neutral, imperceptible, and short term.***

During the operational phase the wastewater from the site will be treated in an on-site package wastewater treatment system and percolation system to ground. Irish Water have confirmed through the PCE that there is available capacity within the network for the Proposed Development (see Appendix 13.1). Irish Water is the National Authority for water management and should there have been an inadequate supply this would have been confirmed to the developer during consultation. An agreement will be reached with Irish Water to progress with the connection, and the Applicant will fund a portion of the extension works required.

There is no connection to any public foul water infrastructure and therefore no potential impacts on these material assets.

13.4.5 Water Infrastructure

During the construction phase the water requirements for the site will be minimal and facilitated through road tanker delivery. This will serve the construction compound, welfare facilities and any other construction activities for the duration of construction works on the Proposed Development. The demand during the construction phase is not expected to be significant enough to have any potential impact on the existing water supply network.

The potential impact on potable water infrastructure for the construction phase is ***neutral, imperceptible, and short term.***

Irish water have confirmed through the PCE that there is available supply within the network for the Proposed Development (see Appendix 13.1). Irish Water is the National Authority for water management and should there have been an inadequate supply this would have been confirmed to the developer during consultation. An agreement will be reached with Irish Water to progress with the connection, and the Applicant will fund a portion of the extension works required.

The potential impact on potable water infrastructure for the operational phase is ***neutral, imperceptible, and long term.***

13.4.6 Telecommunications

There are no potential impacts associated with telecommunications for the Proposed Development for the construction phase.

It is assumed that there is sufficient capacity available in the network to accommodate the development, so there are no potential impacts associated with telecommunications for the Proposed Development for the operation phase.

13.5 REMEDIAL AND MITIGATION MEASURES

13.5.1 Construction Phase

Ongoing consultation with the Irish Water, EirGrid, ESB Networks, and other relevant service providers within the locality and compliance with any requirements or guidelines they may have will ensure a smooth construction schedule without disruption to local and business community. The works contractor will be obliged to put best practice measures in place to ensure that there are no interruptions to these utilities, unless this has been agreed in advance.

Coordination and consultation should be had between the project team and ESB and Irish Water and other relevant service providers within the locality as the design progresses. This is to ensure a smooth construction schedule without disruption to the local and business community. It is not anticipated that connections to these would have any significant offsite impact.

AWN Consulting and the project team have prepared *Outline Construction Environmental Management Plan (CEMP) (2022)* that is included with the application documentation. The CEMP will be implemented and adhered to by the construction Contractor and will be overseen and updated as required if site conditions change by the Project Manager, Environmental Manager and Ecological Clerk of Works where relevant. All personnel working on the Site will be trained in the implementation of the procedures.

The construction Contractor will provide a further detailed CEMP that will include any subsequent planning conditions relevant to the Proposed Development and set out further detail of the overarching vision of how the construction Contractor of the Proposed Development manage the Site in a safe and organised manner.

The construction contract will detail the site specific surface water protection measures including silt control features and measure for the management of spills.

In order to mitigate any impact on surface water runoff, the new drainage network for the 110 kV Substation site will be constructed on a phased basis and consideration will be given to the construction of temporary pipes and detention ponds, if required.

During construction any liquid materials, paints, fuels etc. should be stored within temporary bunded areas, doubled skinned tanks or bunded containers.

13.5.2 Operational Phase

It is expected that consultation with the Irish Water, EirGrid, ESB Networks, and other relevant service providers within the locality and compliance with any requirements or guidelines they may have will ensure that there will be no ongoing impacts on material assets.

The stormwater system has been designed to collect rainwater runoff from the impermeable areas of the site, roofs and road/car park and directed to an appropriate SuDS and attenuation system. The discharge from site will pass through hydrocarbon

interceptors to remove any hydrocarbons and screen rubbish, debris and sediment from the surface water.

No further remedial or mitigation measures are required in relation the operational phase.

13.6 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

13.6.1 Construction Phase

The works contractor will be obliged to put best practice measures to ensure that there are no interruptions to service from the existing telecommunications network, watermain, sewer and electrical grid. Any planned interruptions will be agreed in advance with the utilities suppliers. Strict quality control measures will be undertaken while laying pipes to minimise or eradicate infiltration and ex-filtration. The predicted impact will be **neutral, imperceptible, and short term** for the construction phase.

The implementation of mitigation measures within each chapter, and detailed in Section 13.5.1 will ensure that the predicted impacts on the material assets will be **neutral, imperceptible, and short-term** for the construction phase.

13.6.2 Operational Phase

As the 110 kV Substation, Cable Circuits and Drip Down Masts do not require an operational electricity supply there are no predicted impacts associated with power and electricity supply. There are no predicted impacts associated with telecommunications for the Proposed Development for the operational phase.

The operator has engaged with Irish Water to ensure that there is sufficient capacity in the public watermain to cater for the Proposed Development. Irish Water have confirmed that there is adequate capacity (see Appendix 13.1). It is not anticipated that connections to these would have any significant offsite impact. The predicted impact will be **neutral, imperceptible, and long-term** for the operational phase.

The implementation of mitigation measures within each chapter, and detailed in Section 14.5.2 will ensure that the predicted impacts on the material assets during the operational phase will be **neutral, imperceptible and short-term**.

13.7 MONITORING AND/OR REINSTATEMENT

Monitoring arrangements will be reached with utility suppliers. No additional monitoring or reinstatement is required.

13.8 CUMULATIVE IMPACT ASSESSMENT

The potential for cumulative impact (as far as practically possible) of the Proposed Development with any/all relevant planned, existing or permitted developments as set out in Chapter 2, Section 2.8 and 2.9 of the EIAR, unless otherwise stated. The likelihood of cumulative effects are discussed in Sections 13.8.1 and 13.8.2 below for construction and operational phases.

13.8.1 Construction Phase

In relation to the potential cumulative impact Material Assets - Utilities during the construction phase, Proposed Development may result in an additional impact on the demand of the existing utilities in the surrounding area.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified the only simultaneous construction projects capable of combining with the Permitted Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed Development to combine with the construction phase of the Biofuel Facility proposed under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

Permitted ICT Facility WCC Reg. Ref. 20/1088; is subject to the Environmental Impact Assessment Report and planning conditions which include appropriate mitigation measures to minimise environmental impacts. Furthermore, Condition 8 of WCC Reg. Ref. 20/1088 requires the works contractor to provide a detailed Construction Environmental Management Plan (CEMP) for the Permitted ICT Facility. The CEMP for the Permitted ICT Facility will ensure that this project will be managed in a safe and organised manner by the Contractor.

While there is the potential for cumulative impacts between the Proposed Development and the Permitted ICT Facility during a simultaneous construction phase; the effect is considered to be **neutral, imperceptible**, and **temporary** in duration (due to the duration of the construction works of the Proposed Development lasting no more than 12 months).

The proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181 is similarly; subject to an Environmental Impact Assessment Report which includes appropriate mitigation measures to minimise environmental impacts. The proposed Biofuel Facility application included an outline Construction Management Plan (CMP). The CMP for the proposed Biofuel Facility will ensure that this project will be managed in a safe and organised manner by the Contractor.

While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during a simultaneous construction phase; the effect is considered to be **neutral, imperceptible**, and **temporary** in duration (due to the duration of the construction works of the Proposed Development and the proposed Biofuel Facility lasting no more than 12 months).

With the implementation of mitigation measures to protect soil and water quality in compliance with legislative standards the residual cumulative effect on Material Assets - Utilities of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be **neutral, imperceptible**, and **temporary** in duration (due to the duration of the construction works of the Proposed Development and the proposed Biofuel Facility lasting no more than 12 months).

13.8.2 Operational Phase

In relation to the potential cumulative impacts on the Material Assets - Utilities from the operational stages, the operation of the Proposed Development will result in an additional impact on the demand of the existing utilities in the surrounding area.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified the only simultaneous

projects capable of combining with the Permitted Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed Development to combine with the operational phase of the proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

However, additional demands on these services from the Proposed Development are not excessive. The on-site substation will be connected to the Permitted ICT Facility WCC Reg. Ref. 20/1088; site utilities. Irish Water is the National Authority for water management and should there have been an inadequate supply this would have been confirmed to the developer during consultation.

While there is the potential for cumulative impacts between the Proposed Development and the Permitted ICT Facility during operation; the effect is considered to be **neutral**, **imperceptible**, and **long-term** in duration.

The Proposed Developments such as the Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181) and any other permitted developments in the surrounding area will, have engaged with Irish Water to ensure that there is sufficient capacity to cater for each development. This means that the cumulative impact for the Proposed Development has already been taken into account when the project team consulted with the relevant service providers.

While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during operation; the effect is considered to be **neutral**, **imperceptible**, and **temporary** in duration.

With the implementation of mitigation measures to protect soil and water quality in compliance with legislative standards the residual cumulative effect on Material Assets - Utilities of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be **neutral**, **imperceptible**, and **long-term** in duration.

14.0 MATERIAL ASSETS - WASTE MANAGEMENT

14.1 INTRODUCTION

This chapter evaluates the impacts, if any, which the proposed development may have on Waste Management as defined in Directive 2014/52/EU, the EPA EIA Report Guidelines 2022 and EPA Draft Advice Notes for EIS 2015.

This chapter has also been prepared to address the issues associated with Waste Management during the construction phase of the proposed development as described in Chapter 2 (Description of the Proposed Development).

A site-specific Resource Waste Management Plan (RWMP) has been prepared by AWN Consulting Ltd to deal with waste generation during the excavation and construction phases of the proposed development and has been included as Appendix 14.1. The RWMP was prepared in accordance with the Environmental Protection Agency's (EPA) document 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021) and 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' document produced by the National Construction and Demolition Waste Council (NCDWC) in conjunction with the Department of the Environment, Heritage and Local Government (DoEHLG) (2006).

The Chapter has been prepared in accordance with European Commissions Guidelines, Guidance on the preparation of the Environmental Impact Assessment Report (2017), the EPA Guidelines on the Information to be contained in EIAR (2022) and the EU Commission Notice on changes and extensions to projects, 2021.

These documents will ensure the management of wastes arising at the development site in accordance with legislative requirements and best practice standards.

14.1.1 Methodology

The assessment of the impacts of the proposed development, arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management; including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

This Chapter is based on the proposed development, as described in Chapter 2 (Description of the Proposed Development) and considers the following aspects:

- Legislative context;
- Construction phase (including site preparation, excavation and construction);
- Operational phase

A desktop study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;

- Description of the typical waste materials that will be generated during the Construction and Operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction phase of the proposed development have been calculated and are included in Section 14.3 of this chapter. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research as well as other available research sources.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Section 14.5 of this chapter.

A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 5 of this EIA (Land, Soils, Geology and Hydrogeology).

14.1.2 Legislation and Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation and control, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended). European and national waste management policy is based on the concept of 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (Figure 14.1).



Figure 14.1 Waste Hierarchy (Source: European Commission)

EU and Irish National waste policy also aims to contribute to the circular economy by extracting high-quality resources from waste as much as possible. Circular Economy

(CE) is a sustainable alternative to the traditional linear (take-make-dispose) economic model, reducing waste to a minimum by reusing, repairing, refurbishing and recycling existing materials and products. (Figure 14.2).

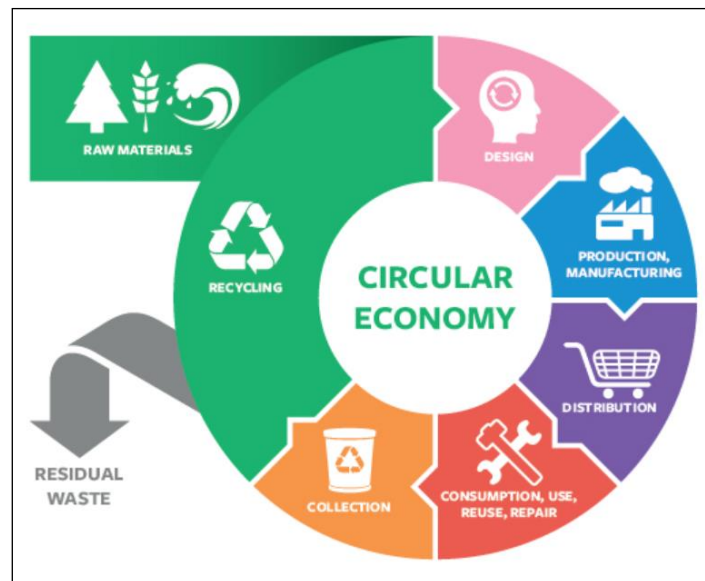


Figure 14.2 Circular Economy (Source: Repak)

The Irish government issues policy documents which outline measures to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document, Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland, was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan, A Resource Opportunity, in 2015.

One of the first actions to be taken from the WAPCE was the development of the Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021) to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021.

The strategy for the management of waste from the construction phase is in line with the requirements of the EPA's 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021). The guidance documents, Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects and Construction and Demolition Waste Management: A Handbook for Contractors and Site Managers (FÁS & Construction Industry Federation, 2002), were also consulted in the preparation of this assessment.

There are currently no Irish guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including the Eastern Midlands Region (EMR) Waste Management Plan 2015 – 2021, BS 5906:2005 Waste Management in Buildings – Code of Practice, the Wicklow County Council (WCC) County of Wicklow (Segregation, Storage and Presentation of Household and Commercial Waste) Byelaws 2018, the EPA National Waste Database Reports 1998 – 2019 and the EPA National Waste Statistics Web Resource.

14.2 RECEIVING ENVIRONMENT AND CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

14.2.1 Receiving Environment

In terms of waste management, the receiving environment is largely defined by Wicklow County Council (WCC) as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the Eastern Midlands Region Waste Management Plan 2015 – 2021. Currently the EMR and other regional waste management plans are under review and the Regional Waste Management Planning Offices expect to publish the final plan in 2022.

The EMR Waste Management Plan 2015-2021 sets out the following targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 55% of managed municipal waste by 2025; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The EMR Waste Management Plan sets out the strategic targets for waste management in the region and sets a specific target for construction and demolition (C&D) waste of “70% preparing for reuse, recycling and other recovery of construction and demolition waste” (excluding natural soils and stones and hazardous wastes) to be achieved by 2020. Ireland achieved 84% material recovery of such waste in 2019, and therefore surpassed the 2020 target and is currently surpassing the 2025 target. The National Waste Statistics update published by the EPA in November 2021 identifies that Ireland’s current target of “Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass (includes metal and plastic estimates from household WEEE)” was met for 2020 at 51%; however, they are currently not in line with the 2025 target (55%).

The Wicklow County Development Plan 2016-2022 and the Draft Wicklow County Development Plan 2022-2028 set out objectives for the WCC area which reflect those set out in the regional waste management plan.

In terms of physical waste infrastructure, WCC no longer operates any municipal waste landfills in the area. There are a number of waste permitted and licensed facilities located in the EMR Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, municipal waste landfills, material recovery facilities and waste transfer stations.

14.3 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development primarily comprises the construction of a 110 KV substation and underground grid connection.

A full description of the proposed development can be found in Chapter 2 (Description of the Proposed Development). The characteristics of the proposed development that are relevant in terms of waste management are summarised below.

Demolition Phase

There will be no structural demolition associated with the proposed development. There will be the removal of a small section of redundant overhead line cable associated with the installation of the 2 no. new masts. This will generate waste metals (including their alloys), mixed metals, iron and steel, and cable.

Construction Phase

During the construction phase, waste will be produced from surplus materials such as broken or off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated. The appointed Contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

It is estimated that c. 0.046 m³ of material will be excavated to facilitate the proposed development. The 110 kV Substation site requires a net fill of 22,091 m³. The recontouring of the 110 kV Substation lands will be undertaken as part of the ICT Facility permitted under WCC Reg. Ref.: 201088. The permitted ICT Facility required a net export of soil / stones. The proposed development will therefore utilise cut material from the ICT Facility site and will not require the importation of fill material.

If the material that requires removal from the site is deemed to be a waste, removal and reuse / recycling / recovery / disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery / disposal will dictate whether a Certificate of Registration (COR), permit or licence is required for the receiving facility. Alternatively, the material may be classed as by-product under Regulation 15 (By-products) (Previously Article 27 of the European Communities (Waste Directive) Regulations 2011) of S.I. No. 323/2020 - European Union (Waste Directive) Regulations 2020. For more information in relation to the envisaged management of by-products and waste, refer to the RWMP (Appendix 14.1).

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2019). Environmental soil analysis will be carried out prior to removal of the material on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste, including potential pollutant concentrations and leachability. It is anticipated that the surplus material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities / landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment / recovery or exported abroad for disposal in suitable facilities.

Waste will also be generated from construction phase workers e.g. organic / food waste, dry mixed recyclables (wastepaper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and, potentially, sewage sludge from temporary welfare facilities provided on-site during the

Construction phase. Waste printer / toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated in small volumes from site offices.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific RWMP (Appendix 14.1). The RWMP provides an estimate of the main waste types likely to be generated during the Construction phase of the proposed development. These are summarised in Table 14.1.

Table 14.1 Predicted on and off-site reuse, recycle and disposal rates for construction waste

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	44.0	10	4.0	80	35.0	10	4.0
Timber	37.0	40	15.0	55	21.0	5	2.0
Metals	13.0	5	4.0	90	8.0	5	1.0
Concrete	11.0	30	1.0	65	10.0	5	1.0
Other	8.0	20	2.0	60	5.0	20	0.0
Total	113.0		26.0		79.0		8.0

Operational Phase

Once operational, it is anticipated that very small amount of waste will be generated at the proposed GIS substation from ESB networks staff during their inspections and maintenance works. These wastes may include organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons) and non-recyclable waste. Waste fuels/oils, waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently.

14.4 POTENTIAL IMPACTS OF THE DEVELOPMENT

14.4.1 Construction Phase

The proposed development will generate a range of non-hazardous and hazardous waste materials during site excavation and construction (see Appendix 14.1 for further detail). General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored in the construction site compound or adjacent to it, on-site, pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the

absence of mitigation, the effect on the local and regional environment is likely to be **long-term, significant** and **negative**.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the EMR which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the development site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

There is a quantity of excavated material which will need to be excavated to facilitate the proposed development. It is estimated that c. 0.046 m³ of material will be excavated to facilitate the proposed development. The 110 kV Substation site requires a net fill of 22,091 m³. The recontouring of the 110 kV Substation lands will be undertaken as part of the ICT Facility permitted under WCC Reg. Ref.: 201088. The permitted ICT Facility required a net export of soil / stones. The proposed development will therefore utilise cut material from the ICT Facility site and will not require the importation of fill material. A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 5 (Land, Soils, Geology and Hydrogeology) It is anticipated that none of excavated material will need to be removed off-site. If material has to be removed correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

14.4.2 Operational Phase

There are no potential impacts from the operational phase of the proposed development in respect of Waste Management.

14.5 REMEDIAL AND MITIGATION MEASURES

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

The concept of the 'waste hierarchy' is employed when considering all mitigation measures. The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal.

14.5.1 Construction Phase

The following mitigation measures will be implemented during the construction phase of the proposed development.

As previously stated, a project specific RWMP has been prepared in line with the requirements of the requirements of The EPA, *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition*

Projects' (2021) and is included as Appendix 14.1. The mitigation measures outlined in the RWMP will be implemented in full and form part of mitigation strategy for the site. The mitigation measures presented in this RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (Appendix 14.1) in agreement with WCC and in compliance with any planning conditions, or submit an addendum to the RWMP to WCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will implement the RWMP throughout the duration of the proposed excavation and construction phases.

It has been calculated by the project design team that all of excavated material will be reused on site. If any material has to be removed offsite then correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
 - Concrete rubble (including ceramics, tiles and bricks);
 - Metals;
 - Glass;
 - Hazardous material; and
 - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible; (alternatively, the waste will be sorted for recycling, recovery or disposal);
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A Resource Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed development is dealt with in compliance with the provisions of

the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, and the EMR Waste Management Plan 2015 – 2021. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

14.5.2 Operational Phase

There will be no mitigation measures required for the operational phase of this development as no operational waste will be generated.

14.6 PREDICTED IMPACT OF THE PROPOSED DEVELOPMENT

The implementation of the mitigation measures outlined in Section 14.5 and in Appendix 14.1 will ensure that high rates of reuse, recovery and recycling are achieved at the Site of the proposed development during the construction phase. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

14.6.1 Construction Phase

A carefully planned approach to waste management as set out in Section 14.5.1 and adherence to the RWMP (which includes mitigation) (Appendix 14.1) during the construction phase will ensure that the predicted effect on the environment will be ***short-term, imperceptible and neutral.***

14.6.2 Operational Phase

There will be no predicted impacts during the operational phase as no operational waste will be generated.

14.7 MONITORING AND/OR REINSTATEMENT

The management of waste during the construction phase will be monitored by the contractor's appointed Resource Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation.

14.7.1 Construction Phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the demolition, excavation and construction works where there is a potential for waste management to become secondary to progress and meeting construction schedule targets. The mitigation measures in the RWMP specifies the need for a Resource Manager (RM) to be appointed who will have responsibility to monitor the actual waste volumes being generated and to ensure that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the waste manager will identify the reasons for targets not being achieved and work to resolve any issues. Recording of waste generation during the project will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future projects.

14.7.2 Operational Phase

There will be no monitoring required for the operational phase as no operational waste will be produced.

14.8 CUMULATIVE IMPACT

The potential for cumulative impact (as far as practically possible) of the Proposed Development with any/all relevant planned, existing or permitted developments as set out in Chapter 2, Section 2.8 and 2.9 of the EIAR, unless otherwise stated. The likelihood of cumulative effects are discussed in Sections 14.8.1 and 14.8.2 below for construction and operational phases.

As has been identified in the receiving environment section all cumulative developments that are already built and in operation contribute to our characterisation of the baseline environment. As such any further environmental impacts that the proposed development may have in addition to these already constructed and operational cumulative developments has been assessed in the preceding sections of this chapter.

14.8.1 Construction Phase

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase.

A review of the existing projects within the vicinity of the site and the projects set out in Chapter 2, Section 2.8 and 2.9 of the EIAR has identified the only simultaneous construction projects capable of combining with the Permitted Development is the Permitted ICT Facility WCC Reg. Ref. 20/1088. Additionally, there is the potential for the Proposed Development to combine with the construction phase of the Biofuel Facility proposed under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181).

Permitted ICT Facility WCC Reg. Ref. 20/1088; is subject to the Environmental Impact Assessment Report and planning conditions which include appropriate mitigation measures to minimise environmental impacts. Furthermore, Condition 8 of WCC Reg. Ref. 20/1088 requires the works contractor to provide a detailed Construction Environmental Management Plan (CEMP) for the Permitted ICT Facility. The CEMP for the Permitted ICT Facility will ensure that this project will be managed in a safe and organised manner by the Contractor, Condition 7 of WCC Reg. Ref. 20/1088 requires that all mitigation measures, including those relating to waste management, identified in the Environmental Impact Assessment Report submitted with the application, shall be implemented in full.

The proposed Biofuel Facility under WCC Reg. Ref. 21.677 (Subject to Appeal PL27.312181) is similarly; subject to an Environmental Impact Assessment Report which includes appropriate mitigation measures to minimise environmental impacts. The proposed Biofuel Facility application included an outline Construction Management Plan (CMP) and a Construction & Demolition Waste and By-Product Management Plan (C&D WMP). The CMP for the proposed Biofuel Facility will ensure that this project will be managed in a safe and organised manner by the Contractor. Adherence to the C&D WMP will ensure that waste arising from the construction phase

of the development will be managed in accordance with relevant legislation and best practice guidelines.

While there is the potential for cumulative impacts between the Proposed Development and the proposed Biofuel Facility during a simultaneous construction phase; the effect is considered to be **neutral, imperceptible, and temporary** in duration (due to the duration of the construction works of the Proposed Development and the proposed Biofuel Facility lasting no more than 12 months).

Due to the high number of waste contractors in the Wicklow region as provided from the National Waste Collection Permit Office and the Environmental Protection Agency there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management.

With the implementation of mitigation measures to protect soil and water quality in compliance with legislative standards the residual cumulative effect on land, soils, geology and hydrogeology of the Proposed Development in combination with other relevant planned, existing or permitted developments is considered to be **neutral, imperceptible, and temporary** in duration (due to the duration of the construction works of the Proposed Development and the proposed Biofuel Facility lasting no more than 12 months).

14.8.2 Operational Phase

There is no potential for cumulative impacts associated with the operational phase as no regular operational waste will be produced.

14.9 REFERENCES

- Waste Management Act 1996 (No. 10 of 1996) as amended.
- BS 5906:2005 Waste Management in Buildings – Code of Practice.
- Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.
- Department of Communications, Climate Action and Environment (DCCAE), Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (2020).
- Department of Environment and Local Government (DELG) (1998). Waste Management – Changing Our Ways, A Policy Statement.
- Department of Environment, Communities and Local Government (DECLG) (2012). A Resource Opportunity - Waste Management Policy in Ireland.
- Wicklow County Council (WCC) County of Wicklow (Segregation, Storage and Presentation of Household and Commercial Waste) Bye-laws, 2018.
- WCC, Wicklow County Development Plan 2016-2022 (2016).
- WCC, Draft Wicklow County Development Plan 2022-2028 (2022).
- Department of Environment, Heritage and Local Government (DEHLG) (2020). Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities.
- Environmental Protection Agency (EPA) 'Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects' (2021).
- Department of Environment, Heritage and Local Government (DEHLG) (2006). Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects.
- Eastern Midlands Regional Waste Management Plan 2015-2021 (2015).
- Environmental Protection Agency (EPA). National Waste Database Reports 1998-2019.
- EPA (2015). Waste Classification-List of Waste & Determining if Waste is Hazardous or Non-Hazardous.
- EPA and Galway-Mayo Institute of Technology (GMIT) (2015). EPA Research Report 146-A Review of Design and Construction Waste Management Practices in Selected Case Studies-Lessons Learned.
- FÁS and the Construction Industry Federation (CIF) (2002). Construction and Demolition Waste Management-a handbook for Contractors and Site Managers.
- Forum for the Construction Industry-Recycling of Construction and Demolition Waste.
- Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended.
- Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended.
- Environmental Protection Agency Act 1992, as amended.
- European Commission, Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (2017).
- Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2022)

15.0 INTERACTIONS

15.1 INTRODUCTION

This chapter has been produced following the guidance within the EIA Directive, the *Planning and Development Act 2000* (as amended), the *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022) and EPA *Draft Advice Notes for Preparing Environmental Impact Statements* (EPA, 2015).

In accordance with the guidance not only are the individual significant impacts required to be considered when assessing the impact of a development on the environment, but so must the interrelationships between these factors be identified and assessed.

The majority of the EIA Report chapters have already included and described assessments of potential interactions between aspects, considered by the various specialists contributing to this impact assessment. The quality, magnitude and duration of potential impacts are defined in accordance with the criteria provided in the EPA 2017 Guidance as outlined in Chapter 1 (Introduction). This section of the assessment presents a summary and assessment of the identified interactions.

Section 171A of the Planning and Development Act requires that the interactions between the following be assessed:

- Population and human health;
- Land, soil, water, air and climate;
- Biodiversity, with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive; and
- Material assets, cultural heritage, and the landscape.

15.2 DISCUSSION – POSITIVE IMPACTS

The reasoning behind the interactions that are considered to have a positive effect (i.e. a change which improves the quality of the environment) is outlined in this section.

15.2.1 Population and Human Health and:

Archaeological, Architectural and Cultural Heritage

Archaeological assessment for the Proposed Development has not identified features of archaeological interest on the site. However, sub-surface features relating to the former chapel and graveyard site of Killynee, immediately to the northwest of the Proposed Development may survive sub-surface. The ability to excavate these sites through the construction phase will provide data to the archaeological community from the potential subsurface sites. The potential to gain knowledge outweighs the negative impact. And the mitigation measures detailed Chapter 11 (Archaeological, Architectural and Cultural Heritage) will ensure that the effect is **long-term, imperceptible** and **positive**.

15.3 DISCUSSION – NEUTRAL IMPACTS

The reasoning behind the interactions that are considered to have a neutral effect (i.e. no effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error) is outlined in this section.

15.3.1 Population and Human Health and:

Land, Soils, Geology and Hydrogeology

There will be a loss of soil available for agricultural use due to the development. However, within the overall context of Ireland's available farmland, the loss is considered negligible. The employment created by the construction and operation of the Proposed Development counterbalances this economic loss to some extent.

Treated wastewater (package wastewater treatment system and a sand polishing filter) will be discharged to ground through a gravel bed filtration system. The proposed system is not anticipated to impact on domestic wells or any groundwater protection areas. The impact is **long-term, imperceptible** and **neutral**.

Hydrology

The Proposed Development represents a minor increase in hardstand, the proposed sustainable drainage measures in the permitted ICT Facilities (WCC Reg. Ref. 201088) and flood risk assessment undertaken demonstrates that the development will not result in offsite flooding or impact on surface water flows in the local area.

There are no other interactions. The effect is considered to be **long-term, imperceptible** and **neutral**.

Noise and Vibration

The potential interaction of noise on the local population is discussed in Chapter 4 (Population and Human Health) and Chapter 9 (Noise and Vibration). The predicted change in noise levels associated with additional traffic for the construction of the Proposed Development is expected to be **neutral, imperceptible**, and **temporary** along the existing road network. Any change in noise levels associated with Building Services and Plant during the operational phase are expected to be **neutral, imperceptible**, and **long-term**.

Material Assets, including Transport and Waste

The Proposed Development will have an impact on material assets such as surface water drainage, water supply, wastewater drainage, power supply and road infrastructure. The individual chapters of this EIA Report (Chapter 12 (Traffic and Transportation) and Chapter 13 (Material Assets)) have assessed the capacities of the available infrastructure to accommodate the Proposed Development and the implementation of the mitigation measures proposed in these chapters will ensure there are no residual negative impacts on the local population. The predicted effect is therefore **imperceptible to not significant** and **neutral**.

Hydrocarbon interceptors will treat the surface water run-off from the Proposed Development. This waste stream will be managed in accordance with the relevant legislation identified in Chapter 14 (Waste Management) such that the effect of the construction phase waste generation will be **short-term, imperceptible** and **neutral**.

The potential impacts on human beings are in relation to incorrect management of waste during construction phase, which could result in littering and presence of vermin – with associated potential for negative impacts on human health. A carefully planned approach to waste management and adherence to the project specific RWMP (Appendices 14.1) will ensure appropriate management of waste and avoid any negative impacts on the local population. The effects should be **long-term, imperceptible** and **neutral**.

Landscape and Visual Impact

The number and distribution of potential visual receptors in the receiving environment, and their degree of exposure to the site, is relatively limited. Nonetheless, there are a small number of residential properties in the area of the proposed pylons which are exposed to the site and would unavoidably experience some reduction in visual amenity as a result of the development. The development would cause a shift in landscape character, from the current peri-urban condition towards employment-dominated urban, which may impact on Population and Human Health.

It is important to note that this effect is an inevitable result of the site's zoning in the Arklow LAP and is a realisation of the development strategy for the area.

Overall the interactions between Landscape and Visual Impact & Population and Human Health are **slight, neutral**.

15.3.2 Land, Soils, Geology and Hydrogeology and:

Hydrology

The main potential impact of the construction works proposed is on surface water quality (due to sediment laden run-off, material spillages) and groundwater quality (due to removal of protective soil) in the environs of the construction area; however, the implementation of a CEMP as detailed in Chapter 6 (Hydrology) will ensure the effect will be **short-term, imperceptible**, and **neutral**.

The main potential impact of the operational phase of the Proposed Development on surface water, soil and groundwater quality is accidental leaks and spillages of fuels from vehicles along access roads and in parking areas. However, with the implementation of comprehensive emergency response procedures and standard operating procedures to respond to chemical spillage and training, the effect will be **long-term, imperceptible**, and **neutral**.

Biodiversity

The construction phase will result in land disturbance during cut and fill activity that may impact on indigenous flora and fauna. Appropriate mitigations have been implemented to reduce the impact on indigenous flora and fauna which will be **neutral, short term**, and **imperceptible**.

Although the operational phase will alter the existing agricultural habitat to a built environment, it is not envisioned that there will be any long-term impact on overall biodiversity. Appropriate mitigations have been implemented to reduce the impact on indigenous flora and fauna. The development is located in an area of low local ecological value and, as such, is predicted to have a **neutral** and **imperceptible** effect on biodiversity.

Material Assets, including Transport and Waste

During the construction phase, c. 0.046 m³ of material will be excavated to facilitate the Proposed Development. The 110 kV Substation site requires a net fill of 22,091 m³. The recontouring of the 110 kV Substation lands will be undertaken as part of the ICT Facility permitted under WCC Reg. Ref.: 201088. The permitted ICT Facility required a net export of soil / stones. The Proposed Development will therefore utilise cut material from the ICT Facility site and will not require the importation of fill material.

If material has deemed unsuitable or is unable to be reused onsite it will be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 5 (Land, Soils, Geology and Hydrogeology) and the requirements of the RWMP (Appendix 14.1), will ensure the effect is **long-term, imperceptible** and **neutral**.

15.3.3 Hydrology and:

Biodiversity

Mitigation measures will be in place during construction and operation to ensure that any accidental emissions to the local environment are controlled.

The Proposed Development will result in increased surface water run-off. Any surface water run-off will be attenuated to the greenfield runoff rate. The proposed sustainable drainage measures include hydrocarbon interceptors, and off-site attenuation storage and flow control device will ensure emissions are treated and controlled.

There is no direct connectivity to any national or internationally designated sites. The predicted effect will be **neutral, imperceptible**, and **long-term**.

Air Quality and Climate

Mitigation measures implemented during the construction phase will ensure that the deposition of dust is minimised and therefore the predicted effect from air (including dust) on the hydrological environment during construction is **short-term, imperceptible** and **neutral**.

Land, Soils, Geology and Hydrogeology

As there is potential for silt laden run-off to enter current drainage ditch systems and discharge to a watercourse, mitigations will be put in place to manage run-off during the construction phase. Run-off water containing silt will be contained on site via settlement tanks and treated to ensure adequate silt removal. Silt reduction measures on site will include a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds). The effect will be **short-term, imperceptible**, and **neutral**.

There are no significant surface watercourses on the site so there will be no impact on the natural hydrological regime from the addition of hardstanding across the site. Any surface water run-off will be attenuated to the greenfield runoff rate.

Material Assets, including Transport and Waste

Hydrocarbon interceptors will treat the surface water run-off from the Proposed Development. This waste stream will be managed in accordance with the relevant

legislation identified in Chapter 14 (Waste Management) such that the effect of the construction phase waste generation will be **short-term, imperceptible** and **neutral**. No operational waste will be generated so there will be no impact during the operational phase.

The Proposed Development will result in changes to surface water drainage, water supply and wastewater networks. However, a combination of mitigation measures to be implemented as detailed in Chapter 6 (Hydrology), as well as the capacity already built into these networks, will ensure that these changes will result in a **long-term, imperceptible** and **neutral** impact.

15.3.4 Biodiversity and:

Air Quality and Climate:

There is a potential for the construction activity to impact on air quality in terms of dust generated but mitigation measures outlined in both Chapter 5 (Land, Soils, Geology & Hydrogeology) and Chapter 8 (Air Quality & Climate) of this EIA Report, implemented through the CEMP, will ensure that the impact on biodiversity is **short-term, neutral and imperceptible**.

Landscape and Visual

There will be a minor loss of hedgerow and modified grassland habitats as part of the Proposed Development during the construction phase. The operational development and the implementation of the landscaping proposals set out will result in an overall **neutral** interaction.

15.3.5 Traffic and Transportation and:

Material Assets, including Waste

Local traffic and transportation will be impacted by the additional vehicle movements generated by removal of waste from the site during the construction phase of the proposed Development. The increase in vehicle movements as a result of waste generated during the construction phase will be temporary in duration. Traffic-related impacts during the construction phase are addressed in Chapter 12 (Traffic and Transportation). Provided the mitigation measures detailed in Chapter 12 are adhered to, the predicted effects are **short** to **long-term, imperceptible** and **neutral**.

15.4 DISCUSSION – NEGATIVE IMPACTS

The reasoning behind the interactions that are considered to have a negative effect (i.e. a change which reduces the quality of the environment) is outlined in this section.

15.4.1 Population and Human Health and:

Air Quality and Climate

An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the Proposed Development during the construction stage will ensure that the impact of the Proposed Development complies with all ambient air quality legislative limits and therefore the predicted impact is **short-term, negative,**

direct and **imperceptible** with respect to population and human health. Operational phase impacts will be **neutral** and **imperceptible**.

Noise and Vibration

The potential interaction of noise on the local population is discussed in Chapter 4 (Population and Human Health) and Chapter 9 (Noise & Vibration). During the construction phase of the Proposed Development there will be some impact on nearby noise sensitive properties due to noise emissions from construction activities. The application of noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum. Any construction noise impacts associated with the substation construction will be **slight, negative** and **temporary** in nature. Noise impacts associated with the grid connection route construction will be **significant, negative** and **brief** in nature

15.4.2 Biodiversity and:

Noise and Vibration

Noise and vibration generated during the construction phase of the Proposed Development will have a **brief to temporary, negative** impact on fauna which are likely to be displaced during construction works.

15.4.3 Air Quality and Climate and:

Material Assets, including Transport and Waste

Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the Proposed Development on air quality and climate are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality and climate are considered to be **imperceptible**.

15.5 SUMMARY

In summary, the interactions between the environmental factors and impacts discussed in this EIA Report have been assessed and the majority of interactions are neutral.

There are no significant negative impacts predicted from the interactions of the constituent elements of the Proposed Development when viewed in the light of their associated mitigation measures.

15.6 TABLE OF INTERACTIONS

Table 15.1 Summary of interrelationships Between the Aspects

	Population & Human Health		Land, Soils and Hydrogeology		Hydrology		Biodiversity		Air Quality and Climate		Noise and Vibration		Landscape and Visual Impact		Cultural Heritage		Material Assets, including Transport and Waste	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
Planning and Alternatives	+	+	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Population & Human Health			o	o	o	o	X	X	-	-	-	o	o	o	+	o	o	o
Land, Soils and Hydrogeology					o	o	o	o	X	X	X	X	X	X	o	o	o	o
Hydrology							o	o	o	X	X	X	X	X	X	X	o	o
Biodiversity									o	X	-	X	o	o	X	X	X	X
Air Quality and Climate											X	X	X	X	X	X	-	-
Noise and Vibration													X	X	X	X	X	X
Landscape and Visual Impact															o	o	X	X
Cultural Heritage																	X	X
Material Assets, including Transport and Waste																		

Con.	Construction Phase	+	Positive Interaction
Op.	Operational Phase	o	Neutral Interaction
X	No Interaction	-	Negative Interaction